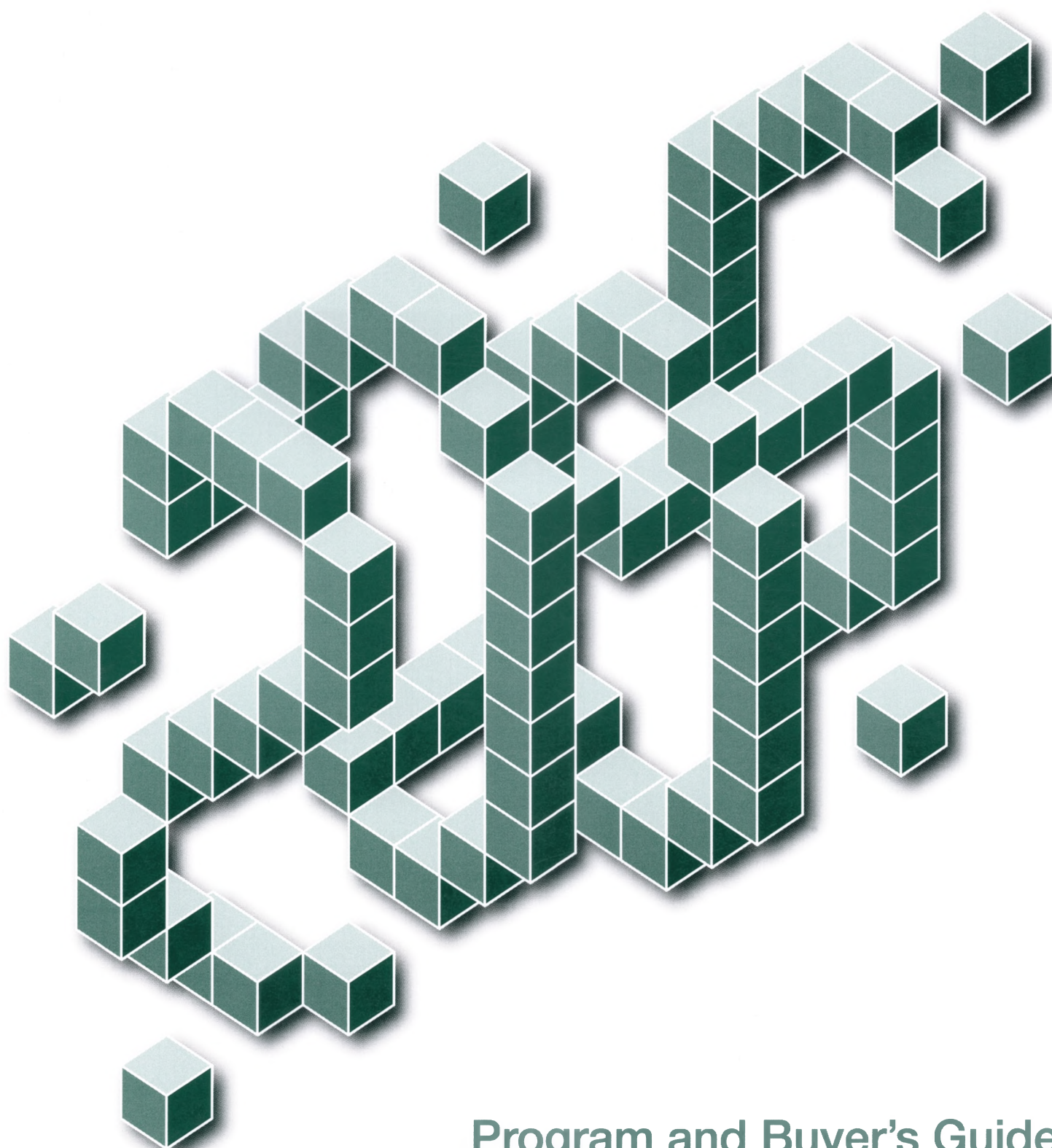




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Conference at a Glance

SIGGRAPH 2006 Conference
Registration Categories:

- Full Conference
- Conference Select
- Exhibits Plus

	SAT, 29 JULY	SUN, 30 JULY	MON, 31 JULY	TUES, 1 AUG	WED, 2 AUG	THU, 3 AUG
Registration	6 – 8 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 3:30 pm
Merchandise Pickup	6 – 8 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 3:30 pm
SIGGRAPH Store	6 – 8 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm
●●○ Exhibition				9:30 am – 6 pm	9:30 am – 6 pm	9:30 am – 3:30 pm
PRESENTATIONS						
● Courses		8:30 am – 5:30 pm	8:30 am – 5:30 pm	8:30 am – 5:30 pm	8:30 am – 5:30 pm	
● Papers			8:30 am – 6 pm	8:30 am – 5:30 pm	8:30 am – 6 pm	8:30 am – 5:30 pm
●● Panels			3:45 – 5:30 pm	10:30 am – 5:30 pm	10:30 am – 12:15 pm & 3:45 – 5:30 pm	
●● Sketches			10:30 am – 12:15 pm & 3:45 – 5:30 pm	8:30 am – 5:30 pm	8:30 am – 5:30 pm	8:30 am – 5:30 pm
●●○ Research Posters		8:30 am – 5:30 pm	8:30 am – 5:30 pm	8:30 am – 5:30 pm	8:30 am – 5:30 pm	8:30 am – noon
●● Educators Program					8 am – 6 pm	8 am – 5 pm
●●○ Keynote Address/Awards			1:15 – 3:15 pm			
●● Special Sessions						
Plugged In			4:45 – 6:45 pm			
Vroom Vroom				4:45 – 6:45 pm		
20,000 Bits Under the Sea					1:45 am – 3:45 pm	
Sounding Off					4:45 – 6:45 pm	
●●○ Special Events						
Fast-Forward Papers Preview		6 – 8 pm				
ACM Student Research Competition Presentations				10:30 am – 12:15 pm		
Fashion Show 2006			10 – 11 pm			
LEGO Mindstorms: The Next Generation					5 – 6:30 pm	
●●○ Exhibitor Tech Talks				9:30 am – 6 pm	9:30 am – 6 pm	9:30 am – 3:30 pm
EXPERIENCES						
●●○ Art Gallery		1 – 6 pm	9 am – 6 pm	9 am – 6 pm	9 am – 6 pm	9 am – 5 pm
Computer Animation Festival						
● Electronic Theater			7 – 9 pm	7 – 9 pm	7 – 9 pm	
●● Electronic Theater Matinée				1:30 – 3:30 pm	1:30 – 3:30 pm	
●●○ Animation Theaters		1 – 6 pm	9 am – 6 pm	9 am – 6 pm	9 am – 6 pm	9 am – 5 pm
●●○ Emerging Technologies		1 – 6 pm	9 am – 6 pm	9 am – 6 pm	9 am – 6 pm	9 am – 5 pm
●●○ Guerilla Studio		1 – 6 pm	9 am – 6 pm	9 am – 6 pm	9 am – 6 pm	9 am – 5 pm
● Reception					8 – 10 pm	
SERVICES						
●●○ Birds of a Feather	Throughout the week					
●●○ Get Involved				5 – 6:30 pm		
●●○ International Resources	6 – 8 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 5 pm
●●○ Job Fair				10 am – 4 pm	10 am – 4 pm	10 am – 4 pm
●●○ Pathfinders	6 – 8 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 6 pm	8 am – 2 pm

Welcome to SIGGRAPH 2006

The SIGGRAPH 2006 committee is proud to present **a revolutionary experience** in interactive techniques, human-computer interfaces, and computer graphics research and applications. And Boston is ready to entertain and enlighten the worldwide SIGGRAPH community.

This attendee guide to SIGGRAPH 2006 summarizes five full days of extraordinary events, sessions, and experiences. It's your essential source of information for planning your personal schedule in Boston. If our schedules don't intersect at other times during the week, I'm hoping to see you at my three favorite highlights:

- **Keynote Address**

From Myth to Mountain: Insights Into Virtual Placemaking, by Joe Rohde, Executive Designer and Vice President, Walt Disney Imagineering.

- **Electronic Theater Pre-Show**

The world's largest Etch-A-Sketch, an interactive video game for 2,000 players.

- **Beyond Boundaries: Charles A. Csurí (1963 – present)**

The first extensive retrospective by the father of computer art and animation.

Everything here was selected, organized, and produced by a group of exceptionally smart and creative volunteers from around the world: the SIGGRAPH 2006 committee. I am deeply indebted to all of them for their generosity, energy, patience, and persistence. But they could not present this revolutionary experience without the amazing work that was submitted by thousands of contributors from the international SIGGRAPH community and the hundreds of organizations who are showing their products and services in the SIGGRAPH 2006 Exhibition. And they would not be here if you were not here.

Many, many thanks to all of you. And best wishes for a successful, adventurous, and memorable week at SIGGRAPH 2006!

John C. Finnegan

SIGGRAPH 2006 Conference Chair
Purdue University

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create
BOSTON

- Full Conference
- Conference Select
- Exhibits Plus

Presentations

● Courses

Sunday – Wednesday, 30 July – 2 August

Interdisciplinary instruction by experts from academia and industry who demonstrate the latest techniques, analyze complex algorithms and their implementations, and accelerate understanding of the core concepts in computer graphics and interactive techniques. Courses are presented as brief tutorials, half-day sessions, and intensive full-day sessions. Complete list of Courses, pages 8 – 37.

●●○

SIGGRAPH 2006 Keynote: Joe Rohde

Monday, 31 July, 1:15 – 3:15 pm
Hall C



Joe Rohde, Executive Designer and Vice President with Walt Disney Imagineering, presents the SIGGRAPH 2006 keynote address "From Myth to Mountain: Insights Into Virtual Placemaking." Rohde is the

lead designer of Disney's Animal Kingdom and is responsible for driving the vision for the theme park. He was the principal creative force behind the just-opened Expedition Everest attraction.

In the same session, ACM SIGGRAPH presents the following awards for significant achievements in the field:

Computer Graphics Achievement Award
Tom Sederberg
Brigham Young University

Significant New Researcher Award
Takeo Igarashi
The University of Tokyo

Outstanding Service Award
John Fujii
Hewlett Packard Company

● Papers

Monday – Thursday, 31 July – 3 August
Hall B2, Hall C

Interdisciplinary research achievements in the world's most prestigious presentation of current work in computer graphics and interactive techniques. Academic and industry investigators explain their ground-breaking, provocative, and important new work. After their talks, most authors are available for informal discussion of their work and its implications. Complete list of Papers, pages 38 – 50.

●●

Panels

Monday – Thursday, 31 July – 3 August
Rooms 157, 210, 253

Interrogate the experts and disagree with their detractors. Panelists present brief statements about the issues that energize the computer graphics community, debate the topics, and answer questions from the audience. Complete list of Panels, pages 51 – 53.

●●

Sketches

Monday – Thursday, 31 July – 3 August

Interlace with current research findings and speculative directions in all sub-disciplines of computer graphics and interactive techniques. Scientists, artists, designers, engineers, and visual effects innovators present brief, illustrated talks on their current work. Following each sketch presentation, authors answer questions and discuss future directions. Complete list of Sketches, pages 54 – 71.

●●

Educators Program

Wednesday – Thursday, 2– 3 August
Room 156 and 157

Intersect with research, methods, and techniques in every aspect of education at every level. Educators and learners present research, summarize projects, and debate approaches in papers, panels, forums, and quicktakes. Complete list of Educators Program, pages 81 – 91.

●●○

Research Posters

Sunday – Thursday, 30 July – 3 August
Main Lobby

Interpersonal encounters with incremental, preliminary, partial, and innovative insights that are important but don't comprise a full paper by themselves. Posters are displayed throughout the conference week. In scheduled sessions, poster presenters discuss their work and answer questions. Complete list of Research Posters, pages 72 – 80.

●●○

Exhibitor Tech Talks

Hall A

Interconnect with this year's breakthrough hardware and software. SIGGRAPH 2006 exhibitors demonstrate the systems you need for another year of achievement in computer graphics and interactive techniques. After the sessions, company experts are available for one-on-one conversations about specific questions and applications. List of Exhibitor Tech Talks, page 165.

●●○

Special Events

Fast-Forward Papers Preview

Sunday, 30 July, 6 – 8 pm
Hall C

Snapshot overviews of the paper sessions, in which authors give short summaries of their work. It's a fast, fun, and provocative preview of the latest and most significant findings in computer graphics and interactive techniques.

Fashion Show 2006

Monday, 31 July, 10 – 11 pm
The Roxy
279 Tremont Street

A runway show featuring the latest convergence of mobile technology and conceptual couture: streetwear and casual, functional garments of innovative materials, fabrication, and design.



Special Events

ACM Student Research Competition Presentations

Tuesday, 1 August, 10:30 am – 12:15 pm
Room 157

Winners of the ACM Student Research Competition at SIGGRAPH 2006 present brief summaries of the work they are displaying in the Research Posters program.

LEGO Mindstorms: The Next Generation

Wednesday, 2 August, 5 – 6:30 pm
Room 155

Come see what the world's most innovative robot hobbyists have created with LEGO Mindstorms NXT, the next generation in robot construction kits.

Mitchel Resnick
Massachusetts Institute of Technology Media Lab



Special Sessions

Intermixture of advanced design, engineering breakthroughs, and deep interactivity. In Special Sessions, leading explorers demonstrate recent achievements in ocean exploration, vehicle performance and marketing, interactive performance, and character animations.

Josh Strickon
The New York Times Company
Special Sessions Chair

Plugged In: Creating Emotional Responses Through the Use of Entertainment Technology in Live Performance

Monday, 31 July, 4:45 – 6:45 pm
Hall B2

New technologies are influencing the design of performance spaces, spectacles and events. From fireworks displays and fountains to computer graphics and parades, live performance is evolving. In this session, designers, programmers, and producers reveal the evolution of live performance.

Moderator
Tom Craven
The Walt Disney Company (retired)

Panelists
Don Dorsey
Dorsey Productions, Inc.

Marc Downie
The OpenEnded Group

Tony Freitas
Wet Design

David Hynds
Walt Disney World Ride & Show Engineering

Vrooom Vrooom: SIGGRAPH at 500 Horsepower

Tuesday, 1 August, 4:45 – 6:45 pm
Hall B2

Attendees, start your graphics engines! Cars are now communication devices, entertainment centers, and social statements. From video games and movies to research labs and design centers, cars are evolving faster than ever.

Moderator
Phil Patton
The New York Times

Panelists
Ryan Chin
Smart Cities Group, Massachusetts Institute of Technology Media Lab

Tim Milliron
Pixar Animation Studios

Gary Schultz
Pixar Animation Studios

Eddie Sotto
Sotto Studios/LA

Frans von Holzhausen
Mazda, North American Operations

Andy Wheel
Land Rover

SIGGRAPH 2006 Conference Registration Categories:

- Full Conference
- Conference Select
- Exhibits Plus

20,000 Bits Under the Sea: How Robotics, Visualization, and Scientific Computing Are Changing the Way We Explore, Discover, and Understand Our Oceans

Wednesday, 2 August, 1:45 – 3:45 pm
Hall B2

Oceans cover more than 70% of our planet, yet more is known about outer space. Computer graphics, robotics, user-interface design, visualization, and scientific computing are changing how oceanographers explore the deep.

Moderator
Kurt Schwehr
University of New Hampshire

Panelists
Alan D. Chave
Woods Hole Oceanographic Institution/
Deep Submergence Laboratory

Graham Hawkes
Hawkes Ocean Technologies

Chris Henze
NASA Advanced Supercomputing Division

Chris Hill
Massachusetts Institute of Technology, Department of Earth, Atmospheric, and Planetary Sciences

Sounding Off: How Voice Talents Bring Characters to Life in CG Film

Wednesday, 2 August, 4:45 – 6:45 pm
Hall B2

Voice casting, recording, and animation are an integral part of CG character development. Join this exploration of how major studios and talents use different approaches and techniques to integrate voice performance with computer graphics to create emotionally resonant computer-generated characters and stories.

Moderator
David Goelz

Panelist
Jim Bresnahan
Peter DeSeve
Lori Forte
Blue Sky Studios

Mary Hildalgo
Sony Pictures Animation

Kevin Reher
Pixar Animation Studios

- Full Conference
- Conference Select
- Exhibits Plus

Experiences



Art Gallery: *Intersections*

Sunday – Thursday, 30 July – 3 August
Hall B1

Intersect with art that explores new territories, crosses traditional boundaries, provokes thought, reveals ideas in innovative ways, and addresses contemporary issues. *Intersections* features 2D, 3D, and 4D wall-hung works, sound art, installation art, art animations, and screen-based work from throughout the world. *Intersections* also includes presentations of theoretical art papers, digital art panels, and art sketches (short presentations).

Electronically Mediated Performances

Enjoy international performances that utilize technology to create multi-sensory experiences that amaze, amuse, and dazzle the audience on multiple levels. The performances include dance, theater, music, performance art, and hybrid forms that merge various disciplines.

Charles A. Csuri

Explore this extensive retrospective exhibition featuring Csuri's art from 1963 to the present, including his first plotter drawing, real-time animations, newly rediscovered works from the early period, recent examples from the Infinity Series, and more. Csuri is recognized as the father of digital art and computer animation by Smithsonian Magazine and as a leading pioneer of computer animation by the Museum of Modern Art.

Computer Animation Festival



Animation Theaters

Sunday – Thursday, 30 July – 3 August
Room 104 and 107



Electronic Theater

Monday – Wednesday, 31 July – 2 August
Grand Ballroom



Electronic Theater Matinée

Tuesday – Wednesday, 1 – 2 August
Grand Ballroom

Interweave your senses with this year's finest film and video achievements by the world's most creative scientists, entertainers, superstars, vagabonds, studios, and students. The Computer Animation Festival presents selected works in the Electronic Theater (matinée and evening shows) and the Animation Theater (throughout the week).

The Computer Animation Festival jury selected two award winners from 726 entries for exemplary use of computer-generated imagery and animation, and compelling storytelling. For the past two years, the Best of Show recipient has been a nominee for an Academy Award.

SIGGRAPH 2006 Computer Animation Festival award winners:

One Rat Short (Best of Show)

Alex Weil

Charlex
United States

458nm (Special Jury Honors)

Jan Bitzer, Ilija Brunck, Tom Weber

Filmakademie Baden-Württemberg
Germany



Emerging Technologies

Sunday – Thursday, 30 July – 3 August
Hall B1

Interact with the interplay between humans and digital systems. Emerging Technologies demonstrates the future of interactive techniques in scientific visualization, robotics, medicine, biotechnology, music, audio, entertainment, fountains, services for the disabled, graphics, displays, haptics, sensors, gaming, the web, artificial intelligence, visualization, collaborative environments, design, aerospace, the military, and the fusion of technology and art.



Guerilla Studio

Sunday – Thursday, 30 July – 3 August
Room 52

Interdependent networks of hands-on technologies and creative concepts that embrace collaboration, determination, change, evolution, and innovation as essential elements in the birth of new modes of thinking and creating. The Guerilla Studio facilitates the realized, and sometimes unrealized, dreams of SIGGRAPH 2006 attendees. In 2D, 3D, 4D, and n-dimensional media.

Services



Reception

Seaport World Trade Center
200 Seaport Boulevard
Wednesday, 2 August, 8 – 10 pm

Intermingle with the international computer graphics community in its biggest social event of the year. Bring your business cards. SIGGRAPH 2006 provides food, beverages, and a beautiful harborside location that's perfect for social networking.

Sponsored by Intel Corporation
With support from Hewlett-Packard
Company, Dell Inc., BOXX Technologies,
IBM Corporation



The Teapot as Object and Icon

Sunday – Thursday, 30 July – 3 August
Hall B Lobby

Intertwine with real teapots, virtual teapots, and teapot-inspired images that showcase the long association of the teapot with computer graphics, art, and Boston. The teapot exhibit includes juried and curated work by computer scientists, artists, and designers from around the world.



Birds of a Feather

Interconnect with others who share your interests, goals, technologies, environments, or backgrounds, attend a Birds of a Feather event.



Get Involved

Tuesday, 1 August, 5 – 6:30 pm
Room 159

Interview the volunteers who organize the annual SIGGRAPH conference and discover how you can contribute your expertise and energy. All attendees, exhibitors, and presenters are invited. All questions and comments are welcome.



International Resources

Sunday – Thursday, 30 July – 3 August
Hall B Lobby

Intercontinental collaboration and socializing with attendees from all over the world. The International Center connects colleagues and friends worldwide; offers informal translation services; provides space for meetings, talks, and demonstrations; and organizes guided bilingual tours of several SIGGRAPH 2006 programs. See page 155 for the International Committee listing.



Job Fair

Tuesday – Thursday, 1 – 3 August
10 am – 4 pm
Hall B1

The SIGGRAPH Conference Job Fair returns in 2006 with extended hours and expanded offerings. The Job Fair is produced by CreativeHeads.net, The Job Board for professionals in the video game, animation, VFX, TV, film, and software tools and technology industries.

All registered SIGGRAPH 2006 attendees are welcome to attend the Job Fair at no additional cost. For a preliminary list of the Job Fair participants, see page 222.

Sponsored by:



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JOBS FOR THE RIGHT BRAINS

Career Symposium

Tuesday – Thursday, 1 – 3 August
10 am – 4 pm
Hall B1

In this informal lecture series, attendees discuss career-related topics with professionals and each other. Reel reviews, job hunting, production pipelines, and more.



Pathfinders

Sunday – Thursday, 30 July – 3 August
Hall B1

Maximize your visit to SIGGRAPH 2006. At the Pathfinders booth, veteran attendees provide free, friendly advice on how to find everything that's important to you.

XSV: Ex-Student Volunteer Mentoring Program

Interact with the former student volunteers who are supporting the conference and gaining valuable apprentice experience as members of the SIGGRAPH 2006 program sub-committees. The XSV Student Volunteers are working with the following program committees: Courses, Educators Program, Panels, Sketches, and GraphicsNet.

Days & Hours

Sunday, 30 July

8:30 am – 5:30 pm

Monday, 31 July

8:30 am – 5:30 pm

Tuesday, 1 August

8:30 am – 5:30 pm

Wednesday, 2 August

8:30 am – 5:30 pm

Courses

interdisciplinary instruction by experts from academia and industry who demonstrate the latest techniques, analyze complex algorithms and their implementations, and accelerate understanding of the core concepts in computer graphics and interactive techniques. Courses are presented as brief tutorials, half-day sessions, and intensive full-day sessions.

Full Conference registration allows attendees access to all SIGGRAPH 2006 courses. All the Course Notes are on the Full Conference DVD-ROM.

Seating in Courses is on a first-come, first-served basis. Please be sure to arrive early for the Courses you wish to attend.

Courses Committee

Dave Shreiner

Courses Chair

Φ(52) Consulting

Tony Apodaca

Pixar Animation Studios

Alex M. Lehmann

XSV: Ex-Student Volunteer

animoto GmbH

Sara McMains

SIGGRAPH 2007 Courses Co-Chair

University of California, Berkeley

Fred Pighin

Industrial Light & Magic

Peter Schröder

California Institute of Technology

Maryann Simmons

Walt Disney Feature Animation

Peter-Pike Sloan

SIGGRAPH 2007 Courses Co-Chair

Microsoft Corporation



Sunday, 30 July

1

Discrete Differential Geometry: An Applied Introduction

Full-Day, Sunday, 30 July, 8:30 am - 5:30 pm

Room 102

Level: Advanced

An introduction to fundamentals of discrete differential geometry (DDG), a nascent area of computational science with exciting simulation and geometry processing applications. Lectures discuss continuous and discrete geometry in the context of cloth, shell, and fluid simulation as well as remeshing and parameterization problems.

Prerequisites

Attendees should have a working knowledge of vector calculus and elementary linear algebra. Optional prerequisites: some lectures may also assume some familiarity with physical simulation, geometry processing, and triangle and tetrahedral meshes. Recommended but not required: a basic understanding of continuous local differential geometry and classical mechanics.

Intended Audience

Graduate students, researchers, and application developers who seek a unified understanding of the mathematics underlying common geometry-processing operations and how these fundamentals apply to problems such as Laplacian smoothing, surface fairing using prescribed curvature flow, remeshing, conformal parameterization, cloth/shell simulation, and fluid flow.

Co-Organizers

Eitan Grinspun
Columbia University

Mathieu Desbrun
California Institute of Technology

Lecturers

Konrad Polthier
Freie Universität Berlin

Peter Schröder
Ari Stern
California Institute of Technology

Schedule

- 8:30 am** Introduction to DDG:
A Didactic Walkthrough
What is DDG?
Walk Through Curves on the Plane
Overview
Schröder
- 9:20 am** What Can We Measure?
Brief overview of Grassmannians/Measure Theory
Intrinsic Measures for Meshes
Curvature Measures for Meshes
Curvature-Estimation for Meshes
Grinspun
- 10:15 am** Break
- 10:30 am** Geometry on Polyhedral Meshes
Applications of the Curvature Measures Described by Eitan
Mean Curvature Flow
Geodesics on Meshes
Polthier
- 11:20 am** Curvature Energies, Shells, and Cloth
Cloth and Thin Shell Simulation Using Previously Described Discrete Curvatures
Grinspun
- 12:15 pm** Lunch
- 1:30 pm** Discrete Exterior Calculus (DEC)
Desbrun
- 2:20 pm** Applications of DEC: Fluids & Meshing
Desbrun
- 3:15 pm** Break
- 3:30 pm** Discretizing the Right Geometry: The Example of Circles
Schröder
- 4:20 pm** Variational Integrators: Time vs. Space
Stern

Sunday, 30 July

2

Interactive Shape Editing

Full-Day, Sunday, 30 July, 8:30 am - 5:30 pm

Level: Intermediate

The state of the art in digital modeling techniques, both in commercial software and academic research. The goal of this course is to give attendees an understanding of the big open questions and the skills to engineer recent research in interactive shape-modeling applications.

Prerequisites

Computer graphics background, including mathematical concepts such as affine transformations and basic linear algebra, and some familiarity with common modeling techniques and standard shape representations.

Intended Audience

Developers, designers, and researchers interested in recent developments in interactive shape modeling and shape-editing techniques.

Organizer
Marc Alexa
Technische Universität Berlin

Lecturers
Marie-Paule Cani
Institut National Polytechnique de Grenoble

Sarah Frisken
Tufts University

Steven Schkolne
California Institute of the Arts

Karan Singh
University of Toronto

Denis Zorin
New York University

Room 210

Schedule	
8:30 am	Introduction & Motivation – Conceptual Shape Design Singh
9:30 am	Mathematical Representations of Shape for Modeling Zorin
10:15 am	Break
10:30 am	Global Space & Free Form Deformations Singh
11:30 am	Multiresolution Modeling Zorin
12:15 pm	Break
1:45 pm	Mesh Editing Based on Discrete Laplace and Poisson Models Alexa
2:45 pm	Volumetric Sculpting Frisken
3:30 pm	Break
3:45 pm	Toward “Virtual Clay” Cani
4:45 pm	Gesture-Based Shape Modeling Schkolne

inter

Sunday, 30 July

3

GPU Shading and Rendering

Full-Day, Sunday, 30 July, 8:30 am - 5:30 pm

Level: Intermediate

Programmable graphics hardware has found its way into almost every PC and game console sold today. This course features the latest exciting developments in shading hardware, a practical comparison of shading languages, and a glimpse of hardware shading returning to its production rendering roots.

Prerequisites

Working knowledge of a modern real-time graphics API such as OpenGL or Direct3D. Familiarity with the concepts of programmable shading and shading languages.

Intended Audience

Technical practitioners and software developers who use or intending to use graphics hardware for shading.

Organizer
Marc Olano
University of Maryland, Baltimore County

Lecturers
David Blythe
Microsoft Corporation

Larry Gritz
Mark Kilgard
NVIDIA Corporation

Michael McCool
University of Waterloo and RapidMind Inc.

Fabio Pellacini
Dartmouth College

Thorsten Scheuermann
ATI Research

Room 253

Schedule
Shading Technology

8:30 am Introduction
Olano

9 am Direct3D 10
Blythe

10:15 am Break

Shading Languages, Systems and Demos

10:30 am Shader Metaprogramming
With Sh
McCool

11:20 am OpenGL Shading Language
Olano

12:15 pm Lunch

1:30 pm Cg / NVIDIA
Kilgard

2:35 pm HLSL / ATI
Scheuermann

3:30 pm Break

GPUs in Production Rendering

3:45 pm GPU Production Animation
Gritz

4:30 pm Adapting Production
Shaders to GPUs
Pellacini

Wrap-up

5:15 pm Discussion and Questions
and Answers
**Olano, Blythe, Gritz,
Kilgard, McCool, Pellacini,
Scheuermann**

Sunday, 30 July

4

State of the Art in Interactive Ray Tracing

Full-Day, Sunday, 30 July, 8:30 am - 5:30 pm

Level: Advanced

Recent improvements in computer hardware have allowed ray tracing to be used in some interactive applications. The trends in architecture and expansions of geometric model should increase the use of interactive ray tracing. This course presents recent and often not-yet published work on interactive ray tracing.

Prerequisites

Knowledge of Whitted-style ray tracing.

Intended Audience

Software developers working in visualization, CAD, and games.
Secondary audience: hardware architects.

Co-Organizers

Peter Shirley
University of Utah

Philipp Slusallek
Universität des Saarlandes

Ingo Wald
University of Utah

Lecturers
William R. Mark
University of Texas

Gordon Stoll
Intel Corporation

Dinesh Minocha
University of North Carolina
at Chapel Hill

Abe Stephens
University of Utah

Hall B2

Schedule

8:30 am	Introduction and Overview Shirley
	Optimizing Ray Tracing Stoll
10:15 am	Break
10:30 am	Dynamic Environments Minocha
	Dynamic Models and Secondary Rays Wald
12:15 pm	Lunch
1:30 pm	Large Models on Supercomputers Stephens
	LODs and Data Layout Minocha
	Razor: Multiresolution Ray Tracing for Dynamic Environments Stoll and Mark
3:30 pm	Break
3:45 pm	Architectures for Ray Tracing Slusallek
	Current Work and Open Problems Slusallek, Stoll, Mark, Minocha, Stephens, Wald, Shirley

inter

Sunday, 30 July

5

High-Dynamic-Range Imaging: Theory and Applications

Full-Day, Sunday, 30 July, 8:30 am - 5:30 pm

Room 205

Level: Intermediate

New techniques in capturing, representing, processing, and displaying high-dynamic-range (HDR) images. HDR imagery represents the full range of light in the real world, which enables marked improvements in visual fidelity and photorealism. Application areas include lighting, compositing, film, game design, and display hardware.

Prerequisites

Familiarity with basic techniques in digital photography, traditional 8-bit image editing, and basic computer graphics modeling and rendering. Familiarity with a specific image-editing package or 3D modeling and rendering package is helpful.

Intended Audience

Students, researchers, and industrial developers in digital photography, computer graphics rendering, real-time photoreal graphics, game design and, visual effects production (especially rendering and compositing).

Co-Organizers

Paul Debevec
USC Institute for Creative Technologies

Erik Reinhard

University of Bristol
University of Central Florida

Lecturers

Greg Ward
AnyHere Software

Karol Myszkowski

Max-Planck-Institut für Informatik

Helge Seetzen

BrightSide Technologies Inc.

Habib Zargarpour

Electronic Arts

Gary McTaggart

Valve Corporation

Drew Hess

Industrial Light & Magic

Schedule

8:30 am	Why HDR? The Range of Light in the World What Can you do With HDR Images? Course Overview Reinhard	11:30 am	HDR Image-Based Lighting Illuminating Synthetic Objects With Real Light Computing Shadows and Interreflected Light of Synthetic Objects Onto Real Scenes Applications Debevec
8:40 am	Taking High-Dynamic-Range images Methods of Varying Photographic Exposure Deriving the Camera Response Curve Producing the Radiance Map Viewing and Editing HDR Imagery Capturing With Different Kinds of Hardware HDR Image Post-Processing (Vigneting, Glare, Motion Blur) Capturing Omnidirectional HDR Images Omni-Directional HDR Image Formats Debevec	12:15 pm	Lunch
9:15 am	HDR Image Representation Design Considerations for File Formats File Formats Flare Removal Ghost Removal Ward	1:30 pm	HDR Display Devices Projection Displays Alternative Technologies Connecting to the Legacy Pipeline Seetzen
10:15 am	Break	2:45 pm	HDR at ILM Hess
10:30 am	HDR Video and its Applications HDR MPEG Encoding HDR Video Player HDR Video Environment Maps Myszkowski	3:30 pm	Break
11:10 am	Tone Reproduction Operators Global Operators Local Operators Perceptually Inspired Operators Engineering-Based Solutions Current State of the Art Reinhard	3:45 pm	HDR at Valve McTaggart
		4:30 pm	HDR at EA (Need for Speed Most Wanted)) Zargarpour
		5:15 pm	Discussion and Questions and Answers All

national

Sunday, 30 July

6

Illustrative Visualization for Medicine and Science

Full-Day, Sunday, 30 July, 8:30 am - 5:30 pm

Room 156

Level: Intermediate

Research and recent development in computer-generated illustration techniques within non-photorealistic rendering. The course concentrates specifically on illustration methods for computer-generated technical, scientific, medical, and interactive illustrations of both surface and volumetric data. It also presents the perspective of two medical illustrators on computerized illustration.

Prerequisites

Required: intermediate knowledge of 3D computer graphics and scientific visualization algorithms. Programming experience using a 3D library for interactive graphics and some awareness of existing NPR techniques may be helpful. Not required: prior knowledge of or background in artistic techniques, traditional scientific illustration, or perceptual psychology.

Intended Audience

Researchers and practitioners interested in non-photorealistic and illustrative rendering, visualizing and managing scientific data, and/or interactive medical and scientific applications of computer graphics.

Co-Organizers

David S. Ebert
Purdue University

Mario Costa Sousa
University of Calgary

Lecturers

Bill Andrews
Medical College of Georgia

Stefan Bruckner
Technische Universität Wien

Bruce Gooch
Northwestern University

Don Stredney
Ohio Supercomputer Center

Nikolai Svakhine
Purdue University

Ivan Viola
Technische Universität Wien

Schedule

8:30 am Introduction
History and Needs of Medical Illustration
Andrews

9:30 am Overview of NPR for Computerized Illustration
Sousa

10:15 am Break

10:30 am Perception and Evaluation: Optimizing Computer Imagery for Communication
Gooch

11:30 am Volume Illustration for Medicine and Flows (Part 1)
Ebert

12:15 pm Lunch

1:30 pm Volume Illustration for Medicine and Flows (Part 2)
Ebert and Svakhine

2:15 pm Focus of Attention, Context and Smart Visibility in Visualization
Viola and Sousa

3:15 pm Break

3:30 pm Interactive Illustrative Volume Visualization Techniques for Exploration and Communication
Bruckner

4:15 pm Illustrative Visualization: Implications for Interactive Medical Simulation and Training
Stredney

Sunday, 30 July

7

Beyond One Perspective: Using Video Camera Arrays for Graphics

Half Day, Sunday, 30 July, 8:30 am - 12:15 pm

Room 258

Level: Intermediate

Capture, analysis, and rendering of dynamic, real-world scenes and phenomena using multiple video cameras. This course describes hardware, calibration, and algorithms. Topics include modeling dynamic geometry and volumetric phenomena (such as smoke and fire); high-quality, real-time, video-view interpolation; and spatio-temporal view interpolation.

Prerequisites

Familiarity with the concept of image-based rendering. Last year's course notes on video-based rendering might be helpful, but are not required.

Intended Audience

Students interested in interdisciplinary graphics and vision research, as well as professionals from the motion picture, special effects, and interactive entertainment industries. SIGGRAPH 2005 attendees who found last year's course on video-based rendering interesting will learn about new research and applications.

Co-Organizers

Marcus Magnor
Technische Universität Braunschweig

Bennett Wilburn
Microsoft Research Asia

Lecturer
Larry Zitnick
Microsoft Research

Schedule

- 8:30 am** Introduction
Magnor
- 8:45 am** Infrastructure
Camera Hardware
Camera Array Architectures
Calibration
Wilburn
- 9:20 am** High-Performance Imaging
With Large Camera Arrays
High-Resolution, High-Dynamic Range Video
High-Speed Video
Synthetic Aperture Video
Space-Time View Interpolation
Wilburn
- 10:15 am** Break
- 10:30 am** Video-Based Modeling
Kinematic Chain Capture (Humans)
Cloth Motion
Volumetric Phenomena (Fire, Smoke, Water)
Magnor
- 11:15 am** Video View Interpolation
Algorithms (Disparity Estimation)
Compression & Real-Time Rendering
Zitnick
- noon** Summary and Outlook
Zitnick

Sunday, 30 July

8

An Interactive Introduction to OpenGL Programming

Half Day, Sunday, 30 July, 8:30 am - 12:15 pm

Room 157

Level: Beginning

This course provides the knowledge that a novice OpenGL programmer needs to author interactive, 3D graphics applications using OpenGL. It covers fundamental topics such as modeling, lighting, depth buffering, and texture mapping, and introduces advanced topics such as using vertex and fragment programs.

Prerequisites

Attendees should be able to read simple programs written in the C language. No previous experience with writing graphics programs is required. The course includes some basic concepts from linear algebra (vector notation and matrix multiplication), but previous knowledge of these subjects is not required.

Intended Audience

Everyone interested in learning how to create applications with OpenGL. Attendees will learn enough to write interactive OpenGL applications with moving, lit, and textured 3D objects.

Course 8 is open to Full Conference and Conference Select attendees. All other Courses require Full Conference registration.

Organizer**Ed Angel**

University of New Mexico

Lecturers**Vicki Shreiner**

SGI

Dave Shreiner

Φ(52) Consulting

Schedule

- 8:30 am** Welcome, Introduction of Speakers, Course Overview
Angel
- 8:30 am** Getting Started
What You Need to Write an OpenGL Application
Opening an OpenGL Window
Accessing OpenGL Functions
Using User Input
V. Shreiner
- 9:10 am** Working With Objects in OpenGL
How OpenGL Specifies Objects
Working With Geometric Transformations
Depth Buffering
Animation - Getting Objects to Move
V. Shreiner
- 9:55 am** Lighting
Specifying Lighting, Normals
Lights, Materials, Action
D. Shreiner
- 10:15 am** Break
- 10:30 am** Lighting (Continued)
- 10:55 am** Texture Mapping
Fundamentals
Loading Textures
Enabling Texture Mapping
Specifying Texture Coordinates
How Textures are Applied
Angel and D. Shreiner
- 11:40 am** Survey of Advanced Topics
Buffers
Introduction to Vertex and Fragment Programs
Angel and D. Shreiner
- 12:05 pm** Conclusion and Questions and Answers
Angel, D. Shreiner and V. Shreiner

Sunday, 30 July

9

The Art of “Open Season”: Traditional 2D Styling With Today’s Bells and Whistles

Half Day, Sunday, 30 July, 8:30 am - 12:15 pm

Hall C

Level: Beginning

A detailed behind-the-scenes view of how a team of digital artists and technicians can work closely with a team of talented traditional storytellers and artists to create a feature animated film. The course demonstrates how the most advanced technology and tools were developed from concept to screen.

Prerequisites

Anyone who is interested in adapting traditional storytelling techniques to animated feature films. Understanding of 3D and CGI is helpful but not required.

Intended Audience

Traditional and computer animators, visual effects artists, educators, producers, technical directors, storytellers, visual concept artists, and developers.

Organizer

Sande Scoredos
Sony Pictures Imageworks

Lecturers

Doug Ikeler
Darren Lurie
Amy Jupiter
Thomas Hollier
Sony Pictures Imageworks

Schedule

8:30 am	Original Visual Development Goals and the Plans that Were Made to Execute Them Eyevind Earl and His Artwork Animation Style Desired by Directors Graphic Shape Language Ikeler	Details Rendered Into Highlights but not Shadows Atmosphere and Depth of Field Used to Introduce Distinct Separation Between FG, Mid Ground, and BG Exaggerated Cast Shadows not Accurate to Geometry in Shot Hollier
9:30 am	Character Design, Animation and Rendering Early Character Design Artwork Style and Needs of Animation Dynamic Hair That Does not Break the Character Profile Dynamic Cloth That Does not Break the Character Profile and Design Extras and Props Lurie	11:45 am Discussion of the Production Aspects of the Film Jupiter
10:30 am	Break	noon Questions & Answers Ikeler, Lurie, Jupiter, Hollier, Scoredos
10:45 am	Environments? Design, Scale and Scope Architecture and the Amount of Detail Needed to Achieve Look Populating Forest Environments Water Effects Render Techniques, Tricks, and Pitfalls Ambient Occlusions Portion of GI Full Furred Character With Hair-to-Hair Shadowing	

Sunday, 30 July

10

Procedural Modeling of Urban Environments

Half Day, Sunday, 30 July, 1:45 - 5:30 pm

Room 157

Level: Intermediate

Procedural modeling techniques for creation of highly detailed three-dimensional urban models in computer games and movies. The course covers problems associated with modeling street layouts, land-use systems, and architecture. It combines new research from academia and state-of-the art industrial modeling practices.

Prerequisites

Knowledge of basic computer graphics, such as triangle meshes, hierarchical data structures, texture mapping and ray tracing, as well as basic knowledge of procedural modeling techniques such as particle and L-systems.

Intended Audience

Users and researchers of computer graphics modeling tools for creating 3D digital content.

Co-Organizers

Ben Watson
North Carolina State University

Peter Wonka
Arizona State University

Lecturers
Pascal Müller
Eidgenössische Technische Hochschule Zürich

Eric Hanson
Visura Imaging

Schedule

1:45 pm	Introduction Watson
2 pm	Procedural Modeling of Buildings Wonka
2:45 pm	Urban Modeling in the Visual Effects Industry Hanson
3:30 pm	Break
3:45 pm	Procedural Modeling of Cities Mueller
4:30 pm	Procedural Modeling Using Urban Simulation Watson
5:15 pm	Wrap Up Hanson, Mueller, Watson, Wonka

inter

Sunday, 30 July

11

“The Chronicles of Narnia”: The Lion, The Crowds, and Rhythm & Hues

Half Day, Sunday, 30 July, 1:45 - 5:30 pm

Hall C

Level: Intermediate

For its work on “The Chronicles of Narnia,” Rhythm & Hues created a new work flow, new tools, and new procedures. This course offers a detailed look at the production, from Aslan to the crowds of mythological creatures in the battle. Detailed topics include proprietary software, pipeline, rigging, fur, dynamics, crowds, and more.

Prerequisites

Intermediate knowledge of 3D work flow, procedures, and terminology is helpful but not required. Topics range from intermediate to advanced.

Intended Audience

Anyone with an interest in film character work, including students looking for an overview of how large productions run and seasoned professionals looking for ideas to incorporate into their work.

Organizer
Brad Hiebert
Rhythm & Hues Studios

Lecturers
Jubin Dave
Tae-Yong Kim
Ivan Neulander
Hans Rijpkema
Will Telford
Rhythm & Hues Studios

Schedule	
1:45 pm	Welcome, Introduction of Speakers, Short Overview
1:50 pm	Pipeline Overview Telford
2 pm	Aslan: From Model to Render Modeling Body Rigging Facial Rigging Animation Testing Hiebert Fur Neulander Dynamics Kim
3:20 pm	Questions and Answers
3:30 pm	Break
3:45 pm	Mythological Characters - Issues and Solutions Gryphon Centaur Telford
4:05 pm	Battlefield Introduction Rigging Considerations Motion Generation Skinning of a Crowd Lighting and Rendering Flexible Body Dynamics Rijpkema
5:20 pm	Questions and Answers

personal

Sunday, 30 July

12

Digital Modeling of the Appearance of Materials

Half Day, Sunday, 30 July, 1:45 - 5:30 pm

Room 258

Level: Beginning

Realistic computer graphics rendering requires modeling the appearance of physical materials. This course covers the range of techniques for specifying materials, including classifying physical materials by observation, basic mathematical representation, modeling material appearance change over time, and integrating material models into rendering systems.

Prerequisites

Introductory familiarity with computer graphics. The course assumes that attendees understand basic ideas such as setting a pixel color by specifying values of red, green, and blue, and specifying an image by positioning a digitally defined object, point lights, and a virtual pinhole camera.

Intended Audience

People who are interested in realistic rendering. Artists, programmers, and students interested in graphics research. Attendees may want to know how to achieve realistic material appearance with existing software packages or how to write their own code for realistically shading objects.

Organizer
Holly Rushmeier
Yale University

Lecturers
Julie Dorsey
Yale University

François Sillion
INRIA

Schedule	
1:45 pm	Introduction Dorsey
2:05 pm	Observing and Classifying Materials Rushmeier
2:35 pm	Numerical Models Rushmeier
3:30 pm	Break
3:45 pm	Processing of Materials Dorsey
4:45 pm	Integrating Material Models Into Rendering Systems Sillion

Monday, 31 July

13

Surface Modeling and Parameterization With Manifolds

Half Day, Monday, 31 July, 8:30 am - 12:15 pm

Room 156

Level: Intermediate

What do configuration spaces of animation skeletons, a subdivision surface, and a panorama have in common? All of these are examples of manifolds. The goal of this course is to present an overview of manifold constructions that are useful for graphics applications, with a focus on two dimensional manifolds (surfaces).

Prerequisites

Mathematical prerequisites: basic calculus, complex numbers, and vector and matrix algebra. General familiarity with graphics research is helpful but not required.

Intended Audience

Researchers from academia and industry who are interested in applying manifold-based techniques in their work; practitioners interested in applying the latest graphics research using manifold ideas.

Organizer
Cindy Grimm
Washington University in St. Louis

Lecturer
Denis Zorin
New York University

Schedule	
8:30 am	Introduction Grimm
8:40 am	What is a Manifold? Grimm
9:15 am	Advantages of Using Manifolds Zorin
9:30 am	Building Manifolds From Meshes Grimm and Zorin
10:15 am	Break
10:30 am	Applications in Graphics and Vision Grimm
11 am	Relationship to Splines Grimm
11:15 am	Surface Parameterization Zorin
11:45 am	Building Manifolds for Common Domains Grimm

Monday, 31 July

14

Fluid Simulation

Half Day, Monday, 31 July, 8:30 am - 12:15 pm

Room 210

Level: Advanced

Animating fluids like water, smoke, and fire by physics-based simulation is increasingly important in visual effects and is starting to make an impact in real-time games. This course goes from the basics of 3D fluid flow to the state of the art in graphics. Attendees will learn the core concepts of fluid flow, cutting-edge techniques, and implementation details. Slides, notes, and (where possible) example code will be provided.

Prerequisites

Familiarity with differential equations at the graphics level, basic Newtonian physics, basic numerical methods. Attendees should know what a finite difference is and what $F=ma$ means.

Intended Audience

Developers in industry who want to implement state-of-the-art fluid simulations and researchers new to the field.

Organizer
Robert Bridson
The University of British Columbia

Lecturers
Ronald Fedkiw
Stanford University

Matthias Müller-Fischer
AGEIA

- Schedule**
- 8:30 am** Welcome and Overview
 - 8:35 am** Equations of Fluids
 - 8:55 am** Advection Algorithms
 - 9:05 am** Making Fluids Incompressible
 - 9:20 am** Advanced Boundary Conditions
 - 9:30 am** Turning it Into Smoke
 - 9:40 am** Water and Level Sets
 - 10:05 am** Particle-in-Cell Methods
Bridson
 - 10:15 am** Break

- The Cutting-Edge in Film**
- 10:30 am** The Particle-Level Set Method
 - 10:45 am** Vorticity Confinement and Vortex Particles
 - 10:50 am** Octree Methods
 - 11 am** Fire
Fedkiw

- Real-Time Fluids**
- 11:05 am** Smoothed Particle Hydrodynamics
 - 11:35 am** Real-Time Water
Müller-Fischer

- Non-Newtonian Fluids**
- 11:50 am** Viscoelastic Goop
 - 11:55 am** Sand and Mud
Bridson

Monday, 31 July

15

Computational Photography

Half Day, Monday, 31 July, 8:30 am - 12:15 pm

Room 258

Level: Intermediate

Computational methods for overcoming the traditional limitations of a camera and enabling novel imaging applications. The course provides a practical guide to topics in image capture and manipulation methods for generating compelling pictures for computer graphics and for extracting scene properties for computer vision, with several examples.

Prerequisites

A basic understanding of camera operation and image processing. Familiarity with concepts of linear systems, convolution, and machine vision is useful.

Intended Audience

Photographers, digital artists, image processing programmers and vision researchers who use or build applications for digital cameras or images will learn about camera fundamentals and powerful computational tools, with many real-world examples.

Co-Organizers

Ramesh Raskar
Mitsubishi Electric Research
Laboratories (MERL)

Jack Tumblin
Northwestern University

Lecturers

Marc Levoy
Stanford University

Shree Nayar
Columbia University

Schedule

- 8:30 am** Introduction
Raskar
- 8:35 am** Concepts in Computational
Photography
Tumblin
- 8:50 am** Understanding Film-
Like Photography
Tumblin
- 9 am** Image-Processing Tools
Raskar
- 9:15 am** Image-Reconstruction
Techniques
Tumblin, 20 mins
- 9:35 am** Computational Camera:
Convergence of Optics
and Software
Nayar
- 10:15 am** Break
- 10:30** Computational Imaging in
the Sciences
Levoy
- 11:10 am** Computational Illumination
Raskar
- 11:15 am** Smart Optics, Modern
Sensors and Future
Cameras
Raskar
- 11:35 am** Question and Answers
**Nayar, Levoy, Raskar,
Tumblin**

Monday, 31 July

16

OpenKODE: An Open Mobile Media Development Environment

Half Day, Monday, 31 July, 8:30 am - 12:15 pm

Room 102

Level: Intermediate

OpenKODE is an open, cross-platform, royalty-free development environment for mobile media. This cohesive framework includes APIs for 3D graphics, scalable vector graphics, video, audio, and an open digital-asset schema designed for interactive applications. This course provides an overview of each of OpenKODE's constituent technologies.

Prerequisites

Programming experience in C or C++ and some graphics programming experience. Working knowledge of OpenGL and the mathematics of computer graphics is helpful. Experience with video or audio processing is helpful.

Intended Audience

Software developers who are targeting the mobile media market. Desktop or workstation application developers who need an introduction to developing for mobile media. Anyone who wants to learn about this exploding market.

Organizer
Randi Rost
Intel Corporation

Lecturers
Lars Bishop
NVIDIA Corporation

Chris Hall
Seaweed Systems

Robert Simpson
Bitboys Oy

Dan Rice
Sun Microsystems, Inc.

Brian Murray
Freescale

Mark Barnes
Sony Computer
Entertainment America

Timo Suoranta
Futuremark Oy

Schedule	
8:30 am	Khronos Overview Rost
8:45 am	OpenGL ES v1.1, v2.0 and EGL Bishop
9:45 am	GLSL for OpenGL ES Simpson
10:15 am	OpenGL ES Safety Critical Hall
10:30 am	Break
10:45 am	OpenVG Rice
11 am	OpenMAX Murray
11:15 am	COLLADA Barnes
11:30 am	Developer Perspectives Suoranta

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Monday, 31 July

17

Physically Based Reflectance for Games

Half Day, Monday, 31 July, 8:30 am - 12:15 pm

Room 205

Level: Intermediate

How to use the physical principles of reflectance to increase game realism while acknowledging real-world production issues such as performance and ease of content creation. In this course, game developers learn how to incorporate realistic reflectance in their games, and graphics researchers learn how to evaluate the applicability of their research to game development.

Prerequisites

Some knowledge of a low-level graphics API such as DirectX or OpenGL, or experience with modern graphics hardware. Basic understanding of calculus is recommended.

Intended Audience

Game developers and researchers whose focus is real-time graphics.

Organizer
Nathaniel Hoffman
Naughty Dog, Inc.

Lecturers
Dan Baker
Microsoft Corporation

Jan Kautz
University College London

Schedule	
8:30 am	Introduction Hoffman
8:40 am	Reflectance Types of Reflectance Reflection Theory Reflection Model Foundations Hoffman
9:15 am	Game Development Game Platforms Computation and Storage Constraints Production Considerations The Game Rendering Environment Baker and Hoffman
10:15 am	Break
10:30 am	Reflectance Rendering With Point Lights Hoffman and Baker Analytical BRDFs Hoffman and Baker Other Types of BRDFs Anti-Aliasing and Level of Detail Baker
11:15 am	Reflectance Rendering With Environment Map Lighting Environment Maps Filtered Environment Maps Anti-Aliasing Precomputed Radiance Transfer Kautz
noon	Conclusions/Summary Hoffman, Baker, and Kautz

Monday, 31 July

18

An Introduction to Sketch-Based Interfaces

Half Day, Monday, 31 July, 8:30 am - 12:15 pm

Room 157

Level: Beginning

Sketch-based interfaces are a natural, pencil-and-paper-like approach to interacting with a variety of applications, including conceptual modeling, animation, and note-taking systems. This course offers an in-depth discussion of sketch-based interface design, ranging from simple gestural commands to complex sketch-understanding systems. Attendees will learn how these interfaces are designed and how to develop their own.

Prerequisites

Knowledge of basic concepts in human-computer interaction and/or user interfaces. Interest in understanding how sketch-based interfaces work.

Intended Audience

Anyone interested in learning about sketch-based interfaces, especially researchers and user-interface designers.

Organizer
Joseph LaViola
Brown University

Lecturers
Randall Davis
Massachusetts Institute of Technology

Takeo Igarashi
The University of Tokyo

Schedule

8:30 am Welcome and Introduction
LaViola

8:50 am Sketching and Gestures 101
LaViola

9:15 am Sketch-Based Interfaces for Interactive Computer Graphics
Igarashi

10:15 am Break

10:30 am Sketch Understanding: Toward Natural Interaction
Davis

11:30 am Mathematical Sketching
LaViola

noon Questions and Answers
LaViola, Davis, and Igarashi

Monday, 31 July

19

Spatial Augmented Reality

Tutorial, Monday, 31 July, 3:45 - 5:30 pm

Room 102

Level: Intermediate

A survey of the latest techniques for augmented reality, which go beyond conventional head mounted displays. The tutorial introduces prototypes, explains rendering and calibration algorithms, discusses case studies, and presents practical experience. Attendees learn about new applications enabled by current augmented-reality techniques that combine the real and virtual worlds in art, science, education, and industry.

Prerequisites

No programming or specific mathematical background is required. General knowledge of basic computer graphics techniques, 3D tools, and optics is helpful but not required. This course is appropriate for beginners in digital art and media.

Intended Audience

Designers of augmented-reality systems, programmers and artists who are working on interactive applications.

Co-Organizers & Lecturers

Oliver Bimber
Bauhaus-Universität Weimar

Ramesh Raskar
Mitsubishi Electric Research
Laboratories (MERL)

Schedule

- 3:45 pm** Introduction and Review of Current AR Approaches
Bimber
- 4 pm** Concepts in Projector-based Augmentation
Raskar
- 4:35 pm** Augmentation on Everyday Surfaces
Bimber
- 5:10 pm** Prototypes and Experiences
Bimber and Raskar
- 5:25 pm** Questions and Answers

Monday, 31 July

20

QTKit: A Modern Framework for Multimedia Applications **CANCELLED**

21

Taxonomy of Digital Creatures: Defining Character Development Techniques Based Upon Scope of Use

Tutorial, Monday, 31 July, 3:45 - 5:30 pm		Room 258
Level: Beginning Using computer graphics to develop digital creatures from concept to realization requires a series of decisions based on how the character is expected to be seen. This course focuses on how to use a creature's scope of appearance to effectively define the best use of modeling, rigging, look development, and animation techniques. Prerequisites Basic comprehension of modeling, animation, and look development. Intended Audience Students and professionals who are interested in or work in the areas of digital creature design, development, and animation.	Organizer & Lecturer Tim McLaughlin Industrial Light & Magic	Schedule 3:45 pm Introduction Defining Scope of Appearance 3:55 pm Reference Material and Design Style 4:30 pm Look Development and Motion Development Questions 4:55 pm Interaction and Integration 5:15 pm Conclusion and Questions

Monday, 31 July

22

Résumés and Demo Reels: If Yours Aren't Working Neither Are You!

Tutorial, Monday, 31 July, 3:45 - 5:30 pm

Level: Beginning

Learn what it takes to get a job in the computer graphics field. A top career coach and recruiter reveals the secrets of how to create an irresistible résumé and showcase your talent in a demo reel to get the job you want. Sample résumés and demo reels are included.

Prerequisites

None.

Intended Audience

Hiring managers and job seekers at all levels.

Organizer & Lecturer
Pamela Kleibrink Thompson
Ideas to Go

Room 205

Schedule	
3:45 pm	Introduction
3:50 pm	Résumés and Cover Letters
4:10 pm	Portfolios
4:25 pm	Demo Reels and Shot Breakdown
5:15 pm	Career Tips
5:20 pm	Questions and Answers

Monday, 31 July

23

The Web as a Procedural Sketchbook

Tutorial, Monday, 31 July, 3:45 - 5:30 pm

Room 156

Level: Intermediate

Ideas that effectively integrate new technology with new visual design can be quickly developed and published on the web, using only Java applets. With a selection of applets as illustrative examples, this course teaches, step by step, how to rapidly develop and publish visual and procedural ideas (animation, modeling, design, gameplay paradigms, etc.) on the web. The course provides source code for an extensive set of libraries that enable rapid development of such applets.

Prerequisites

No prerequisites for the first module. The second module requires knowledge of programming on the level of C or Java or an equivalent language. Attendees may benefit more from some subtopics if they have a knowledge of graphics.

Intended Audience

People who are familiar with programming and want to communicate ideas to the larger community.

Organizer & Lecturer

Ken Perlin

New York University,
Media Research Lab

Tuesday, 1 August

24

Exploiting Perception in High-Fidelity Virtual Environments

Full-Day, Tuesday, 1 August, 8:30 am - 5:30 pm

Room 102

Level: Intermediate

This course introduces high-fidelity virtual environments and explains the key components required to build compelling environments. Then it details perceptually inspired techniques that facilitate high-fidelity rendering, collaboration, and complex interaction in these virtual environments. Particular emphasis is placed on real applications, with several live demonstrations.

Prerequisites

A basic knowledge of general 3D computer graphics techniques, virtual reality, the concept of presence, multisensory environments, and peripheral equipment.

Intended Audience

Attendees who are interested in interactive 3D graphics, virtual environments, human-computer interaction, high-fidelity graphics, perceptually guided methods, collaborative virtual environments, collision detection techniques, and multi-modal interaction.

Organizer

Mashhuda Glencross

The University of Manchester

Lecturers

Alan Chalmers

University of Bristol

Diego Gutiérrez

Universidad de Zaragoza

Ming Lin

University of North Carolina
at Chapel Hill

Miguel Otaduy

Eidgenössische Technische
Hochschule Zürich

Schedule

8:30 am	Introduction High-Fidelity Virtual Environments Requirements Perception in Virtual Environments Glencross
9 am	Rendering Fidelity for Virtual Environments High-Fidelity Graphics Parallel Processing Applications in Archaeology Chalmers
10:15 am	Break
10:30 am	Rendering Fidelity for Virtual Environments Speeding up Global Illumination Selective Rendering Perceptual Realism in Real Time Chalmers
11:10 am	Rendering Nature Light in The Atmosphere Ghost Ships and Fairy Tales: Mirages and Other Optical Effects Simulating Sunsets Participating Media An Industrial Perspective Open Challenges Gutiérrez
12:15 pm	Lunch
1:45 pm	Collaboration in Virtual Environments Main Challenges Shared Interaction Distributing Simulations Real Networks Considerations for Distributed Haptic Environments Collaborative Virtual Prototyping Glencross
2:30 pm	Multi-Sensory Interaction in Virtual Environments Interaction in 3D Environments Introduction to Collision Detection Techniques Real-Time Sound Synthesis Lin
3:30 pm	Break
3:45 pm	State of the Art of Haptic Interaction Introduction to Haptic Rendering H-COLLIDE: Scalable Collision Detection for Three-Degree-of-Freedom (3-DOF) Haptic Display Techniques for Six-Degree-of-Freedom Haptic Rendering Lin
4:15 pm	High-Fidelity Haptic Interaction Psychophysics of Touch Sensation-Preserving Simplification of Complex Geometry Perceptually Driven Haptic Texture Rendering Otaduy
5:15 pm	Summary Chalmers
5:20 pm	Questions and Answers Glencross, Chalmers, Gutiérrez, Lin, and Otaduy

Tuesday, 1 August

25

RenderMan for Everyone

Full-Day, Tuesday, 1 August, 8:30 am - 5:30 pm

Room 258

Level: Intermediate

An in-depth three-part course designed to expand knowledge of the RISpec. The first part is an introduction to RenderMan. The second is a detailed look into the RISpec. The third presents tips and tricks used in production.

Prerequisites

Experience in programming or shading is not necessary (at least for the first parts), but the course assumes that attendees have advanced knowledge of 3D graphics and rendering concepts. Programming experience is helpful but not required.

Intended Audience

Everyone who is interested in learning RenderMan.

Organizer
Rudy Cortes
Walt Disney Feature Animation

Lecturers
Hal Bertram

Dan Maas
Maas Digital

Moriz Moeller
Rising Sun Pictures

Saty Raghavachary
DreamWorks Animation

Tal Lancaster
Heather Pritchett
Walt Disney Feature Animation

Schedule	
8:30 am	Welcome and Introduction Cortes
8:45 am	A Brief Introduction To RenderMan Raghavachary
9:45 am	What The RenderMan Spec Never Told You Maas
10:45 am	Break
11 am	Going Mad With Magic Lights Moeller
12:15 pm	Lunch
1:30 pm	Changes to RenderMan: PRMan 13 Preview Lancaster
2:30 pm	RenderMan In Production at WDFA - Part 1 Pritchett
3:15 pm	Break
3:30 pm	RenderMan in Production at WDFA - Part 2 Lancaster
4:15 pm	Production Rendering Acceleration Techniques Bertram
5:20 pm	Questions and Answers - Wrap Up and Make Up Time
5:30 pm	Party Time - RenderMan Users BOF

Tuesday, 1 August

26

Advanced Real-Time Rendering in 3D Graphics and Games

Full-Day, Tuesday, 1 August, 8:30 am - 5:30 pm

Room 156

Level: Intermediate

The amazing power of the latest GPUs has spurred a real osmosis of ideas between the game developers and state-of-the-art graphics research. This course presents innovative real-time algorithms from award-winning game engines and groundbreaking 3D rendering that are pushing the visual boundaries and interactive experience of complex virtual worlds. The techniques are applicable in real-time and offline domains. Attendees will learn several innovative highly optimized algorithms in various areas of real-time rendering.

Prerequisites

Working knowledge of a modern real-time graphics API like OpenGL or Direct3D. Familiarity with the concepts of programmable shading and shading languages.

Intended Audience

Technical practitioners and developers of graphics engines for visualization, games, or effects rendering who are interested in interactive rendering.

Organizer

Natalya Tatarchuk
ATI Research, Inc.

Lecturers

Christopher Oat
Pedro Sander
ATI Research, Inc.

Jason Mitchell
Valve Corporation

Alex Evans
Independent Game Developer

Carsten Wenzel
Crytek GmbH

Schedule

- | | |
|-----------------|--|
| 8:30 am | Introduction
Tatarchuk |
| 8:45 am | Out-of-Core Rendering of Large Meshes With Progressive Buffers
Sander |
| 9:30 am | Animated Skybox Rendering and Lighting Techniques
Sander |
| 9:45 am | Rendering Gooney Materials With Multiple Layers
Oat |
| 10:15 am | Break |
| 10:30 am | Fast Approximations for Global Illumination on Dynamic Scenes
Evan |
| 11:15 am | Parallax Occlusion Mapping for Detailed Surface Rendering
Tatarchuk |
| 12:15 pm | Lunch |
| 1:30 pm | Shading in Valve's Source Engine
Mitchell |
| 2:15 pm | Artist-Directable Real-Time Rain Rendering in City Environments
Tatarchuk |
| 3:30 pm | Break |
| 3:45 pm | Ambient Aperture Lighting
Oat |
| 4:30 pm | Real-Time Atmospheric Effects in Games
Wenzel |
| 5:15 pm | Question and Answers
Tatarchuk, Oat, Sander, Mitchell, Evans, Carsten Wenzel |

Tuesday, 1 August

27

The Art of Story Telling

Full-Day, Tuesday, 1 August, 8:30 am - 5:30 pm

Level: Beginning

Four of Hollywood's screenwriter gurus teach story structure, how to create believable characters, and the techniques that make stories connect with an audience on an emotional level.

Prerequisites

Basic interest in story and characters.

Intended Audience

People who want to understand the process of creating story content for formats such as animated films and video games.

Organizer

Ted Burge
Walt Disney Feature Animation

Lecturers

Karl Iglesias
University of California, Los Angeles

Rob Tobin

Peter Mellencamp

Jim Mercurio

Room 205

Schedule

- 8:30 am** Introduction
Burge
- 8:36 am** Crafting a Compelling Story for Emotional Impact
Iglesias
- 10:15 am** Break
- 10:30 am** Character and Story
The Seven Essential Elements of a Well-Written Story
Objective and Subjective Storylines
Credible Dialogue and Characters
Tobin
- 12:15 pm** Lunch
- 1:45 pm** Mythology: The Hero's Journey
Story Structure: The Most Crucial Aspect of Storytelling
Basic Elements
Mythology: The Origin of Dramatic Storytelling
Hero's Journey
Discussion of "The Lion King": is it Really Mythological?
The Future of Visual Storytelling
Mellencamp
- 3:30 pm** Break
- 3:45 pm** Killer Endings
Definition of Terms: Goal, Need, Beat, Story, Crisis, Climax, Resolution
Paradigm
Conclusion
Mercurio
- 5:25 pm** Wrap-Up, Questions, and Answers
Burge, Iglesias, Mellencamp, Mercurio, Tobin

inter

Tuesday, 1 August

28

Recreational Computer Graphics

Half-Day, Tuesday, 1 August, 8:30 am - 12:15 pm

Room 253

Level: Beginning

Computer graphics provides tools for expanding our imaginations, exploring the natural world, and creating stunning shapes, images, textures, and patterns. This course looks at seven diverse topics that use graphics in surprising ways to help us enjoy the wonder and beauty of the world we live in: solar halos and sun dogs, soap bubbles, Fourier polygons, camera shutters, Celtic knotwork, and aperiodic textures. In the last section of the course, an origami exercise gives attendees an opportunity to build beautiful Platonic solids by simply folding paper.

Prerequisites

An inquisitive mind, an alert imagination, and a ready smile. Otherwise, no prerequisites. Those familiar with graphics will get a little more out of a few of the topics.

Intended Audience

People with active imaginations, curiosity, and interests in the natural and human-made worlds and their visual phenomena. Anyone who wants to go beyond the user's manual and use the principles of graphics for discovery, invention, and understanding.

Organizer & Lecturer
Andrew Glassner
Coyote Wind Studios

Schedule	
8:30 am	Sky Beauty: Solar Halos and Sun Dogs
9:20 am	The Colors and Shapes of Soap Bubbles
10:00 am	The Essence of Polygons
10:15 am	Break
10:30 am	Surprises From Camera Shutters
10:50 am	Celtic Knots in 2D and 3D
11:20 am	Aperiodic Textures for Fun and Design
11:40 am	Hands-on 3D Geometric Origami

Wednesday, 2 August

29

Geometric Modeling Based on Triangle Meshes

Full-Day, Wednesday, 2 August, 8:30 am - 5:30 pm

Room 258

Level: Intermediate

This course is designed to cover the entire geometry processing pipeline based on triangle meshes. Speakers present the latest concepts for mesh generation and mesh repair; geometry and topology optimizations like mesh smoothing, decimation, and remeshing; and parametrization, segmentation, and shape editing. In addition to describing and discussing the related algorithms, the course provides valuable implementation hints and source code for most of the covered topics.

Prerequisites

The course assumes only very basic knowledge of geometric concepts in general, but does not require specific knowledge of polygonal meshes and how to discretize their respective problems.

Intended Audience

Computer graphics researchers, software developers, and engineers working in CAGD, computer games, or the movie industry, who are interested in geometry-processing algorithms based on triangle meshes.

Co-Organizers

Mario Botsch
Mark Pauly
 Eidgenössische Technische
 Hochschule Zürich

Lecturers

Stephan Bischoff
Leif Kobbelt
 RWTH-Aachen University

Christian Rössl
 INRIA Sophia Antipolis

Schedule

8:30 am	Introduction Botsch
8:45 am	Surface Representations Explicit/Implicit Surface Representations Triangle Meshes Kobbelt and Botsch
9:30 am	Mesh Repair Kinds of Input Data Explicit Repair Volumetric Repair Bischoff
10:15 am	Break
10:30 am	Mesh Quality Triangle Shapes Shading, Reflection Lines Discrete Curvatures Pauly
11:05 am	Mesh Smoothing Laplacian Smoothing Anisotropic, Bi-Lateral Smoothing Rössl
11:40 am	Mesh Parametrization Discrete Harmonic Maps Discrete Conformal Maps Free Boundaries, Arbitrary Surfaces Rössl
1:45 pm	Mesh Decimation Vertex Clustering Incremental Decimation Out-of-Core Decimation Pauly
2:30 pm	Remeshing Isotropic Remeshing Anisotropic Remeshing Variational Shape Approximation Mesh Segmentation Kobbelt
3:30 pm	Break
3:45 pm	Mesh Editing Surface-Based Deformation Space Deformations Multiresolution Modeling Differential Coordinates Botsch
4:35 pm	Numerics Linear System Solvers Comparison of Existing Libraries Botsch
5:05 pm	Questions and Answers Botsch, Pauly, Bischoff, Kobbelt, and Rössl

Wednesday, 2 August

30

Performance-Driven Facial Animation

Full-Day, Wednesday, 2 August, 8:30 am - 5:30 pm

Room 205

Level: Intermediate

Performance-driven facial animation (PDFA) has recently been adopted in a number of important entertainment projects. This course describes tracking, cross mapping, and model derivation technologies used in PDFA, and summarizes unresolved issues. Leading researchers and industry specialists present current and forthcoming motion-capture techniques, crossmapping technologies, and application case studies from important recent and current projects.

Prerequisites

Familiarity with computer graphics modeling, animation, and rendering concepts and algorithms. Knowledge of computer graphics mathematics and linear algebra is required to fully understand the theory topics.

Intended Audience

Computer graphics researchers and professionals involved in facial animation for digital characters.

Co-Organizers

Fred Pighin
Industrial Light & Magic

Lecturers

J.P. Lewis
Stanford University

George Borshukov
Electronic Arts

Chris Bregler
New York University

Parag Havaldar
Sony Pictures Imageworks

Jim Radford
Moving Picture Company

Steve Sullivan
Industrial Light & Magic

Mark Sagar
WETA Digital Ltd.

Tom Tolles
House of Moves, Inc.

Li Zhang
Columbia University

Schedule

- 8:30 am** Introduction and Overview
Pighin
- 9 am** Facial Motion Capture in Production
Havaldar and Tolles
- 10 am** Break
- 10:15 am** Facial Retargeting
Pighin and Lewis
- 11:15 am** Markerless Face Capture and Automatic Model Construction
Bregler and Zhang
- 12:15 pm** Lunch
- 1:30 pm** Performance-Driven Facial Animation at ILM
Sullivan and Hery
- 2:15 pm** Monster House
Havaldar
- 3 pm** King Kong
Sagar
- 3:30 pm** Break
- 4 pm** Virtual History and Face Robot
Radford and Kang
- 4:45 pm** Playable Universal Capture at Electronic Arts
Borshukov
- 5:15 pm** Panel on the Future of Performance-Driven Animation
Pighin, Lewis, Borshukov, Bregler, Havaldar, Radford, Sullivan, Sagar, Tolles, Zhang

Papers

interdisciplinary research achievements in the world's most prestigious presentation of current work in computer graphics and interactive techniques. Academic and industry investigators explain their ground-breaking, provocative, and important new work. After their talks, most authors are available for informal discussion of their research and its implications.

Full Conference registration allows attendees access to all SIGGRAPH 2006 Papers. Seating is on a first-come, first-served basis. Please be sure to arrive early for the Paper sessions you wish to attend.

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Ben Watson
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Yizhou Yu
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at Urbana-Champaign

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Chris Bregler
New York University

Michael F. Cohen
Microsoft Research

Daniel Cohen-Or
Tel Aviv University

Monday, 31 July

8:30 - 10:15 am
Hall C

Session Chair
Kavita Bala, Cornell University

Sampling and Ray Tracing

Ray Tracing Animated Scenes Using Coherent Grid Traversal

A SIMD packet-frustum traversal scheme for regular grids, which allows a grid-based ray tracer to achieve performance competitive with the fastest known kd-tree traversal methods. Because the grid can be rebuilt per-frame at interactive rates, this approach enables interactive ray tracing for fully animated scenes with no restrictions on the kind of motion possible.

Ingo Wald
Thiago Ize
Andrew Kensler
Aaron Knoll
Steven G. Parker
Scientific Computing and Imaging
Institute, University of Utah
wald@sci.utah.edu

Guided Visibility Sampling

This paper addresses the problem of finding triangles visible from a region in space. The proposed aggressive visibility solution uses a combination of stochastic ray shooting and geometry-guided sampling.

Peter Wonka
Arizona State University
peter.wonka@asu.edu

Michael Wimmer
Technische Universität Wien

Kaichi Zhou
Arizona State University

Stefan Maierhofer
Gerd Hesina
Zentrum für Virtual Reality und
Visualisierung

Alexander Reshetov
Intel Corporation

A Spatial Structure for Fast Poisson-Disk Sample Generation

An efficient and easy-to-implement algorithm for creating Poisson-disk point sets in linear time. This method permits the generation of very large blue-noise point sets.

Daniel Dunbar
Greg Humphreys
University of Virginia
daniel@zuster.org

Recursive Wang Tiles for Real-Time Blue Noise

An efficient technique for generating high-quality sampling patterns that match arbitrary density functions. Utilizing progressive and recursive Wang tiles allows local evaluation of infinitely large and non-periodic patterns.

Johannes Kopf
Universität Konstanz
kopf@inf.uni-konstanz.de

Daniel Cohen-Or
Tel Aviv University

Oliver Deussen
Universität Konstanz

Dani Lischinski
The Hebrew University of Jerusalem

8:30 - 10:15 am
Hall B2

Session Chair
Yizhou Yu, University of Illinois at Urbana-Champaign

Image Processing

Fast Median and Bilateral Filtering

An efficient median-filtering algorithm, up to 40 times faster than current implementations. The algorithm extends to arbitrary depth images and enables fast, high-quality bilateral filtering.

Ben Weiss
Shell & Slate Software
ben@shellandslate.com

Hybrid Images

A technique that creates displays in which the image interpretation changes with viewing distance.

Aude Oliva
Massachusetts Institute of Technology,
Department of Brain and Cognitive
Sciences
oliva@mit.edu

Antonio Torralba
Massachusetts Institute of Technology,
Computer Science and Artificial
Intelligence Laboratory

Philippe. G. Schyns
University of Glasgow

Image Deformation Using Moving Least Squares

A method for image deformation based on Moving Least Squares using various classes of functions including affine, similarity, and rigid transformations.

Scott Schaefer
Texas A&M University
sschaefer@rice.edu

Travis McPhail
Joe Warren
Rice University

Appearance-Space Texture Synthesis

Improving synthesis quality by transforming textures into low dimensional appearance spaces that capture non-local feature information. This method synthesizes anisometric textures directly into surface atlas domains, and the paper demonstrates real-time texture advection.

Sylvain Lefebvre
Hugues Hoppe
Microsoft Research
sylvain.lefebvre@laposte.net

Monday, 31 July

10:30 am – 12:15 pm
Hall C

Session Chair
Ioana Boier-Martin, IBM T.J. Watson Research Center

Shape Matching and Symmetry

A Planar Reflective Symmetry Transform for 3D Shapes

A symmetry transform that provides a measure of reflective symmetry for all planes. This paper describes efficient construction algorithms and novel applications for alignment, retrieval, segmentation, and viewpoint selection.

Joshua Podolak
Philip Shilane
Aleksey Golovinskiy
Szymon Rusinkiewicz
Thomas A. Funkhouser
Princeton University
jpodolak@cs.princeton.edu

Partial and Approximate Symmetry Detection for 3D Geometry

Stochastic clustering of local point-pair symmetry relations in transformation space allows time- and memory-efficient symmetry detection with applications in shape compression, segmentation, symmetry-consistent editing, indexing for retrieval, etc.

Niloy J. Mitra
Leonidas J. Guibas
Stanford University
niloy@stanford.edu

Mark Pauly
Eidgenössische Technische Hochschule Zürich

Reassembling Fractured Objects by Geometric Matching

Development of algorithms for automatic reassembly of fractured 3D solids. Pair- and multi-piece geometric matching is applied to digital models of the fragments to find the best globally consistent reconstruction.

Qi-Xing Huang
Tsinghua University

Simon Flöry
Technische Universität Wien

Natasha Gelfand
Stanford University

Michael Hofer
Helmut Pottmann
Technische Universität Wien

Perfect Spatial Hashing

Packing sparse data into a compact table using a perfect multidimensional hash function optimized for efficient SIMD evaluation. Applications include vector images, sprites, 3D painting, simulation, and collision detection.

Sylvain Lefebvre
Hugues Hoppe
Microsoft Research
sylvain.lefebvre@laposte.net

10:30 am – 12:15 pm
Hall B2

Session Chair
David Ebert, Purdue University

Shape Modeling and Textures

SmoothSketch: 3D Free-Form Shapes From Complex Sketches

Implementation Sketch: Implementation Details of SmoothSketch: 3D Free-Form Shapes from Complex Sketches, Page 58

A system for inferring plausible 3D free-form shapes from contour drawings. The drawings, unlike previous approaches, can be complex and contain cusps and T-junctions, and the resulting surfaces can have arbitrary topology.

Olga A. Karpenko
John F. Hughes
Brown University
koa@cs.brown.edu

Image-Based Plant Modeling

A semi-automatic technique for modeling plants directly from images. The resulting model inherits the realistic shape and complexity of a real plant.

Long Quan
Ping Tan
Gang Zeng
Lu Yuan
Jingdong Wang
The Hong Kong University of Science and Technology
quan@cs.ust.hk

Sing Bing Kang
Microsoft Research

Interactive Decal Compositing With Discrete Exponential Maps

Interactive texturing of animated implicit surfaces and point sets is made possible using a local parameterization technique based on a simple addition to Dijkstra's algorithm.

Ryan Schmidt
University of Calgary
rms@cpsc.ucalgary.ca

Cindy Grimm
Washington University in St. Louis

Brian Wyvill
University of Calgary

Procedural Modeling of Buildings

A novel shape grammar for the procedural modeling of CG architecture. The results show extensive building models of high geometric detail and visual quality.

Pascal Müller
Eidgenössische Technische Hochschule Zürich
pmueller@vision.ee.ethz.ch

Peter Wonka
Arizona State University

Simon Haegler
Andreas Ulmer
Luc Van Gool
Eidgenössische Technische Hochschule Zürich

Monday, 31 July

3:45 – 6:00 pm
Hall C

Session Chair
Alexei Efros, Carnegie Mellon University

Image Manipulation

Color Harmonization

A method that enhances the harmony among the colors of a given image, thus improving its “look-and-feel.” Harmonization is especially useful for adjusting the colors of an image that is composed of several parts taken from different sources.

Daniel Cohen-Or
Olga Sorkine
Ran Gal
Tommer Leyvand
Tel Aviv University
sorkine@tau.ac.il

Ying-Qing Xu
Microsoft Research Asia

Drag-and-Drop Pasting

Using this method, with a simple outlining of yourself in the source image followed by dragging-and-dropping, you will be seamlessly keyed into your desired scenes.

Jiaya Jia
Chinese University of Hong Kong
leojia@cse.cuhk.edu.hk

Jian Sun
Microsoft Research Asia

Chi-Keung Tang
Hong Kong University of Science and Technology

Heung-Yeung Shum
Microsoft Research Asia

Two-Scale Tone Management for Photographic Look

Combining nonlinear decomposition and frequency analysis to enhance photographs by controlling their tonal balance and texture level. Masterpieces are used as models to produce compelling renditions of casual shots.

Soonmin Bae
Sylvain Paris
Frédo Durand
Massachusetts Institute of Technology,
Computer Science and Artificial
Intelligence Laboratory
soonmin@csail.mit.edu

Image Manipulation (continued)

Interactive Local Adjustment of Tonal Values

A new interactive tool for the digital darkroom that uses a simple, intuitive stroke-based interface for local adjustment of tonal values and other visual parameters, in both ordinary and HDR images, as well as a novel tone-mapping operator that supports further adjustment and refinement.

Dani Lischinski
Zeev Farbman
The Hebrew University of Jerusalem
danix@cs.huji.ac.il

Matt Uyttendaele
Rick Szeliski
Microsoft Research

Image-Based Material Editing

Given only a single high-dynamic-range image as input, this method replaces materials of objects in the image with completely different materials.

Erum Arif Khan
University of Central Florida
ekhan@cs.ucf.edu

Erik Reinhard
University of Bristol

Roland W. Fleming
Heinrich Bühlhoff
Max-Planck-Institut für biologische
Kybernetic

Tuesday, 1 August

8:30 - 10:15 am
Hall C

Session Chair
Leif P. Kobbelt, RWTH Aachen University

Surfaces

Real-Time GPU Rendering of Piecewise Algebraic Surfaces

Direct rendering of Bézier tetrahedra by specially encoding coefficient data on vertices and rasterizing faces. A pixel shader then robustly solves the (up to fourth-order) equations using analytic techniques.

Charles Loop
Jim Blinn
Microsoft Research
cloop@microsoft.com

Point-Sampled Cell Complexes

Point samples define the geometry of independent surface patches, curve segments, and corners, which are glued together based on explicit connectivity information, forming a piecewise smooth surface with features.

Anders Adamson
Technische Universität Darmstadt

Marc Alexa
Technische Universität Berlin
marc@cs.tu-berlin.de

Geometric Modeling With Conical Meshes and Developable Surfaces

Conical meshes are quadrilateral meshes with planar faces that discretize the principal curvature lines. This paper studies their remarkable geometry and computation in combination with subdivision, and presents applications in architectural design.

Yang Liu
University of Hong Kong

Helmut Pottmann
Johannes Wallner
Technische Universität Wien
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Yong-Liang Yang
Tsinghua University

Wenping Wang
University of Hong Kong

Mesh Quilting for Geometric Texture Synthesis

A novel geometry texture synthesis algorithm, called mesh quilting, that seamlessly synthesizes a 3D texture sample given in the form of a triangle mesh over arbitrary surfaces.

Kun Zhou
Xin Huang
Xi Wang
Microsoft Research Asia
kunzhou@microsoft.com

Yiyi Tong
Mathieu Desbrun
California Institute of Technology

Baining Guo
Heung-Yeung Shum
Microsoft Research Asia

10:30 am - 12:15 pm
Hall C

Session Chair
Greg Ward, BrightSide Technologies

HDR and Systems

High-Dynamic-Range Texture Compression for Graphics Hardware

New compression schemes for HDR textures designed for graphics hardware. At a fixed rate of 8 bits per pixel, this method obtains results virtually indistinguishable from uncompressed HDR textures.

Jacob Munkberg
Patrik Claarberg
Jon Hasselgren
Tomas Akenine-Möller
Lunds Universitet
jacob@cs.lth.se

High-Dynamic-Range Texture Compression

A novel compression scheme for high-dynamic-range textures, targeted for hardware implementation. 6:1 compression is achieved with high image fidelity and a very straightforward decoding logic.

Kimmo Roimela
Tomi Aarnio
Joonas Itäranta
Nokia Research Center
kimmo.roimela@nokia.com

Backward Compatible High-Dynamic-Range MPEG Video Compression

Video of dynamic range up to 15 log-10 units is decomposed into a tone-mapped stream and a small residual stream. An HDR model of human visual perception is used to improve compression performance.

Rafal Mantiuk
Alexander Efremov
Karol Myszkowski
Hans-Peter Seidel
Max-Planck-Institut für Informatik
mantiuk@mpi-sb.mpg.de

The Direct3D 10 System

A system architecture for fourth-generation programmable graphics processing units (GPUs). New pipeline stages for primitive generation and memory streaming are described along with motivation for other architecture decisions.

David Blythe
Microsoft Corporation
dbythe@microsoft.com

Tuesday, 1 August

1:45 - 3:30 pm
Hall C

Session Chair
Holly Rushmeier, Yale University

Appearance Representation

Inverse Shade Trees for Non-Parametric Material Representation and Editing

Techniques for decomposing measured appearance datasets into intuitive shade trees. This framework supports data-driven representation of the SVBRDF that supports interactive rendering and editing.

Jason Lawrence
Princeton University
jlawrenc@cs.princeton.edu

Aner Ben-Artzi
Columbia University

Christopher DeCoro
Princeton University

Wojciech Matusik
Hanspeter Pfister
Mitsubishi Electric Research Laboratories (MERL)

Ravi Ramamoorthi
Columbia University

Szymon Rusinkiewicz
Princeton University

A Compact Factored Representation of Heterogeneous Subsurface Scattering

A method for capturing the heterogeneous subsurface scattering of a variety of real-world samples, measuring spatial variation using a camera-projector setup. A novel factored representation enables compact storage and efficient rendering.

Pieter Peers
Karl vom Berge
Katholieke Universiteit Leuven
Pieter.Peers@cs.kuleuven.ac.be

Wojciech Matusik
Mitsubishi Electric Research Laboratories (MERL)

Ravi Ramamoorthi
Columbia University

Jason Lawrence
Szymon Rusinkiewicz
Princeton University

Philip Dutré
Katholieke Universiteit Leuven

Appearance Manifolds for Modeling Time-Variant Appearance of Materials

Appearance manifolds is a visual simulation technique for modeling the time-variant surface appearance of a material from data captured at a single instant in time.

Jiaping Wang
Institute of Computing Technology,
Chinese Academy of Sciences

Xin Tong
Steve Lin
Microsoft Research Asia

Minghao Pan
Zhejiang University

Chao Wang
Tsinghua University

Hujun Bao
Zhejiang University

Baining Guo
Heung-Yeung Shum
Microsoft Research Asia

Time-Varying Surface Appearance: Acquisition, Modeling, and Rendering

This work proposes a systematic study of various kinds of time-varying surface appearance including acquisition of a database, space-time appearance factorization (STAF) model, and some novel rendering applications based on the STAF model such as texture synthesis, time extrapolation, control, and transfer.

Jinwei Gu
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Chien-i Tu
Mitsubishi Electric Research Laboratories (MERL)

Ravi Ramamoorthi
Peter Belhumeur
Columbia University

Wojciech Matusik
Mitsubishi Electric Research Laboratories (MERL)

Shree K. Nayar
Columbia University

3:45 - 5:30 pm
Hall C

Session Chair
Paul Debevec, USC Centers for Creative Technologies

Matting and Deblurring

Flash Matting

Pick up a camera and a flash, extract hairy and furry things from photos. The Joint Bayesian Flash Matting is a powerful and practical natural image matting technique for everyone!

Jian Sun
Yin Li
Sing Bing Kang
Heung-Yeung Shum
Microsoft Research Asia
jiansun@microsoft.com

Natural Video Matting Using Camera Arrays

Using statistics derived from images from a camera array, this method computes alpha mattes for natural scenes with textured backgrounds. The algorithm is automatic and runs at near real-time rates.

Neel Joshi
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Wojciech Matusik
Shai Avidan
Mitsubishi Electric Research Laboratories (MERL)

Removing Camera Shake From a Single Photograph

Camera shake, in which an unsteady camera causes blurry photographs, is a chronic problem for photographers. This paper introduces an algorithm to remove these effects from seriously blurred images.

Rob Fergus
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Computer Science and Artificial Intelligence Laboratory
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Aaron Hertzmann
Sam T. Roweis
University of Toronto

William T. Freeman
Massachusetts Institute of Technology,
Computer Science and Artificial Intelligence Laboratory

Coded Exposure Photography: Motion Deblurring Using Fluttered Shutter

This method flutters the camera shutter open and closed with a binary pseudo-random sequence during exposure. Fast-moving objects are blurred, but sequenced shuttering preserves all spatial frequencies, simplifying the deblurring process.

Ramesh Raskar
Amit Agrawal
Mitsubishi Electric Research Laboratories (MERL)
raskar@merl.com

Jack Tumblin
Northwestern University

Wednesday, 2 August

8:30 - 10:15 am
Hall C

Session Chair
Ming Lin, University of North Carolina at Chapel Hill

Fluids

Efficient Simulation of Large Bodies of Water by Coupling Two- and Three-Dimensional Techniques

An adaptive water simulation method that uses uniform cells in a band near the interface and represents the remaining fluid with tall, vertical cells similar to shallow water.

Geoffrey Irving
Stanford University and
Pixar Animation Studios
irving@cs.stanford.edu

Eran Guendelman
Stanford University

Frank Losasso
Ronald Fedkiw
Stanford University and
Industrial Light & Magic

Multiple Interacting Liquids

A novel multiple-particle level set method that enables simulation of an arbitrary number of fluid regions undergoing complex interactions.

Frank Losasso
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Industrial Light & Magic
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Tamar Shinar
Stanford University

Andrew Selle
Stanford University
and Intel Corporation

Ronald Fedkiw
Stanford University and
Industrial Light & Magic

Fluid Animation With Dynamic Meshes

A method for animating fully coupled fluids and rigid bodies using dynamically changing tetrahedral meshes.

Bryan M. Klingner
Bryan E. Feldman
Nuttapong Chentanez
James F. O'Brien
University of California, Berkeley
klingner@cs.berkeley.edu

Model Reduction for Real-Time Fluids

This model reduction approach to fluid dynamics enables real-time simulation of 3D flows with interactively moving objects.

Adrien Treuille
Andrew Lewis
University of Washington
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Zoran Popović
University of Washington
and Electronic Arts

8:30 - 10:15 am
Hall B2

Session Chair
Wojciech Matusik, Mitsubishi Electric Research Laboratories (MERL)

Image Collections

Photo Tourism: Exploring Photo Collections in 3D

A system for interactively touring and annotating world sites in a 3D explorer, leveraging massive internet photo databases and large personal photo collections to construct browsable scene models.

Noah Snavely
Steven M. Seitz
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snavely@cs.washington.edu

Richard Szeliski
Microsoft Research

AutoCollage

An automatic procedure for constructing a visually appealing collage from a collection of input images, thanks to novel techniques for optimal packing, object recognition, and Poisson alpha blending.

Carsten Rother
Lucas Bordeaux
Youssef Hamadi
Andrew Blake
Microsoft Research Cambridge
carrot@microsoft.com

Photographing Long Scenes With Multi-Viewpoint Panoramas

Production of seamless multi-viewpoint panoramas of scenes that are too long to capture from a single viewpoint, such as city streets. The panoramas are composed from sparse sets of handheld photographs.

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Maneesh Agrawala
University of California, Berkeley

Michael F. Cohen
Microsoft Research

David Salesin
University of Washington and Adobe
Systems Incorporated

Richard Szeliski
Microsoft Research

Schematic Storyboarding for Video Visualization and Editing

Employing the visual language of storyboards to visualize short video clips using a single annotated image. Applications include video indexing and editing, surveillance summarization, and composition of graphic novels.

Dan B. Goldman
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David Salesin
University of Washington and Adobe
Systems Incorporated

Steven M. Seitz
University of Washington

Wednesday, 2 August

10:30 am - 12:15 pm
Hall C

Session Chair
Doug L. James, Carnegie Mellon University

Motion Capture

Interaction Capture and Synthesis

Interaction Capture extends motion capture to explicitly include the capture of contact phenomena. To synthesize new interaction, this method uses estimates of intended motion and passive response to contact in a physically based simulation.

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EVASION/INRIA
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Dinesh K. Pai
Rutgers University and The University of
British Columbia

Capturing and Animating Skin Deformation in Human Motion

Using a commercial motion capture system and a very large marker set, this technique captures and animates dynamic skin deformation such as bending, bulging, jiggling, and stretching.

Sang Il Park
Jessica K. Hodgins
Carnegie Mellon University
sipark@cs.cmu.edu

Compression of Motion Capture Databases

A lossy compression algorithm for large databases of motion capture data. This method can compress 1080MB of motion capture data into 35.5MB (30:1 compression ratio) with little visible degradation while maintaining fast compression and decompression.

Okan Arikan
University of Texas at Austin
okan@cs.utexas.edu

Motion Patches: Building Blocks for Virtual Environments Annotated With Motion Data

Motion patches allow control of a crowd of animated characters in a large, complex virtual environment constructed using a set of building blocks.

Kang Hoon Lee
Myeong Geol Choi
Jehee Lee
Seoul National University
jehee@mri.snu.ac.kr

10:30 am - 12:15 pm
Hall B2

Session Chair
Szymon Rusinkiewicz, Princeton University

Image Capture

Projection Defocus Analysis for Scene Capture and Image Display

This work proposes a linear model for projector defocus. The model is used to exploit projector defocus to achieve robust 3D reconstructions of scenes as well as compensate for projector defocus to achieve depixelation and focused projection at multiple depths.

Li Zhang
Shree K. Nayar
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Multiview Radial Catadioptric Imaging for Scene Capture

This work proposes a family of radial imaging systems that use a camera and a curved mirror to capture a scene from multiple viewpoints, within a single image. The proposed systems are used to recover 3D structure, capture complete texture maps, and estimate BRDFs.

Sujit Kuthirummal
Shree K. Nayar
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Light Field Microscopy

By inserting a microlens array into a microscope, one can capture light fields of tiny objects in a single photograph. From these light fields, one can compute perspective flybys, focal stacks, and volume datasets.

Marc Levoy
Ren Ng
Andrew Adams
Matthew Footer
Mark Horowitz
Stanford University
levoy@cs.stanford.edu

Fast Separation of Direct and Global Components of a Scene Using High Frequency Illumination

This work proposes a fast capture method for separating a scene into its direct and global illumination components. The method can handle a variety of global effects including inter-reflections, subsurface scattering, and volumetric scattering.

Shree K. Nayar
Gurunandan Krishnan
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Michael D. Grossberg
City University of New York

Ramesh Raskar
Mitsubishi Electric Research
Laboratories (MERL)

Wednesday, 2 August

3:45 - 6 pm
Hall C

Session Chair
Fabio Pellacini, Dartmouth College

Precomputed Transfer

Real-Time BRDF Editing in Complex Lighting

This paper introduces the capability to edit material properties of objects in a scene, while providing real-time feedback of the effects of those edits in images rendered with complex lighting and cast shadows.

Aner Ben-Artzi
Ryan Overbeck
Ravi Ramamoorthi
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aner@cs.columbia.edu

Generalized Wavelet Product Integral for Rendering Dynamic Glossy Objects

Implementation Sketch: Inside Just-In-Time Radiance Transfer, Page 70

This paper considers fast computation of two basic problems: multi-function product integral and its dual, product of multiple functions, with a practical application in real-time lighting design.

Weifeng Sun
Amar Mukherjee
University of Central Florida
wsun@cs.ucf.edu

All-Frequency Precomputed Radiance Transfer Using Spherical Radial Basis Functions and Clustered Tensor Approximation

This paper introduces a new data representation and compression technique for all-frequency precomputed radiance transfer. The work successfully achieves compact storage space and real-time rendering performance in dynamic lighting environments.

Yu-Ting Tsai
Zen-Chung Shih
National Chiao Tung University
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Precomputed Transfer (continued)

Real-Time Soft Shadows in Dynamic Scenes Using Spherical Harmonic Exponentiation

Rendering soft shadows from low-frequency lighting in real time within dynamic scenes including moving characters. Blockers are approximated as sphere sets whose visibility is accumulated in log space.

Zhong Ren
Rui Wang
Zhejiang University

John Snyder
Microsoft Research

Kun Zhou
Xinguo Liu
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Bo Sun
Columbia University

Peter-Pike Sloan
Microsoft Corporation

Hujun Bao
Qunsheng Peng
Zhejiang University

Baining Guo
Microsoft Research Asia

Precomputed Acoustic Transfer: Output-Sensitive, Accurate Sound Generation for Geometrically Complex Vibration Sources

A new precomputation-based algorithm for efficient (real-time) computation of spatially varying sound pressure from geometrically complex objects undergoing harmonic vibrations.

Doug L. James
Jernej Barbic
Carnegie Mellon University
djames@cs.cmu.edu

Dinesh K. Pai
Rutgers University and The University of British Columbia

Thursday, 3 August

8:30 - 10:15 am
Hall C

Session Chair
Philip Dutré, Katholieke Universiteit Leuven

Appearance Modeling

Photorealistic Rendering of Rain Streaks

This work presents a model for rain-streak appearance that captures the complex interactions between the oscillating shape of a falling raindrop and the lighting and viewing directions. The model is used to add photorealistic rain streaks to a user provided image or video.

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Shree K. Nayar
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Acquiring Scattering Properties of Participating Media by Dilution

This work presents the first-of-its-kind dataset of the scattering properties of 40 commonly available media such as wines, beers, juices, beverages, cleaning supplies, and ocean water, allowing for photo-realistic renderings of such media. The key idea is to dilute each medium sufficiently with water to simplify light transport.

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Craig Donner
University of California, San Diego

Ravi Ramamoorthi
Shree K. Nayar
Columbia University

Henrik Wann Jensen
University of California, San Diego

Analysis of Human Faces Using a Measurement-Based Skin Reflectance Model

Implementation Sketch: Processing and Editing of Faces Using a Measurement-Based Skin Reflectance Model, Page 69

A novel skin-reflectance model whose parameters can be estimated from measurements. Analysis of the model parameters for a sample population reveals variations according to age, gender, and skin type.

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Wojciech Matusik
Hanspeter Pfister
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Bernd Bickel
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Craig Donner
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Chien Tu
Janet McAndless
Mitsubishi Electric Research Laboratories (MERL)

Jinho Lee
Atlantis Corp.

Addy Ngan
Massachusetts Institute of Technology

Henrik Wann Jensen
University of California, San Diego

Markus Gross
Eidgenössische Technische Hochschule Zürich

A Statistical Model for Synthesis of Detailed Facial Geometry

A generative statistical model of fine-scale facial details (pores and small wrinkles). In this paper, the model is used to add detail to low-resolution face scans, sharpen interpolated faces, and age or de-age faces.

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Wojciech Matusik
Hanspeter Pfister
Mitsubishi Electric Research Laboratories (MERL)

Szymon Rusinkiewicz
Thomas A. Funkhouser
Princeton University

Thursday, 3 August

8:30 - 10:15 am
Hall B2

Session Chair
Joe Warren, Rice University

Meshes

Modified Subdivision Surfaces With Continuous Curvature

A simple algorithm that modifies Catmull Clark surfaces near extraordinary points. The modified surfaces are C2-continuous and exhibit better curvature behavior.

Adi Levin
Cadent Ltd.
adi.levin@cadent.co.il

Edge Subdivision Schemes and the Construction of Smooth Vector Fields

An intrinsic method of generating smooth 1-forms/vector fields through edge subdivision on simplicial surfaces of arbitrary topology. The method integrates well with subdivision surfaces and has a simple and intuitive design methodology.

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Weiwei
Yiyong Tong
Mathieu Desbrun
Peter Schröder
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Streaming Computation of Delaunay Triangulations

Adding spatial finalization tags to a point stream enables fast out-of-core Delaunay triangulation. On a household laptop, this method triangulates 500 million points into a billion-triangle terrain in one hour using 100 MB memory.

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Yuanxin Liu
University of North Carolina at Chapel Hill

Jonathan Shewchuk
University of California, Berkeley

Jack Snoeyink
University of North Carolina at Chapel Hill

Spectral Surface Quadrangulation

SSQ automatically converts triangulated surfaces into meshes composed exclusively of quadrilaterals and very few extraordinary points. It does this by extracting the Morse-Smale complex of a carefully chosen Laplacian eigenvector.

Shen Dong
Peer-Timo Bremer
Michael Garland
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Valerio Pascucci
Lawrence Livermore National Laboratory

John C. Hart
University of Illinois, Urbana-Champaign

10:30 am - 12:15 pm
Hall C

Session Chair
Ravi Ramamoorthi, Columbia University

Light Transport

Simulating Multiple Scattering in Hair Using a Photon-Mapping Approach

Physically accurate rendering of hair volumes requires simulation of multiple scattering. This paper proposes a 5D photon-mapping approach that efficiently approximates the contribution of multiple scattering in hair.

Jonathan T. Moon
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Statistical Acceleration for Animated Global Illumination

Acceleration of animated indirect illumination computations by rendering fast but noisy solutions followed by statistics-based denoising. The resulting animation has low computational cost and reduced noise.

Mark Meyer
John Anderson
Pixar Animation Studios
mmeyer@pixar.com

Multidimensional Lightcuts

Multidimensional lightcuts efficiently and scalably render sophisticated effects including motion blur, depth of field, antialiasing, and volume scattering. Key components include an implicit hierarchy, analytic bounds, and a perceptual metric.

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Adam Arbree
Kavita Bala
Donald P. Greenberg
Cornell University
bjw@graphics.cornell.edu

Direct-to-Indirect Transfer for Cinematic Relighting

A real-time GPU relighting engine for multiple-bounce indirect illumination supporting complex scenes and procedural light shaders. The method efficiently precomputes and compresses the transfer from direct to indirect illumination.

Miloš Hašan
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Fabio Pellacini
Dartmouth College

Kavita Bala
Cornell University

Thursday, 3 August

10:30 am - 12:15 pm
Hall B2

Session Chair
Marc Alexa, Technische Universität Berlin

Shape Deformation

Editing Arbitrarily Deforming Surface Animations

A system for interactively editing non-rigid free-form surface animations, such as of cloth. It enables extensive customization and retargeting of existing motion, both simulated and captured.

Scott Kircher
Michael Garland
University of Illinois at Urbana-Champaign
kircher@uiuc.edu

A Fast Multigrid Algorithm for Mesh Deformation

A very fast multigrid technique for deforming large surface and volume meshes. It is ideal for interactive mesh manipulation and efficient production of animated mesh sequences.

Lin Shi
Yizhou Yu
Nathan Bell
Wei-Wen Feng
University of Illinois at Urbana-Champaign
yizhou05@gmail.com

Vector-Field-Based Shape Deformations

An approach to defining shape deformations using divergence free vector fields. By performing a path line integration of mesh vertices, a volume-preserving deformation without self intersections is obtained.

Wolfram von Funck
Holger Theisel
Hans-Peter Seidel
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Subspace Gradient Domain Mesh Deformation

A gradient-domain mesh deformation technique that is capable of robustly and efficiently solving linear and non-linear constraints, including skeleton and volume constraints.

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Zhejiang University

Xinguo Liu
Kun Zhou
Li-Yi Wei
Microsoft Research Asia
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Shang-Hua Teng
Boston University

Hujun Bao
Zhejiang University

Baining Guo
Heung-Yeung Shum
Microsoft Research Asia

1:45 - 3:30 pm
Hall C

Session Chair
John Snyder, Microsoft Research

Numerical and Geometric Algorithms and Crowds

Locally Adapted Hierarchical Basis Preconditioning

An adaptive multi-level preconditioner for rapidly solving inhomogeneous first-order interpolation and reconstruction problems that arise in computer graphics and computer vision.

Richard Szeliski
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Fast Proximity Computation Among Deformable Models Using Discrete Voronoi Diagrams

Implementation Sketch: Fast Proximity Computation Among Deformable Models Using Discrete Voronoi Diagrams, Page 70

Novel algorithms to perform collision and distance queries among deformable models in complex environments. This paper demonstrates significant speedups over prior techniques on cloth simulation and breaking-object scenarios.

Avneesh Sud
Naga Govindaraju
Russell Gayle
Ilknur Kabul
Dinesh Manocha
University of North Carolina at Chapel Hill
sud@cs.unc.edu

Resolving Surface Collisions Through Intersection Contour Minimization

A simple and easy-to-implement method for resolving intersections between colliding surfaces by inducing relative displacements that minimize the length of intersection contours.

Pascal Volino
Nadia Magnenat-Thalmann
L'Université de Genève
pascal@miralab.unige.ch

Continuum Crowds

A crowd model based on continuum dynamics rather than agent rules. Our system runs at interactive rates, exhibits smooth flow, and produces emergent phenomena observed in real crowds.

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Zoran Popović
University of Washington and Electronic Arts

Thursday, 3 August

1:45 - 3:30 pm
Hall B2

Session Chair
Dinesh K. Pai, Rutgers University and The University of British Columbia

Animation

The Cartoon Animation Filter

A simple filter that takes an arbitrary input motion signal and modulates it so that the output motion is more “alive” or “animated.”

Joe Wang
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Steven M. Drucker
Microsoft Research

Maneesh Agrawala
University of California, Berkeley

Michael F. Cohen
Microsoft Research

Inverse Kinematics for Reduced Deformable Models

This method allows direct and intuitive manipulation of highly detailed meshes at interactive rates. Deformations are expressed in terms of a reduced deformable model constructed automatically from example shapes.

Kevin G. Der
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Robert W. Sumner
Eidgenössische Technische Hochschule Zürich

Jovan Popović
Massachusetts Institute of Technology

Super-Helices for Predicting the Dynamics of Natural Hair

A deformable model for hair derived from the theory of elastic rods. Various hairstyles (from straight to curly and short to long) are animated and validated against experiments.

Florence Bertails
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Basile Audoly
Audoly Consulting
LMM/CNRS et Université Pierre et Marie Curie

Marie-Paule Cani
EVASION/INRIA

Bernard Querleux
Frédéric Leroy
L'Oréal Recherche, Aulnay-Sous-Bois

Jean-Luc Lévêque
L'Oréal Recherche, Clichy

Heads Up! Biomechanical Modeling and Neuromuscular Control of the Neck

A muscle-actuated biomechanical model of the human head-and-neck system, which has been overlooked in the animation literature, and a neuromuscular control model for dynamic head animation.

Sung-Hee Lee
Demetri Terzopoulos
University of California, Los Angeles
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3:45 - 5:30 pm
Hall C

Session Chair
Aaron Hertzmann, University of Toronto

Non-Photorealistic Rendering

Exaggerated Shading for Depicting Shape and Detail

An interactive non-photorealistic 3D renderer that conveys shape while emphasizing detail at all surface orientations. It adjusts the light direction locally and combines non-linear shading computations across scales.

Szymon Rusinkiewicz
Michael Burns
Princeton University
smr@princeton.edu

Doug DeCarlo
Rutgers University

Image Enhancement by Unsharp Masking the Depth Buffer

This method uses the difference between the depth buffer and a Gaussian filtered version of the depth buffer to determine spatially important edges in a rendered image. Colors, contrast, and other properties of the image can then be enhanced.

Thomas Luft
Carsten Colditz
Oliver Deussen
Universität Konstanz
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Manga Colorization

Manga employs rich amounts of screening and hatching that make computer-aided colorization difficult. This paper proposes a pattern-based colorization to colorize black-and-white manga while retaining the original artists' style.

Yingge Qu
Tien-Tsin Wong
Pheng-Ann Heng
The Chinese University of Hong Kong
ttwong@acm.org

Real-Time Video Abstraction Implementation Sketch: Implementing Real-Time Video Abstraction, Page 66

An automatic real-time abstraction framework to produce cartoon-like videos. This work is based on several image processing algorithms that have been modified for parallel implementation, extensibility, and increased temporal coherence.

Holger Winnemöller
Sven C. Olsen
Bruce Gooch
Northwestern University
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Panels

interrogate the experts and disagree with their detractors. Panelists present brief statements about the issues that energize the computer graphics community, debate the topics, and answer questions from the audience.

Panelist position papers are presented in the Full Conference DVD-ROM.

Full Conference and Conference Select registrations allows attendees access to all Panels. Seating is on a first-come, first-served basis. Please be sure to arrive early for Panel sessions you wish to attend.

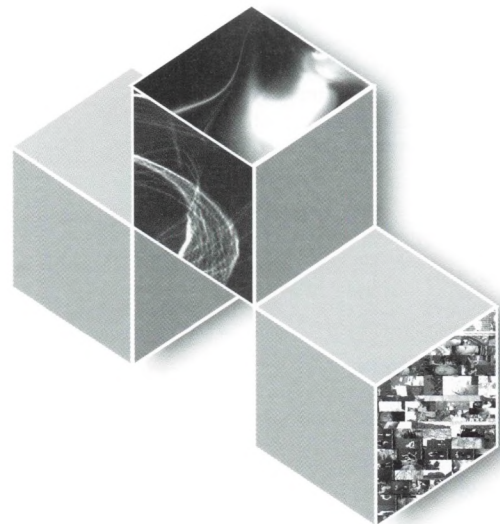
Panels Committee

David (grue) DeBry
Panels Chair
Electronic Arts, Inc.

Catherine Davenport
XSV: Ex-Student Volunteer
Big Spaceship

Gil Irizarry
Conoa

Michael Koperwas
Industrial Light & Magic



Monday, 31 July

3:45 - 5:30 pm
Room 253

Digital Rights, Digital Restrictions

The internet, with its widening bandwidth and accelerating speed, allows people throughout the world to exchange immense amounts of digital information. Not only can people share their home movies. They can also share movies that they didn't make and didn't even pay for. Music companies and movie studios have tried to clamp down on piracy with laws like the Digital Millennium Copyright Act (DMCA) and lawsuits against people they believe are stealing their products. When DJ Danger Mouse released "The Grey Album" (a remix of Jay-Z's "The Black Album" and The Beatles' "The White Album") on the web, sites that distributed the music received a cease-and-desist notice from EMI. Then Sony joined in with Digital Millennium Copyright Act (DMCA) takedown notices. Is this sort of mashup legal? Should it be? Is the DMCA the correct way to protect art? Is restricting the creativity of artists justified when the art of others is involved? Hardware and software manufacturers, working with movie studios, record studios, and other content providers, are releasing systems with Digital Rights Management (DRM). These products limit how and when content (text, audio, and video) can be viewed and copied. Is DRM a reasonable response to corporate concerns about piracy and mashing? Is restricting the customer's ability to play a movie using a non-DRM player, television, or stereo a fair move to prevent theft? Will everyone be forced to upgrade to see next year's movies? Some companies are trying a more active approach: Sony recently added copy-protection software on some of their audio CDs. This "rootkit" software installs itself without telling the user, hides its own contents, and examines what other programs are running on the computer. Is unannounced software installation reasonable? If the software is sending information across the internet to another party, is that reasonable? Where is the line drawn, and who gets to draw it?

Panelists

Robert Ryang
P.S. 260

Karen Sandler
Software Freedom Law Center

Mitch Singer
Sony Pictures Entertainment

Emru Townsend
FPS Magazine

Tuesday, 1 August

10:30 am - 12:15 pm
Room 210

Is a Career in Computer Graphics Possible? Part 1: Skills and Training

How can anyone keep up with the rapid advances in our field? Employees who want to stay current with new technologies and techniques must find a balance with their daily work schedule. If you can't keep up, will you stay employed? Are schools able to represent the environment students will eventually find in the field? What skill sets are most valuable? Is it better to be a generalist or a specialist? How much should new employees be expected to know, and how much should they expect to be trained on the job? Is it worth it for employers to help keep their employees trained, or are they better off just hiring people who are on the cutting edge? Are training departments able to keep up with the demands of employees who are on shortened schedules? Is becoming obsolete inevitable? Or are there strategies for staying current?

Panelists

Chryssa Cooke
Ex'pression College for Digital Arts

Greg Maloney
Industrial Light & Magic

Ken Maruyama
Sony Pictures Imageworks

1:45 - 3:30 pm
Room 157

So You Want to Create Content: Licenses, Copyrights, and Other Things to Think About

Licensing in the digital world once meant deciding between open and proprietary licenses. Later, producing free content meant deciding between "free as in beer" and "free as in speech." Today, there is a vast array of licensing and copyright schemes, each with a different view of what's protected and what's not. Why do we need so many schemes? Are they really useful? Do you understand the difference between copyleft and Creative Commons? More schemes are coming, most notably the new GPL version 3. Why create a new licensing scheme? What's left out of today's schemes that tomorrow's will cover? As software developers and content creators, should we "share the wealth" or "protect our wealth?"

Panelists

Andy Luckey
Greater Family, LLC

Gary Morris
Kenyon & Kenyon, LLP

Gregory Silberman
Kaye Scholer, LLP

inter

Tuesday, 1 August

3:45 - 5:30 pm
Room 253

Ethics in Image Manipulation

For a very small investment, anyone can access the tools required to make significant yet undetectable changes to photographs and other images. The SIGGRAPH community can take much of the credit for this amazing progress. Should we also take the responsibility? Should SIGGRAPH get more involved in public policy? Some recent examples of significant unethical applications:

- During the OJ Simpson investigation, both *Time* and *Newsweek* ran Simpson's mug shot on their covers, in the same week. But *Time* doctored the photo to make Mr. Simpson look darker, blurrier, and more sinister.
- In 2004, the Bush presidential campaign admitted that it digitally duplicated soldiers to change the appearance of a campaign-event photo.
- During the 2000 New Year's Eve celebration, CBS digitally replaced the NBC logo on the Times Square Jumbotron with their own logo.

Image manipulation is essential in the visual effects industry, but it is discouraged in research and journalism. And there are many gray areas. When is image manipulation appropriate? How should the SIGGRAPH community respond to unethical applications of what we have created? Where do we draw the line, and should we draw it? How do we teach these ethics to our students?

Panelists

Kathryn Carlson
Fluid Effect

Brian DeLevie
University of Colorado at Denver

Aude Oliva
Massachusetts Institute of Technology

Wednesday, 2 August

10:30 am - 12:15 pm
Room 210

Video Games: Content and Responsibility

Since their invention, video games have been accused of many things, including:

- Male-focused stories and design
- Excessive violence
- Promoting addiction to digital entertainment
- Distorting attention spans

Of course, the same complaints have been made about radio, television, the internet, and computers in general. Are all or any of these concerns valid? When will someone write games that girls want to play, or has it already been done? Do fun and educational video games exist? Do video games train people to be violent, or do they provide a safe way to vent violent tendencies? Does the ESRB rating system go too far, or not far enough? Are game developers and publishers taking enough responsibility for their creations? Are consumers using their products responsibly?

Panelists

Jonathan Cho Yan Chan
University of Hong Kong

Jason Della Rocca
International Game Developers Association

Tamsen Mitchell
Shaba Games, Inc.

David Walsh
National Institute for Media and the Family

3:45 - 5:30 pm
Room 210

Is a Career in Computer Graphics Possible? Part 2: Dedication and Expectation

Is our work environment becoming as ephemeral as our work? Companies are demanding more of our time, making permanent crunch time a possible future. Can companies stay profitable while avoiding massive overtime, or are class-action lawsuits by employees going to proliferate? Or is that impossible? Should we just learn to live with serious stress and eventual burnout? How have employers and employees who have been in this business for many years survived? What can all of us (companies, employers, researchers, developers, artists, students) do to make sure that sane and stable jobs exist for us in computer graphics?

Panelists

Jenny Fulle
Sony Pictures Imageworks

Kevin Koch
The Animation Guild, IATSE Local 839

Henry LaBounta
Electronic Arts

face

Locations

Hall B2, Hall C, Rooms 110, 157, 205, 210, 253, 258

Days & Hours

Monday, 31 July

10:30 am – 12:15 pm

3:45 – 5:30 pm

Tuesday, 1 August

8:30 am – 5:30 pm

Wednesday, 2 August

8:30 am – 5:30 pm

Thursday, 3 August:

8:30 am – 5:30 pm

Sketches

Sketch authors present new and thought-provoking ideas, techniques, and applications in academic research, industrial development, filmmaking, art, and enhanced realities. Following each sketch presentation, authors answer questions and discuss future implications of their work.

Companion Sketches

Art Gallery Sketches – see page 93 – 97.

Computer Animation Festival Sketches – see page 105.

Emerging Technologies Sketches – see page 112 – 113.

Sketches Committee

Hanspeter Pfister

Sketches Chair

Mitsubishi Electric Research Laboratories (MERL)

Marc Alexa

SIGGRAPH 2006 Sketches & Posters Co-Chair

Technische Universität Berlin

Kevin Bjorke

NVIDIA Corporation

Robert Bridson

The University of British Columbia

Steve Derrick

Vicarious Visions

Margaret Dolinsky

Indiana University

François Guimbretière

University of Maryland, College Park

Diego Gutiérrez

Universidad de Zaragoza

Wendy Ju

Stanford University

Joe Kniss

University of Utah

Caroline Larboulette

XSV: Ex-Student Volunteer

Vienna University of Technology

Daniel Maskit

Digital Domain

Mike McGuffin

University of Toronto

Bonnie Mitchell

SIGGRAPH 2006 Art Gallery Chair

Bowling Green State University

Ken Perlin

New York University

Steven Schkolne

California Institute of the Arts

Apurva Shah

Pixar Animation Studios

Karan Singh

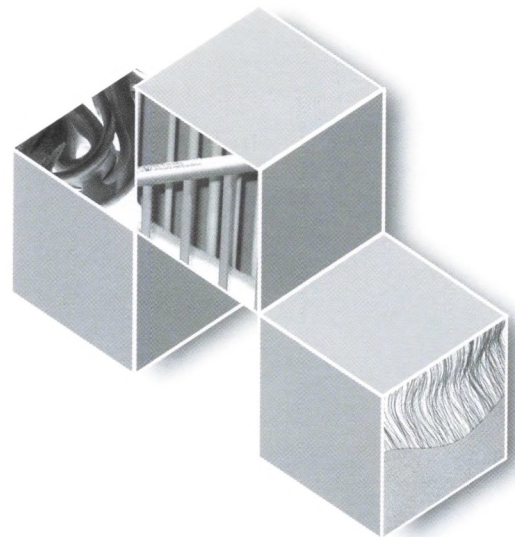
University of Toronto

Mark VandeWettering

Pixar Animation Studios

Daniel Wexler

NVIDIA Corporation



Monday, 31 July

10:30 am - 12:15 pm

Room 253

Reprise of UIST, I3D, and Sandbox: The Videogame Symposium

The User-Interface Software and Technology Symposium, the Symposium on Interactive 3D Graphics and Games, and Sandbox: An ACM Video Game Symposium are sponsored by ACM SIGGRAPH. This session presents abbreviated highlights from this year's symposia.

UIST 2006 Papers

Interacting With Large Displays
From a Distance With Vision-
Tracked Multi-Finger Gestural
Input

Shahzad Malik
Abhishek Ranjan
Ravin Balakrishnan
University of Toronto

Artistic Resizing: A Technique
For Rich Scale-Sensitive Vector
Graphics

Pierre Dragicevic
University of Toronto

Stephane Chatty
David Thevenin
IntuiLab

Jean-Luc Vinot
DSNA/DTI R&D

Informal Prototyping of
Continuous Graphical
Interactions by Demonstration

Yang Li
University of Washington

James Landay
University of Washington and
Intel Research Seattle

I3D 2006 Papers

Fast Scene Voxelization
and Applications

Elmar Eisemann
ARTIS-GRAVIR/IMAG-INRIA/ENS

Xavier Décoret
ARTIS-GRAVIR/IMAG-INRIA

Human Motion Estimation
From a Reduced Marker Set

Guodong Liu
Jingdan Zhang
Wei Wang
Leonard McMillan
University of North Carolina
at Chapel Hill

Triangle Order Optimization
for Graphics Hardware
Computation Culling

Diego Nehab
Princeton University

Joshua Barczak
University of Maryland, Baltimore
County

Pedro V. Sander
ATI Research

Sandbox: An ACM Video Game Symposium 2006 Summary

Drew Davidson
Conference Chair

3:45 - 5:30 pm

Room 210

Session Chair

Robert Bridson, The University of British Columbia

Splash Splash

A Procedural Ocean Toolkit

A description of an ocean system
created at Digital Domain for ren-
dering a CG ocean with wakes
from thousands of boats and
waves crashing onto shore.

Marten Larsson
Jens Zalzala
Greg Duda
Digital Domain
mlarsson@d2.com

Character Splash System

This system demonstrates
several processes for automatic
splash generation, localized fluid
simulation, surface generation,
and surface integration.

Scott Cegielski
DreamWorks Animation
scottc@anim.dreamworks.com

So Real It'll Make You Wet

How Industrial Light & Magic cre-
ated multiple shots of photoreal-
istic water for "Poseidon," ranging
from huge long shots to extreme
close ups.

Willi Geiger
Mohen Leo
Nick Rasmussen
Industrial Light & Magic
wgeiger@ilm.com

Ronald Fedkiw
Stanford University and
Industrial Light & Magic

Frank Losasso
Stanford University

Flooding "Ice Age: The Melttdown" Using Wavesynth and Point-Based Froth

This sketch introduces an effects
technique developed at Blue Sky
Studios for creating floodwater
on "Ice Age, The Melttdown."
Wavesynth is a layered spectrum-
based technique using Gerstner
waves.

Simon Brown
Rhett Collier
Blue Sky Studios
simon@blueskystudios.com

Tuesday, 1 August

8:30 – 10:15 am
Hall B2

Session Chair
Steve Derrick, Vicarious Visions

Face to Face

Facial Performance Capture and Expressive Translation for “King Kong”

Successfully conveying and translating the most ferocious to the most subtle and soulful moments from Andy Serkis's performance to the face of King Kong required innovative motion capture processing techniques.

Mark Sagar
Weta Digital
marksagar@hotmail.com

Markerless Facial Motion Capture Using Texture Extraction and Nonlinear Optimization

A markerless facial motion capture algorithm that uses a novel texture-based error metric, eliminating the need for precise camera calibration and providing flexible controls for tuning the optimization.

Eugene Vendrovsky
Ivan Neulander
Rhythm & Hues Studios
ivan@rhythm.com

Playable Universal Capture

A production-level animated facial geometry and texture capture system and how to use the captured assets in real-time interactive applications using a variant of PCA compression.

George Borshukov
Jefferson Montgomery
Witek Werner
Barry Ruff
James Lau
Paul Thuriot
Patrick Mooney
Stefan Van Niekerc
Dave Raposo
Jean-Luc Duprat
John Hable
Hakan Kihlström
Daniel Roizman
Kevin Noone
Jeff O'Connell
Electronic Arts, Inc.
gborshukov@ea.com

Expressive Facial Animation Using Quasi-Eigen Faces

A new method for generating expression bases for blendshape system, which have intuitively recognizable shapes but significantly reduced reconstruction errors compared to hand-generated bases.

Ig-Jae Kim
Seoul National University and Korea
Institute of Science and Technology
drjay@graphics.snu.ac.kr

Hyeong-Seok Ko
Seoul National University

8:30 – 10:15 am
Room 210

Session Chair
Daniel Maskit, Digital Domain

Mocappuccino

World-Space Servoing for Character Animation Under Simulation

A new method for combining physics simulation with motion capture data in real time produces realistic dynamic movement of video game characters.

Pawel Wrotek
Odest Chadwicke Jenkins
Brown University

Morgan McGuire
Williams College
morgan@cs.brown.edu

Quick Transitions Using Multi-Way Blends

A method for responsive, high-quality synthesis of human animation that can generate a transition of user-specified length between any two frames of motion.

Leslie Ikemoto
University of California, Berkeley
leslei@eecs.berkeley.edu

Okan Arikan
University of Texas Austin

David Forsyth
University of California, Berkeley
and University of Illinois at
Urbana-Champaign

Automatic Splicing for Hand and Body Animations

A simple yet effective technique for aligning hand and full body motion that exploits characteristics of human gestures.

Anna Majkowska
University of California, Los Angeles
annam@cs.ucla.edu

Victor Zordan
University of California, Riverside

Petros Faloutsos
University of California, Los Angeles

Anticipating Impacts

An approach for computing and achieving compelling protective poses for a character in anticipation of an impending collision.

Ronald Metoyer
Oregon State University
metoyer@cs.orst.edu

Victor Zordan
University of California, Riverside

Benjamin Hermens
Oregon State University

Chun-Chih Wu
Marc Soriano
University of California, Riverside

Tuesday, 1 August

8:30 – 10:15 am
Room 157

Session Chair
Steven Schkolne, California Institute of the Arts

Touchy Feely

Haptic Radar/Extended Skin Project

Artificial, opto-electronic-based hairs or “cat whiskers” for augmented spatial awareness.

Alvaro Cassinelli
Carson Reynolds
Masatoshi Ishikawa
The University of Tokyo
alvaro@k2.t.u-tokyo.ac.jp

Affective TouchCasting

Touch is a powerful conduit for emotional expression. Affective TouchCasting is a new art form that complements broadcast media with haptic affect in a wearable device.

Leonardo Bonanni
Cati Vaucelle
Massachusetts Institute of Technology
Media Lab
amerigo@media.mit.edu

CREATUREs: Designing Interactive Interior Lamps

Interior lamps designed to generate intimacy for living environments. The lamps can be subjects of affective interactions.

Atsuro Ueki
Kotaro Watanabe
Masa Inakage
Keio University
atsuro@sfc.keio.ac.jp

HiTV: Affective Interaction and Feedback Interface for TV

HiTV provides affective interaction and feedback capabilities for TV experiences. It encourages viewers to react to TV content with affective actions.

Chia-Hsun Jackie Lee
Chaochi Chang
Hyemin Chung
Massachusetts Institute of Technology
Media Lab
jackylee@media.mit.edu

10:30 am – 12:15 pm
Hall B2

Session Chair
Karan Singh, University of Toronto

Crowded, Furry, and in a Hurry

A System For Crowd Rendering

A suite of flexible scripted tools for dealing with the challenge of rendering complex crowd scenes and other common production headaches.

John Haddon
Dave Griffiths
The Moving Picture Company
john-h@moving-picture.com

Grooming, Animating & Rendering Fur for “King Kong”

Weta developed a proprietary fur grooming and management system (Bonobo) that allowed Kong’s fur to be both styled and animated using a form of visual programming.

Martin Preston
Martin Hill
Weta Digital Ltd
martinp@wetafx.co.nz

Ray Tracing Fur for “Ice Age: The Melt Down”

Some of the techniques implemented at Blue Sky Studios to render not only fur but also feathers and grass in “Ice Age: The Melt Down.”

Maurice van Swaaij
Blue Sky Studios
mtravers@blueskystudios.com

One Thousand Lights at 200 mph

Creation of a multi-light-source stadium for the night-race lighting in the movie “Cars.”

Erik Smitt
Pixar Animation Studios
esmitt@pixar.com

Tuesday, 1 August

1:45 – 3:30 pm
Hall B2

Session Chair
Caroline Larboulette, Vienna University of Technology

Bushwhacked

Rendering Grass Terrain in Real-Time With Dynamic Lighting

A new approach to rendering realistic grass fields in real time with dynamic lighting, shadows, antialiasing, animation, and density management.

Kévin Boulanger
University of Central Florida and Institut de recherche en informatique et systèmes aleatoires
kevinb@cs.ucf.edu

Sumanta Pattanaik
University of Central Florida

Kadi Bouatouch
Institut de recherche en informatique et systèmes aleatoires

Simplified Tree Lighting Using Aggregate Normals

Aggregate normals take the shape of a leaf canopy into account during rendering. They help lighters produce a more appealing tree shape even without shadows.

Scott Peterson
PDI/DreamWorks Animation
peterson@pdi.com

Lawrence Lee
DreamWorks Animation

Directing the Plant Interactions for “Over The Hedge”

An animation optimization for object interactions with large amounts of connected shapes, such as trees.

Gokhan Kisacikoglu
DreamWorks Animation
gkisacikoglu@dreamworks.com

A Procedural Modeling Workflow for “Over the Hedge” Foliage

The procedural modeling, animation, and rendering pipeline developed for DreamWorks Animation productions including “Over the Hedge.”

Bruce Tartaglia
Rob Wilson
Olcun Tan
Scott Peterson
Jonathan Gibbs
Dreamworks Animation
btartaglia@dreamworks.com

1:45 – 3:30 pm
Room 210

Session Chair
Karan Singh, University of Toronto

Shaping Up

Variational, Meaningful Shape Decomposition

An algorithm for variational, meaningful shape decomposition based on a novel convexity metric. The algorithm doesn't require model-specific fine-tuning and operates on models with arbitrary genus.

Vladislav Kravevoy
Alla Sheffer
The University of British Columbia
vlady@cs.ubc.ca

Implementation Details of SmoothSketch: 3D Free-Form Shapes From Complex Sketches

Implementation of a system for inferring a 3D shape from complex contour drawings containing tee-junctions and cusps. This sketch discusses the implementation details underlying the SIGGRAPH 2006 Paper: SmoothSketch: 3D Free-Form Shapes From Complex Sketches, page 40.

Olga A. Karpenko
John F. Hughes
Brown University
koa@cs.brown.edu

Extracting Boolean Isosurfaces From Tetrahedral Meshes

The TBIs algorithm computes isosurfaces of volumetric CSG surfaces. Feature lines and corners are identified and extracted as poly-line networks, and preserved during subsequent hierarchical smoothing and simplification.

Gabriel Taubin
Peter G. Sibley
Brown University
taubin@brown.edu

Perception-Based Construction of 3D Models From Line Drawings

A perception-based 3D reconstruction from a single-view image. The method uses a two-pass approach to optimize the hinging-angle between adjacent polygons using several conceptual constraints.

David Feng
Sangwon Lee
Bruce Gooch
Northwestern University
s-lee21@northwestern.edu

Tuesday, 1 August

1:45 – 3:30 pm
Room 253

Session Chair
Marc Alexa, Technische Universität Berlin

Fun With Lasers

Combining Laser Scans

An algorithmic method for improving the resolution of surfaces captured with a laser range scanner. The method is a generalization of the 2D image processing technique known as super-resolution.

Yong Joo Kil
University of California, Davis
yongjk@gmail.com

Boris Mederos
Instituto Nacional de Matematica Pura e Aplicada

Nina Amenta
University of California, Davis

Tomographic Reconstruction of Transparent Objects

A visible-light tomographic reconstruction method for recovering the shape of transparent objects such as glass. The set-up is relatively simple to implement and accounts for refraction.

Borislav Trifonov
Derek Bradley
Wolfgang Heidrich
The University of British Columbia
derek@derekbradley.ca

Feature-Preserving Denoising of Time-Varying Range Data

An innovative technique for accurate denoising of time-varying range data inspired by the idea of similarity-based non-local image filtering and spatio-temporal bilateral filtering for video processing.

Oliver Schall
Alexander Belyaev
Hans-Peter Seidel
MPI Informatik
schall@mpi-inf.mpg.de

Laser Scanning of Three-Dimensional Time-Varying Fluid Phenomena

Results of ground-breaking true three-dimensional time-varying scanning of fluid phenomena. This sketch describes the acquisition hardware, acquisition methodology, geometrical and image corrections needed, and visualization results and analysis.

Daniel Lang
Santiago Lombeyda
Jan Lindheim
Paul Dimotakis
California Institute of Technology
slombey@caltech.edu

3:45 – 5:30 pm
Room 210

Session Chair
Robert Bridson, The University of British Columbia

Wet

Controlling Liquids Using Pressure Jump

A method to control liquids using pressure jump so that they flow into a target shape in a natural way.

Seung-Ho Shin
Jung Lee
Korea University
winstorm@korea.ac.kr

Sun-Jeong Kim
Hallym University

Chang-Hun Kim
Korea University

Texturing Fluids

A novel technique for synthesizing textures over dynamically changing fluid surfaces.

Vivek Kwatra
David Adalsteinsson
University of North Carolina
at Chapel Hill
kwatra@cs.unc.edu

Nipun Kwatra
Georgia Institute of Technology

Mark Carlson
DNA Productions

Ming C. Lin
University of North Carolina
at Chapel Hill

A Texture Synthesis Method for Liquid Animations

A method for synthesizing textures on animated liquid surfaces generated by a physically based fluid simulation system.

Adam W. Bargteil
Funshing Sin
Jonathan Michaels
Tolga G. Goktekin
James F. O'Brien
University of California, Berkeley
adamb@cs.berkeley.edu

Simultaneous Coupling of Fluids and Deformable Bodies

A method for simultaneous two-way coupling of fluid and deformable bodies. By enforcing simultaneous coupling, this method avoids artifacts and allows for large time steps.

Nuttapong Chentanez
Tolga G. Goktekin
Bryan E. Feldman
James F. O'Brien
University of California, Berkeley
bfeldman@cs.berkeley.edu

Tuesday, 1 August

3:45 – 5:30 pm
Room 157

Session Chair
Joe Kniss, University of Utah

Look at the Size of That Thing!

Virtually Infinite Resolution Deformable Surfaces

A novel framework that allows for level-set and fluid simulations at virtually infinite resolutions. The key components are layers combining fast out-of-core data management with efficient compression.

Michael B. Nielsen
University of Aarhus, Denmark

Ola Nilsson
Andreas Söderström
Linköping universitet

Ken Museth
Linköping universitet and University
of Aarhus, Denmark
bang@daimi.au.dk

R-LODs: Fast LOD-Based Ray Tracing of Massive Models

A level-of-detail approach to improve the performance of ray tracing of massive models with little loss of image quality.

Sung-Eui Yoon
Christian Lauterbach
Dinesh Manocha
University of North Carolina
at Chapel Hill
sungeui@cs.unc.edu

Interactive Out-Of-Core Texturing

A parameterization-free texture model with an out-of-core texturing framework that allows interactive texturing of large objects.

Tamy Boubekeur
Christophe Schlick
LaBRI - INRIA - CNRS - Université
Bordeaux
tamy.boubekeur@labri.fr

Mesh Ensemble Motion Graphs

An approach for data-driven animation of mesh animations composed of multiple dynamic groups. Non-interpenetrating motion-graph transitions are computed using a randomized integer programming algorithm.

Doug L. James
Christopher D. Twigg
Andrew Y. Cove
Carnegie Mellon University
djames@cs.cmu.edu

Robert Y. Wang
Massachusetts Institute of Technology

Wednesday, 2 August

8:30 – 10:15 am
Room 210

Session Chair
Kevin Bjorke, NVIDIA Corporation

People, Puppets, & Pillows

Pillow: Interactive Pattern Design for Stuffed Animals

This sketch describes an interactive pattern design system for stuffed animals.

Yuki Mori
The University of Tokyo
yuki@ui.is.s.u-tokyo.ac.jp

Takeo Igarashi
The University of Tokyo/JST PRESTO

Augmented Reality in the Character Animation Pipeline

Tools that use augmented reality and tangible interaction techniques to improve the 3D character animation pipeline by exploiting the physical world as a user interface.

Istvan Barakonyi
Dieter Schmalstieg
Graz University of Technology
bara@ims.tuwien.ac.at

Relighting Human Locomotion With Flowed Reflectance Field

A novel image-based approach for capturing the appearance of a walking or running person so the person can be rendered realistically under variable viewpoint and illumination.

Charles-Félix Chabert
Per Einarsson
Andrew Jones
Bruce Lamond
Wan Chun Ma
Sebastian Sylwan
Tim Hawkins
Paul Debevec
University of Southern California
Centers for Creative Technologies
chabert@ict.usc.edu

Stop Motion Puppets in CG

The challenges and solutions of re-creating stop-motion puppets in CG for DreamWorks Animation and Aardman Animations' animated feature "Flushed Away."

Martin Costello
DreamWorks Animation
martinc@anim.dreamworks.com

Wednesday, 2 August

8:30 – 10:15 am
Room 253

Session Chair
Joe Kniss, University of Utah

Unstructured Progressive Graphics (UPG)

Progressive Volume Rendering of Unstructured Grids on Modern GPUs

An interactive tool for exploration of large tetrahedral meshes through GPU-assisted direct volume rendering.

Steven P. Callahan
Louis Bavoil

SCI Institute - University of Utah
stevec@sci.utah.edu

Valerio Pascucci
Lawrence Livermore National Laboratory

Claudio T. Silva
SCI Institute - University of Utah

Real-Time Multi-Perspective Rendering on Graphics Hardware

A real-time multi-perspective rendering framework suitable for a feed-forward graphics pipeline, with applications for reflection, refraction, caustics, and visualization. The algorithm is implemented via vertex/fragment programs on GPU.

Xianyou Hou
Li-Yi Wei
Heung-Yeung Shum
Baining Guo

Microsoft Research Asia
liyiwei@graphics.stanford.edu

Compressing Dynamically Generated Textures on the GPU

An approach for compressing dynamically generated textures on the fly, using a modern GPU. This method allows for substantially reduced texture bandwidth usage.

Oskar Alexandersson
Christoffer Gurell
Tomas Akenine-Möller

Lunds universitet
oskara@gmail.com

Constructive Solid Trimming

A new representation of Boolean objects that allows semi-transparent rendering, artifact-free rendering, and removing selected exterior surfaces of objects defined by CSG.

John Hable
Georgia Institute of Technology and Electronic Arts Inc.
johnhable@gmail.com

Jarek Rossignac
Georgia Institute of Technology

10:30 am – 12:15 pm
Room 253

Session Chair
Caroline Larboulette, Vienna University of Technology

Camera, Lights, Action!

Stabilized Super-Resolution Zooming

A novel technique for stabilizing video concurrently with super-resolution zooming. In the proposed method, both the stabilization and the super-resolution zooming are performed in a unified framework.

Satoshi Kondo
Tadamasa Toma

Matsushita Electric Industrial Co. Ltd.
kondo.satoshi@jp.panasonic.com

Moviemaps Revisited

Moviemaps are spatialised movies, allowing the viewer to interactively travel through a movie sequence. This sketch presents a different approach and new possibilities for creation of moviemaps.

Dietmar Offenhuber
FH Hagenberg
dietmar.offenhuber@fh-hagenberg.at

Real-Time Triangulation Matting Using Passive Polarization

Replacing the traditional studio bluescreen with a polarized one allows autonomous video matting for special effects without blue spill and scene restrictions.

Morgan McGuire
Williams College
morgan@cs.brown.edu

Wojciech Matusik
Mitsubishi Electric Research Laboratories (MERL)

Real-Time Stereo Vision Using Semi-Global Matching on Programmable Graphics Hardware

Extracting depth information from stereo images in real time allows interactive 3D operations on live video streams. This sketch presents a novel implementation of semi-global matching on graphics-processing hardware.

Ilya D. Rosenberg
Philip L. Davidson
Casey M.R. Muller
New York University
Media Research Lab
siggraph@nullterminated.com

Jefferson Y. Han
New York University
Courant Institute of Mathematical Sciences

Wednesday, 2 August

1:45 – 3:30 pm
Hall C

Session Chair
Apurva Shah, Pixar Animation Studios

Effects Omelette

Directable Simulation of Stylized Water-Splash Effects in 3D Space

This sketch identifies stylized visual qualities found in traditionally animated 2D water-splash effects and establishes a method for capturing their essence, posing them, and animating them in 3D space.

John David Thornton
Blue Sky Studios
jdt@blueskystudios.com

Cartoon Motion Blur for 3D Animation

Using 2D techniques as reference, PDI fx animators came up with three different particle-based methods for creating cartoon motion blur in 3D animated movies.

Andrew Wheeler
Joanne Thiel
Greg Hart
PDI/DreamWorks
awheeler@pdi.com

“King Kong” - The Building of 1933 New York City Computer Animation Festival Sketch

Computer Animation Festival Sketch for Peter Jackson’s “King Kong.” Weta Digital created an historically accurate 3D digital model of the entire island of Manhattan, as well as parts of Brooklyn, Queens, and New Jersey. Excerpts from “King Kong” are featured in the Electronic Theater. For Electronic Theater times, see page 109.

R. Christopher White
Weta Digital Ltd.
rchrisw@mac.com

The Wrecked Road in “Cars”, or How to Damage Perfectly Good Geometry

An innovative approach to modeling, animating, and shading the wrecked road in a key effects sequence in “Cars,” illustrated using several shots from the film.

Ferdi Scheepers
Andy Whittock
Pixar Animation Studios
ferdi@pixar.com

1:45 – 3:30 pm
Room 210

Session Chair
Joe Kniss, University of Utah

Paint & Produce

Interactive Pen-and-Ink Rendering for Implicit Surfaces

Low-resolution triangle meshes are used as an initial approximation to compute smooth silhouettes, suggestive contours, and stippling on implicit surfaces at interactive rates in a sketch-based modeling system.

Ryan Schmidt
Tobias Isenberg
Brian Wyvill
University of Calgary
rms@cpsc.ucalgary.ca

Painterly Rendering With Designed Imperfection Guerilla Studio Sketch

A collection of artists and scientists formed a research team with the goal of simulating a representational painting style that achieves human-like imperfection. For more information about this Guerilla Studio special project, see page 137.

Jin Wan Park
Chung-Ang University
jinpark@cau.ac.kr

Rick Barry
Pratt Institute

Bon Ki Koo
ETRI

Sung Dea Hong
Kyung Hyun Yoon
Chung-Ang University

A Dynamic Drawing Algorithm for Interactive Painterly Rendering

A novel interactive painting algorithm for producing faithful depictions of animated 3D scenes.

David Vanderhaeghe
Pascal Barla
Joëlle Thollot
François X. Sillion
ARTIS GRAVIR/IMAG INRIA
pascal.barla@imag.fr

Non-Realistic Expressive Modeling

An expressive modeling tool that creates 3D collages, inspired by Arcimboldo’s work (1527-1593). The algorithm assembles the collage so that the target shape and the elements are recognizable.

Ran Gal
Olga Sorkine
Tel Aviv University
galran@gmail.com

Tiberiu Popa
Alla Sheffer
The University of British Columbia

Daniel Cohen-Or
Tel Aviv University

Wednesday, 2 August

1:45 – 3:30 pm

Room 253

Session Chair

Daniel Wexler, NVIDIA Corporation

In the Shadows

A Perceptual Heuristic for Shadow Computation in Photo-Realistic Images

A feature-based perceptual heuristic to predict the importance of cast shadows in global illumination renderings, developed using psychophysical experiments.

Peter Vangorp

Olivier Dumont

Toon Lenaerts

Philip Dutré

Katholieke Universiteit Leuven

peter.vangorp@cs.kuleuven.be

Practical Logarithmic Shadow Maps

A new shadow-mapping algorithm and architecture to reduce perspective aliasing. This method saves memory and bandwidth and generates close-to-optimal results for a given resolution. It utilizes non-linear rasterization.

Brandon Lloyd

Naga Govindaraju

Dave Tuft

University of North Carolina

at Chapel Hill

Steve Molnar

NVIDIA Corporation

Dinesh Manocha

University of North Carolina

at Chapel Hill

dm@cs.unc.edu

Precomputed Ambient Occlusion for Character Skins

A method to approximate ambient occlusion on dynamic character skins in real time and with considerable memory savings over uncompressed values.

Adam G. Kirk

University of California, Berkeley

akirk@cs.berkeley.edu

Okan Arikan

University of Texas at Austin

Real-Time Soft Shadows With Cone Culling

A physics-based real-time technique for rendering soft shadows from a single shadow map, enabling shadows with no ombra region, and robust self-shadowing.

Louis Bavoil

Claudio T. Silva

University of Utah

bavoil@sci.utah.edu

3:45 – 5:30 pm

Room 253

Session Chair

Ken Perlin, New York University

Dangerous Displays

3D Volumetric Display Using Passive Optical Scatterers

A new class of volumetric displays trades off the spatial resolution of a digital projector to gain resolution in the third dimension.

Shree K. Nayar

Vijay N. Anand

Columbia University

nayar@cs.columbia.edu

Antialiasing for Automultiscopic 3D Displays

Automultiscopic displays hold great promise for the future of television and digital entertainment. This sketch presents a signal-processing framework to address the major issues in 3D cinematography for automultiscopic displays.

Matthias Zwicker

University of California, San Diego

mzwicker@cs.ucsd.edu

Wojciech Matusik

Mitsubishi Electric Research

Laboratories (MERL)

Frédo Durand

Massachusetts Institute of Technology,

Computer Science and Artificial

Intelligence Laboratory

Hanspeter Pfister

Clifton Forlines

Mitsubishi Electric Research

Laboratories (MERL)

A Framework for Holographic Scene Representation and Image Synthesis

A framework based on a holographic representation including digital recording of a full-parallax hologram, reconstruction, and propagation of the original wavefront for image generation onto a conventional, frame-buffer-based display.

Remo Ziegler

Peter Kaufmann

Markus Gross

Eidgenössische Technische

Hochschule Zürich

remo.ziegler@inf.ethz.ch

Eavesdropping: Water as Physical Display

A system that displays computer-generated images by using only water and light. This allows for a wide variety of applications, especially in the architectural realm.

Sascha Pohflepp

Universität der Künste Berlin

psp@udk-berlin.de

Thursday, 3 August

8:30 - 10:15 am
Room 210

Session Chair
Daniel Maskit, Digital Domain

Rigging the Game

Progressive Skinning for Video Game Character Animations

A level-of-detail character animation system for video games that can be used in conjunction with existing data on current gaming systems.

Simon James Pilgrim
University College London/UK Studio,
Electronic Arts Inc.

Alberto Aguado
Kenny Mitchell
UK Studio, Electronic Arts, Inc.

Anthony Steed
University College London

BlockParty: Modular Rigging Encoded in a Geometric Volume

An innovative approach in which creature rigging and deformations are encoded in a geometric volume. The rigs are broken into logical, interconnected units that are easily interchangeable.

Jeff White
Jason Smith
Industrial Light & Magic
j2white1@yahoo.com

Smart Cars: Driving the Characters in "Cars"

In Pixar's "Cars," even the most basic methods of character movement and gesture needed to be re-thought. This sketch focuses on two technologies created to solve these problems.

Tim Milliron
Fareed Behmaran-Mosavat
Pixar Animation Studios
tm@pixar.com

Davy Jones' Beard: Rigid Tentacle Simulation

The techniques and tools developed for rigid simulation of the CG character Davy Jones from the feature film "Pirates of the Caribbean 2: Dead Man's Chest."

Brice Criswell
Karin Derlich
Don Hatch
Industrial Light & Magic
brice@ilm.com

8:30 - 10:15 am
Room 205

Session Chair
Steve Derrick, Vicarious Visions

Twisted

Resolution-Independent Rendering of Deformable Vector Objects Using Graphics Hardware

A GPU-based technique for resolution-independent rendering of dynamically deformable vector objects using a stencil buffer and transparency multisampling.

Yoshiyuki Kojima
Kaoru Sugita
Toshiba Corp. Research and
Development Center
yoshiyuki.kojima@toshiba.co.jp

Takahiro Saito
Takashi Takemoto
Toshiba Corp. Semiconductor
Company

Fast Simulation of Detailed Layered Deformable Objects In Contact

An efficient algorithm for simulating deformable bodies with high-resolution surface geometry that is able to deal with complex contact scenarios that arise when such objects rub together while they bounce, roll, or slide.

Nico Galoppo
University of North Carolina
at Chapel Hill
nico@cs.unc.edu

Miguel A. Otaduy
Eidgenössische Technische Hochschule
Zürich

Paul Mecklenburg
University of North Carolina
at Chapel Hill

Markus Gross
Eidgenössische Technische Hochschule
Zürich

Ming C. Lin
University of North Carolina
at Chapel Hill

Impulse-Based PD Control for Joints and Muscles

A novel approach to proportional-derivative control of articulated bodies driven by torque and muscle actuators. The approach decouples stiffness from control.

Rachel Weinstein
Eran Guendelman
Stanford University
rlw@cs.stanford.edu

Ronald Fedkiw
Stanford University and Industrial
Light & Magic

Another Fine Mess – How to Generate Disorder: To Order

The real world is an untidy place, so this sketch describes a method for automatically creating equally messy virtual worlds.

Richard Cant
Caroline Langensiepen
Michelle Haskard
Nottingham Trent University
Richard.Cant@ntu.ac.uk

Thursday, 3 August

8:30 - 10:15 am
Room 258

Session Chair
François Guimbretière, University of Maryland, College Park

Off Color

Color-Space CAD

A photoshop plugin that demonstrates a new way of editing images. It enables direct manipulation of the image's color-space using 3D CAD-like operations.

Neophytos Neophytou
Klaus Mueller
Stony Brook University
nneophyt@cs.sunysb.edu

Multispectral Video Fusion

A video fusion technique for enhancing underexposed visual spectrum footage by using simultaneously captured video from non-visible spectrum sensors, such as short wave IR or near IR.

Eric P. Bennett
John L. Mason
Leonard McMillan
University of North Carolina
at Chapel Hill
bennett@cs.unc.edu

Fast and Adaptive Color-to-Grayscale Conversion

In adaptive color-to-grayscale conversion, image colors are analyzed to produce a mapping that preserves salient image features. This work increases the speed and generalizes the functionality of existing methods.

Mark A. Ruzon
Scott Cohen
Gregg Wilensky
Martin Newell
Adobe Systems Incorporated
ruzon@cs.stanford.edu

Fine Feature Preservation in HDR Tone Mapping

An HDR tone-mapping technique that preserves "fine" image features (sharp specular highlights and significant textures) by using techniques originally developed for shot-noise reduction.

Eric P. Bennett
Leonard McMillan
University of North Carolina
at Chapel Hill
bennett@cs.unc.edu

10:30 am – 12:15 pm
Room 210

Session Chair
Mark VandeWettering, Pixar Animation Studios

The Acquisitive Mind

Video Mosaicing for Curved Documents by Structure-From-Motion

A novel video mosaicing method based on structure-from-motion. The method can generate distortion-free images of curved documents from a video captured by a single camera.

Tomokazu Sato
Nara Institute of Science and Technology Japan
tomoka-s@is.naist.jp

Akihiko Iketani
NEC Corporation

Sei Ikeda
Masayuki Kanbara
Nara Institute of Science and Technology

Noboru Nakajima
NEC Corporation

Naokazu Yokoya
Nara Institute of Science and Technology

Efficient Large-Scale Acquisition of Building Interiors

A system for rapid acquisition of building interiors. In 40 hours, a single acquisition device captured six floors and 20 rooms of a large building.

Gleb Bahmutov
Voicu Popescu
Mihai Mudure
Purdue University
bahmutov@yahoo.com

A Scanner for Computing Box Dimensions in Real Time

A new method for computing dimensions of boxes from single-perspective projection images in real time. A scanner prototype was built and used to compute the dimensions of real boxes.

Leandro A. F. Fernandes
Manuel M. Oliveira
Instituto de Informática – Universidade Federal do Rio Grande do Sul
laffernandes@gmail.com

Smooth Video Hopping for Surveillance Cameras

This new visualization application using surveillance cameras enables viewers to switch the cameras without misunderstanding how the camera viewpoint is changed by displaying pseudo-3D transition video between cameras.

Takahiro Tsuda
Itaru Kitahara
Yoshinari Kameda
Yuichi Ohta
University of Tsukuba
tsuda@image.esys.tsukuba.ac.jp

Thursday, 3 August

10:30 am – 12:15 pm
Room 205

Session Chair
Caroline Larboulette, Vienna University of Technology

FX and The City

Hierarchical Simplification of City Models to Maintain Urban Legibility

A novel method for simplifying urban models based on the city-planning concept of urban legibility, using techniques from discrete levels of detail and merging of hierarchical clustering.

Remco Chang
Thomas Butkiewicz
Caroline Ziemkiewicz
Zachary Wartell
University of North Carolina at Charlotte
rchang@uncc.edu

Nancy Pollard
Carnegie Mellon University

William Ribarsky
University of North Carolina at Charlotte

Customizable Panoramic Maps

A technique for making oblique-view maps with computer graphics approaches that enables customization of map contents. The technique revives the lost art of panoramic map making.

Neeharika Adabala
Kentaro Toyama
Microsoft Research India
neeha@microsoft.com

Interactive Video Exploration Using Pose Slices

An interactive video browser that addresses two inherent bottlenecks in video browsing (user time and screen space) by rendering instantaneous objects' appearances, denoted as pose slices.

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anataxel@post.tau.ac.il

Yaron Caspi
Weizmann Institute of Science

Alon Gamliel
Tel Aviv University

Yasuyuki Matsushita
Microsoft Research Asia

Implementing Real-Time Video Abstraction Implementation Sketch

This sketch complements the SIGGRAPH 2006 paper: Real-Time Video Abstraction, page 50. It is an in-depth discussion of implementation details and design considerations that are only briefly treated in the paper.

Sven C. Olsen
Holger Winnemöller
Bruce Gooch
Northwestern University
sven@cs.northwestern.edu

10:30 am – 12:15 pm
Room 258

Session Chair
Apurva Shah, Pixar Animation Studios

New Tricks for Old Dogs

Normal Transformations for Articulated Models

An exact method for normal transformation on SSD models, and an examination of the errors introduced by approximations.

Bruce Merry
Patrick Marais
James Gain
University of Cape Town
bmerry@cs.uct.ac.za

Random Numbers for Computer Graphics

A new hashing function, called Goulburn, which is better-suited for computer graphics applications than the popular existing solutions.

Mayur Patel
Digital Domain
drone115b@yahoo.com

Simultaneous Matting and Compositing

By integrating matting and compositing into a single optimization process, this system can compose foreground elements onto a new background more efficiently than previous approaches.

Joe Wang
University of Washington
juew@ee.washington.edu

Michael F. Cohen
Microsoft Research

An Improved Representation for Stroke-Based Fonts

For a typical Asian typeface, traditional outline-based fonts require ~5-10 MBs. Existing stroke-based fonts lack expressiveness. Rich Stroke Fonts provide detailed and expressive fonts with a small memory footprint.

Elena J. Jakubiak
Tufts University
jakubiak@cs.tufts.edu

Ronald N. Perry
Mitsubishi Electric Research Laboratories (MERL)

Sarah F. Frisken
Tufts University

Thursday, 3 August

10:30 am – 12:15 pm
Room 253

Session Chair
Ken Perlin, New York University

Talk to My Agent

POCOMZ: An Ambient Media Device with IM Application “wija”

An ambient media device that works with instant-messenger applications to provide a new way of internet-based communication. Real-space ambience is produced through virtual connection with other people.

Kyoichi Sakamoto
Kenji Saito
Aya Shigefuji
Anna Takahashi
Masa Inakage
Keio University
ks91@sfc.wide.ad.jp

Metazoa Ludens

A revolutionarily system that allows pets to play computer games with humans. These games will provide beneficial new relations and support progressive evolution of the Metazoa species.

Roger Thomas K.C. Tan
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Vladimir Todorovic
RASTER

James K.S. Teh
Nanyang Technological University

Goran Andrejin
RASTER

Lee Shang Ping
Adrian David Cheok
Nanyang Technological University

Robo Topobo: Improvisational Performance With Robotic Toys

A controller that allows users to save, replay, and modulate playback of up to four kinetic recordings created with Topobo, a constructive assembly system with kinetic memory.

Hayes Raffle
Massachusetts Institute of Technology
Media Lab
hayes@media.mit.edu

Laura Yip
Massachusetts Institute of Technology

Hiroshi Ishii
Massachusetts Institute of Technology
Media Lab

MARA: An Augmented Personal Assistant and Companion

A personal assistant that uses augmented reality to realize a new type of user interface based on a virtual human companion.

Andreas Schmeil
Wolfgang Broll
Fraunhofer FIT
andreas.schmeil@informatik.uni-ulm.de

1:45 – 3:30 pm
Room 205

Session Chair
Wendy Ju, Stanford University

A Brave New World

Theater of Embedded Intelligence

Design and implementation of a computer-generated, computer-controlled theatrical setting for performance of a children's play: Go Dog Go.

Eric Sauda
Chris Beorkrem
University of North Carolina at Charlotte
ejsauda@email.uncc.edu

MASTABA: The Household Shrine in The Future Archived Digital Pictures

The household shrine of the future, in which families hand down their memories through digital photos.

Daisuke Uriu
Takahiro Ogasawara
Naohito Shimizu
Naohito Okude
Keio Media Design
uriu@sfc.keio.ac.jp

A Nested Marker for Augmented Reality

A recursive layered structure that enables close-up views of augmented-reality scenes and enlarges the range of the moving area.

Keisuke Tateno
Itaru Kitahara
Yuichi Ohta
University of Tsukuba
tateno@image.esys.tsukuba.ac.jp

traces::

An ambient installation based on visual hull reconstruction from multiple cameras on the GPU to find body intersections with floors and walls so users can detect their absence.

Kevin Quennesson
Ali Mazalek
Georgia Institute of Technology,
GVU Center
kevin.quennesson@polytechnique.org

Thursday, 3 August

1:45 – 3:30 pm

Room 258

Session Chair

Kevin Bjorke, NVIDIA Corporation

Fast & Cheap

Fast Approximation to Spherical Harmonics Rotation

A fast and simple approximation of spherical harmonic rotation. The approximation decreases the asymptotic complexity of the rotation. The speed-up in practical applications is 4 to 6.

Jaroslav Krivanek

Czech Technical University
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Jaakko Konttinen
Sumanta Pattanaik

University of Central Florida

Kadi Bouatouch

IRISA/INRIA Rennes

Jiri Zara

Czech Technical University

Real-Time All-Frequency Relighting in Local Frame

A method for real-time rendering of scenes with realistic shadow effects, complex BRDFs, bump mapping, and spatially varying BRDFs under varying complex illumination and changing view on graphics hardware.

Wan-Chun Ma
Chun-Tse Hsiao
Ken-Yi Lee

Yung-Yu Chuang
National Taiwan University
alexma98@gmail.com

Real-Time Rendering of Realistic Rain

A new GPU-based technique to render realistic rain. It includes off-line extraction of rain mattes from videos and a particle system that uses PRT to incorporate the scene radiance.

Lifeng Wang
Zhouchen Lin

Microsoft Research Asia

Tian Fang

South China University of Technology

Xu Yang

Nankai University

Xuan Yu

Shanghai Jiao Tong University

Sing Bing Kang

Microsoft Research
sbkang@microsoft.com

Sequential Sampling for Dynamic Environment Maps

A sequential mechanism for sampling from the product distribution of the illumination and the BRDF in the presence of dynamic environments and specular BRDFs.

Abhijeet Ghosh

Arnaud Doucet

Wolfgang Heidrich

The University of British Columbia
ghosh@cs.ubc.ca

1:45 – 3:30 pm

Room 253

Session Chair

François Guimbretière, University of Maryland, College Park

Worth a Thousand Words

TagOrbitals: A Tag Index Visualization

TagOrbitals are a new way of visualizing tag indexes. They display an entire index at once, each tag's relationship to other tags, and other details of the tagged items.

Bernard Kerr

IBM Research
bernard_kerr@yahoo.com

The Bridge Project: A Visualization Exercise on Free Association & Internet Query and Search Mechanisms

A 3D environment that contains a structure composed of modules containing visual content based upon free associations harvested from search engines.

Elif Ayiter

Sabanci Universitesi
ayiter@sabanciuniv.edu

Visualizing Uncertainty in Archaeological Reconstructions: A Possibilistic Approach

A new approach to visualizing uncertainty in heritage reconstructions. The archaeologist's knowledge about reconstructed areas is derived by using possibility theory and is visualized with pseudocolour sequences.

Maria Sifniotis

Ben Jackson

Martin White

Katerina Mania

Phil Watten

University of Sussex
m.sifniotis@sussex.ac.uk

A Synthetic Moviemaker for Spatial Representation

A new type of digital animation tool for architects that automatically constructs a stylized cinematic representation of a given geometric model of a building.

Takehiko Nagakura

Panagiotis Chatzitsakyris

Massachusetts Institute of Technology
takehiko@mit.edu

inter

Thursday, 3 August

1:45 – 3:30 pm
Room 210

Session Chair
Diego Gutiérrez, Universidad de Zaragoza

Skin Deep

A Completely Procedural Approach to Materials

Through a unique set of procedural texturing tools for Blue Sky's proprietary renderer CGIStudio, painted maps have been virtually eliminated from the materials process.

Michael Eringis
Blue Sky Studios
powerhouse@nyc.rr.com

A Spectral Shading Model for Human Skin

A practical, spectral shading model for human skin. The model simulates the full range of skin appearance using only four intuitive parameters.

Craig Donner
Henrik Wann Jensen
University of California, San Diego
cdonner@graphics.ucsd.edu

Scattered Spherical Harmonics Approximation for Accelerated Volume Rendering

A method for approximating spherical harmonics by using least-squares fitting, which leads to fast precomputation and efficient storage requirements.

Nafees Bin Zafar
Digital Domain
nafees@d2.com

Johan Akesson
Linköpings universitet

Doug Roble
Digital Domain

Ken Museth
Linköpings universitet

Single-Pass Wireframe Rendering

A novel and fast single-pass technique for wireframe rendering with hidden surface removal.

J. Andreas Bærentzen
Danmarks Tekniske Universitet
jab@imm.dtu.dk

Steen Lund Nielsen
Flux Studios and Danmarks Tekniske Universitet

Mikkel Gjørl
Dalux

Bent D. Larsen
Danmarks Tekniske Universitet and Dalux

Niels Jørgen Christensen
Danmarks Tekniske Universitet

3:45 – 5:30 pm
Hall B2

Session Chair
Kevin Bjorke, NVIDIA Corporation

About Face

Dichromatic Separation: Specularity Removal and Editing

An algorithm for separating the specular and diffuse components of images and videos. The reflection components can be processed independently to produce a variety of visual effects.

Satya P. Mallick
University of California, San Diego
spmallick@graphics.ucsd.edu

Todd Zickler
Harvard University

Peter Belhumeur
Columbia University

David Kriegman
University of California, San Diego

Video Patch Replacement

A system for replacing user-specified portions of an input video sequence with custom content. The method relies on a kernel-based motion estimation procedure to establish frame-to-frame correspondence.

Igor Guskov
University of Michigan
guskov@engin.umich.edu

Processing and Editing of Faces Using a Measurement-Based Skin Reflectance Model Implementation Sketch

An almost fully automated processing pipeline, including a custom-built acquisition system, calibration procedures, and rendering for human faces. The underlying model is intuitive, physically plausible, and allows easy face editing. This sketch provides implementation details on the SIGGRAPH 2006 paper: Analysis of Human Faces Using a Measurement-Based Skin Reflectance Model, page 47.

Bernd Bickel, Tim Weyrich
Markus Gross
Eidgenössische Technische Hochschule Zürich
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Wojciech Matusik
Hanspeter Pfister, Chien Tu
Janet McAndless, Jinho Lee
Mitsubishi Electric Research Laboratories (MERL)

Craig Donner
Henrik Wann Jensen
University of California, San Diego

Addy Ngan
Massachusetts Institute of Technology

Digital Face Beautification

An exciting new tool for image retouching that can significantly enhance the attractiveness of a face in a portrait image.

Tommer Leyvand
Daniel Cohen-Or
Tel-Aviv University
tommer@tau.ac.il

Gideon Dror
Academic College of Tel-Aviv-Yaffo

Dani Lischinski
The Hebrew University of Jerusalem

sect

Thursday, 3 August

3:45 – 5:30 pm

Room 210

Session Chair

Diego Gutiérrez, Universidad de Zaragoza

Let There Be Light

Inside Just-in-Time Radiance Transfer

Implementation Sketch

This is the implementation sketch of the SIGGRAPH 2006 paper: Generalized Wavelet Product Integral for Rendering Dynamic Glossy Objects, page 46. It illustrates the implementation details.

Weifeng Sun

Amar Mukherjee

University of Central Florida
wsun@cs.ucf.edu

Temporal Radiance Caching

A method for fast, high-quality global illumination in dynamic scenes containing non-diffuse objects. This method leverages temporal coherence and the power of GPUs for fast, global illumination computation.

Pascal Gautron

IRISA/INRIA Rennes and University of Central Florida
pgautron@irisa.fr

Kadi Bouatouch

IRISA/INRIA Rennes

Sumanta Pattanaik

University of Central Florida

Subsurface Texture Mapping

A new method for real-time modeling and rendering of complex organic materials made up of multiple layers of variable thickness.

Guillaume François

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Rennes
gfrancoi@irisa.fr

Sumanta Pattanaik

University of Central Florida

Kadi Bouatouch

IRISA/INRIA Rennes

Gaspard Breton

France Telecom R&D Rennes

Precomputed Radiance Transfer for Dynamic Scenes With Diffuse Interreflection

A new precomputed radiance transfer method for rendering dynamic scenes taking into account diffuse interreflection. With this method, dynamic scenes with diffuse interreflection can be rendered interactively on GPU.

Kei Iwasaki

Wakayama University
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Yoshinori Dobashi

Hokkaido University

Naoki Tamura

Henry Johan

The University of Tokyo

Fujiichi Yoshimoto

Wakayama University

Tomoyuki Nishita

The University of Tokyo

3:45 – 5:30 pm

Room 205

Session Chair

Wendy Ju, Stanford University

Sound & Fury

Musical Connections and Heterophonic Maps

Computer Animation Festival Sketch

Maps are metaphors. Time-slices are digital maps that connect image and audio. An animation time slice is mapped into music. Image and audio combine and cohere as a single artwork. This sketch presents production details of a work in the Animation Theater: calidri. See page 106 for the Animation Theater schedule.

Brian Evans

University of Alabama
brian.evans@ua.edu

Sparse Lumigraph Relighting by Illumination and Reflectance Estimation From Multi-View Images

A novel image-based modeling algorithm to estimate illumination and albedo using images captured under unknown illumination settings.

Tianli Yu

Hongcheng Wang

Narendra Ahuja

University of Illinois at Urbana-Champaign

Wei-Chao Chen

NVIDIA Corporation
ciao@cs.unc.edu

Fast Proximity Computation Among Deformable Models Using Discrete Voronoi Diagrams

Implementation Sketch

Implementation details related to the SIGGRAPH 2006 paper: Fast Proximity Computation Among Deformable Models Using Discrete Voronoi Diagrams, page 49.

Avneesh Sud

Naga Govindaraju

Russell Gayle

Ilknur Kabul

Dinesh Manocha

University of North Carolina at Chapel Hill
sud@cs.unc.edu

TAPESTREA: Sound Scene Modeling by Example

A new paradigm and unified analysis-transformation-synthesis framework for flexibly creating high-quality “sound scenes” from a set of existing recordings, for use in entertainment, virtual/augmented reality, and art projects.

Ananya Misra

Perry R. Cook

Ge Wang

Princeton University
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Thursday, 3 August

3:45 – 5:30 pm
Room 253

Session Chair
Daniel Wexler, NVIDIA Corporation

Cache Flow

A Scalable and Reconfigurable Shared-Memory Graphics Architecture

A scalable tightly coupled cluster of custom-built boards that provide an AGP interface for commodity graphics accelerators.

Michael Manzke
Ross Brennan
Keith O'Connor
John Dingliana
Carol O'Sullivan
Trinity College Dublin
michael.manzke@cs.tcd.ie

Silhouette Management for Protruded Displacement Mapping

A new silhouette management technique using tangent space transformation represents the correct silhouette of protruded shapes by solving the overflow problem that frequently occurs in image-based displacement mapping.

Byoungyun Yoo
Soonhung Han
Korea Advanced Institute of Science and Technology
yoo@kaist.ac.kr

A Performance-Oriented Data-Parallel Virtual Machine for GPUs

A new virtual machine abstraction for GPUs that provides policy-free, low-level access to the hardware and is designed for high-performance, data-parallel applications.

Mark Peercy
Mark Segal
Derek Gerstmann
ATI Research Inc.
dgerstma@ati.com

The Real-Time Reprojection Cache

A method that uses graphics hardware to cache and track surface information from previously rendered frames. This information is then used to significantly improve rendering cost and/or quality.

Diego Nehab
Princeton University

Pedro V. Sander
John Isidoro
ATI Research
pedro@pedrosander.com

3:45 – 5:30 pm
Room 258

Session Chair
Mark VandeWettering, Pixar Animation Studios

Geometry to Go

GPU-Accelerated Transparent Point-Based Rendering

The first solution to full-featured rendering, including multi-layer transparency shading effects, of point-based surfaces.

Yanci Zhang
Renato Pajarola
Universität Zürich
pajarola@acm.org

The Quantized Kd-Tree: Compression of Huge Point Sampled Models

The Quantized Kd-Tree is a point-cloud compression scheme suited for ray tracing purposes.

Erik Hubo
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Universiteit Hasselt
erik.hubo@uhasselt.be

Tom Mertens
Massachusetts Institute of Technology

Philippe Bekaert
Expertise Centre for Digital Media,
Universiteit Hasselt

A Novel and Efficient Progressive Lossless Mesh Coder

A progressive lossless mesh coder that compresses arbitrary triangular meshes with superior rate-distortion performance. It has a great potential for 3D data streaming in mobile environments.

Jingliang Peng
Ilya Eckstein
C.C. Jay Kuo
University of Southern California
jingliap@usc.edu

Streaming Terrain Rendering

A client-server system for serving and streaming large terrains to heterogenous clients.

Soumyajit Deb
Microsoft Research
sdeb@microsoft.com

P.J. Narayanan
Shiben Bhattacharjee
International Institute of Information Technology

Research Posters

interpersonal encounters with incremental, preliminary, partial, and innovative insights that are important but don't comprise a full paper by themselves. Posters are displayed throughout the conference week. In scheduled sessions, poster presenters discuss their work and answer questions.

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Research Posters Committee

Michael McGrath
Research Posters Chair
Colorado School of Mines

Juan Buhler
Pixar Animation Studios

Adam Finkelstein
SIGGRAPH 2007 Sketches & Posters Co-Chair
Princeton University

Barbara Cutler
SIGGRAPH 2006 Student
Research Competition Chair
Rensselaer Polytechnic Institute

Research Poster Viewing

Main Lobby

Sunday, 30 July	8:30 am - 5:30 pm
Monday, 31 July	8:30 am - 5:30 pm
Tuesday, 1 August	8:30 am - 5:30 pm
Wednesday, 2 August	8:30 am - 5:30 pm
Thursday, 3 August	8:30 am - noon

Research Poster Sessions

Poster authors will stand by their posters to talk with attendees and demonstrate their work during these times:

Tuesday, 1 August	10:30 am - 12:15 pm
Wednesday, 2 August	10:30 am - 12:15 pm

Animation

1

Modeling Behavior in a School of Fish by Fast Synthetic Distributed Vision

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Bending Burning Matches and Crumpling Burning Paper

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Simulation and Rendering for Bubbles in Liquid

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Animating Viscous Fluids in the Multiphase Field

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Procedural Modeling of Urban Land Use

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Craig Brozefski

Uri Wilenski

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Michael I. Norton

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Dan Ariely

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Lover's Cups: Connecting You and Your Loved One

Chia-Hsun Jackie Lee

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Rana el Kaliouby

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User Interface Design

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RGBy Desk

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Shinya Matsuyama

Makoto Hirahara

Prototype

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Broadband News Aggregator

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Illumination Brush: Interactive Design of Image-Based Lighting

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Microsoft Research Asia

Takeo Igarashi

The University of Tokyo

Heung-Yeung Shum

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Device Art: A New Approach in Media Art

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Ryota Kuwakubo

Kazuhiko Hachiya

Nobumichi Tosa

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Taro Maeda

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Hiroaki Yano

Hiroo Iwata

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Delayed Feedback in a Chinese Brush Painting Interface

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Interactive Autostereoscopic Display With 60 Ray Directions

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Kei Utsugi

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Achal Oza

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Irene Cheng

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Generalized Building Polygon Partitioning for Automatic

Generation of 3D Building Models

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Itaru Kitahara

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Kiyoshiko Kogure

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Tomoya Ishikawa

Kazumasa Yamazawa

Naokazu Yokoya

Nara Institute of Science and Technology

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Mixed Reality Environment
With a Mirror
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Takeshi Naemura
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Josephine Anstey
Sarah Bay-Cheng
Stuart C. Shapiro
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UbiHand: A Wearable Input
Device for 3D Interaction
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Virtual Art Volant
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INT-MANUS: Revolutionary Control
of Production Processes
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Patronik

F. Meo

FIDIA S.p.A.

D. Salle

Robosoft

A. Hermann Praturion

CRF

F. Hasenbrink

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An Ontological Bridge Between In-
formation and Scientific Visualization
Thomas Lechner
David Feng
Pin Ren
Bruce Gooch
David Channin
Northwestern University

William Van Bonn

John G. Shedd Aquarium

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izing High-Dimensional Datasets
Pin Ren
Bruce Gooch
Northwestern University

Benjamin Watson

North Carolina State University

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Information Visualization Techniques
Jonathan Pfautz
Charles River Analytics

Amy Bisantz

University at Buffalo

Emily Roth

Roth Cognitive Engineering

Adam Fouse

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for Surface Extraction From Various
Kinds of Volumetric Structure
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Bing-Yu Chen
Ming Ouhyoung
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Douglas McCune
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Horst K. Hahn
Jan Rexilius
Heinz-Otto Peitgen
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Projecting Surface Curvature Maps
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Interactive 3D Graphics for Web-
Based Data Analysis and Visualiza-
tion for the Digital Fish Library
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A User Interface for High-Dynamic-
Range Transfer Function Design
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Paul Doherty
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Aimee Weber

Applied Perception in Graphics and Visualization (APGV)

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Distance Perception in
Projection Environments

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Greg Schmidt

Mark A. Livingston

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Gayathri Narasimham

Bjoern Rump

Timothy P. McNamara

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Diane Gromala

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Jodie Plumert

James Cremer

Joseph Kearney

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William Cowan

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of View, and Requested Vehicle
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Najla Ahmad

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Revealed Novel Qualitative Errors in
Visual Path Integration

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Object-Presence Framework:
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on Depth Ordering

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Cindy Grimm

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The Relationship Among Age
and Other Factors on Incidence of
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Laura L. Arns

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A Quantitative Assessment of the
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Educators Program

intersect with research, methods, and techniques in every aspect of education at every level. Educators and learners present research, summarize projects, and debate approaches in papers, panels, forums, and QuickTakes.

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Educators Program Chair
Middle Tennessee State University

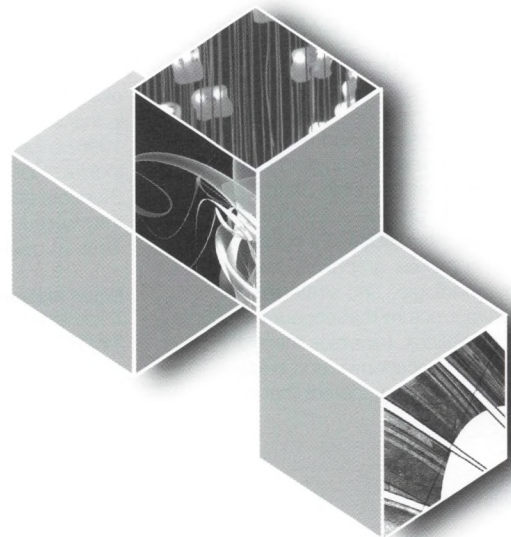
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Valerie Miller
Georgia State University

Janese Swanson
SIGGRAPH 2007 Educators Program Chair
The Art Apprentice

Guanping Zheng
Middle Tennessee State University

Mary Nesnay
XSV: Ex-Student Volunteer



Wednesday, 2 August

8 – 8:15 am

Ramp In Room 156

8:30 – 9 am Paper

Using Graphics Research to Teach Freshman Computer Science Room 157

Although research is often a daunting task for undergraduates, early exposure to research topics and papers can be an effective means of stimulating interest and teaching students about real-world solutions to non-trivial problems. To that end, this new educational project teaches general concepts in computer science by infusing large-scale problems in computer graphics into the undergraduate curriculum. This paper presents an approach to teaching a first course in computer science using a recently published graphics research problem. The results from the first semester are promising. Students, energized by the subject matter and visual output, produced excellent work and evaluated the class highly.

Timothy Davis
Sarah Matzko
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8:30 – 9:30 am Panel

Designing Collaborative Interdisciplinary CG Experiences in the Curriculum Room 156

This panel presents content and results from courses at the Advanced Computing Center for the Arts and Design at The Ohio State University that are designed to provide students with research-oriented interdisciplinary collaborative experiences in computer graphics. The panel describes methodologies and strategies for fostering an infrastructure that engages students from varying disciplines, traverses the silo structure inherent in academia, and creates experimental and evolving content that is exciting to teach.

Maria Palazzi
Matthew Lewis
Rick Parent
Mary Tarantino
Norah Zuniga-Shaw
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9 – 9:30 am Paper

Increasing Student Retention in Computer Science Through Research Programs for Undergraduates Room 157

For two years, the University of Rhode Island and IMEDIA in Providence, Rhode Island, have brought together local undergraduates from art, design, and computer science majors to engage in a structured program of 3D graphics and new media research. The primary goals are to increase the number of students who continue to graduate studies in computing and to scientific careers. Even for those students who do not continue to graduate school, the program strengthens the overall retention rates in computing and trains a stronger industrial workforce. This presentation describes the structure and goals of the program, its problems, the curriculum, example student research projects, initial results from surveys, and retention.

Peter Stephenson
L Miguel Encarnação
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Jean-Yves Hervé
Ron Hutt
Joan Peckham
University of Rhode Island

9:30 – 10 am Paper

Computer-Aided Sculpting Room 156

An experimental interdisciplinary course that focuses on both artistic and scientific aspects of shape modeling. Problems considered in this course, which has been taught since 1996, influenced the development of a topological mesh modeling system called TopMod. Students added new features to TopMod while they were taking the course. It has generated at least 10 published papers and sketches.

Ergun Akleman
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9:30 – 10:30 am Panel

Games and Interactivity in Computer Science Education Room 157

Interactive computer graphics and games are powerful tools that can be used in the educational process. In fact, both interactive and game tools are growing in importance in computer science learning, since they are useful in many of the typical topics included in the curriculum: linear algebra, artificial intelligence, computer graphics, networks, real time simulations, human computer interaction, and software engineering, among others. The main goal of this panel is to discuss and present solutions and educational tools that are being used or developed by professors, researchers, and companies, based on game and/or interactive technologies. The presenters show examples from their own experience and survey programs and tools used at various institutions around the world.

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Tiffany Barnes
University of North Carolina

Maria das Graças Chagas
Bruno Feijó
Pontifícia Universidade Católica do Rio de Janeiro

Ken Perlin
New York University

Jason Della Rocca
IGDA

Jon Schwartz
Morrison Schwartz Inc.

Romero Tori
Universidade de São Paulo

Wednesday, 2 August

10 - 10:30 am QuickTake

ARTNATOMY Room 156

ARTNATOMY is an interactive and free online tool for teaching and learning the anatomical and biomechanical foundation of facial expression morphology. It takes advantage of digital animation, interactivity, and multimedia to facilitate visual understanding and learning. The primary goal is to give students a convenient reference tool that facilitates experimentation with the underlying anatomical structures. This compact tool eliminates the need for cumbersome teaching aids such as slides and photocopies, and it provides a complete supporting document solution for institutions that are not equipped with such resources.

Victoria Contreras Flores
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10 - 10:30 am QuickTake

Thermoesthesia: On Artist-Scientist Collaboration Room 156

Thermoesthesia is a new style of interactive artwork with an original thermal-sense display that allows users to feel the temperature of visually displayed objects by directly touching the objects. It is expected to extend access to interactive information in daily life. This paper describes the collaborative art-science process used to develop Thermoesthesia.

Kumiko Kushiya
Kinya Fujita
Momoko Inose
Toshiie Kitazawa
Rie Yokomatsu
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Shinji Sasad
Mototsugu Tamura
Nippon Electronics College

10:30 - 11 am Paper

Teaching Introductory Computer Graphics Using Java 3D, Games, and Customized Software: A Brazilian Experience Room 157

An innovative introductory computer graphics course supported by interactive graphical software tools. This paper presents Interlab 3D, an interactive tool for learning scene graphs and Java 3D, and the enJine, a didactic game engine in Java, both of them built by the authors with this course in mind. Development of a computer game as a term project for this course allows its integration with other components in a computer science curriculum, as well as with some art and design courses.

Romero Tori
Joao Luiz Bernardes, Jr.
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Ricardo Nakamura
Escola Politécnica da Universidade de São Paulo

10:30 - 11:30 am Panel

Student Opportunities: Industry Scholarship, Internship, and Apprenticeship Room 156

Various perspectives on student opportunities in the computer graphics industry. Topics include: program design and implementation in visual effects for feature films and the gaming community, what it's like to be an intern, university networking, and industry program participation. The panel explores what is working for schools and universities, students, and the computer graphics industry.

Kathleen O'Reilly
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Amos Marvel
Insomniac Games

Barbara McCullough
Rhythm & Hues Studios

Phyllis Schaen
Ringling School of Art & Design

Yancy Young
Insomniac Games

11 am - noon Panel

Multidisciplinary Collaborative Learning Via 3D Game Development Room 157

The tremendous growth of the 3D, first-person video game genre provided a vehicle for creation of a one-year, upper-level undergraduate experience in multidisciplinary, highly collaborative software design and implementation. This panel reports on a team-taught course that encompassed concepts from computer science, digital media, film, theater, and music. The learning environment balanced individual experiential skills development with reflective analysis of media implementation as students built a media-rich interactive game. Panelists provide four perspectives on the design and execution of the course and resulting game: computer science, digital art, audio technology, and writing.

Ursula Wolz
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Chris Ault
Teresa Nakra
Kim Pearson
Phil Sanders
The College of New Jersey

11:30 am - noon Paper

Play to Learn: Exploring Educational Games in Museums Room 156

A quick overview of various museum online educational games that use scenarios, role-play, simulation, creative play, puzzles, mysteries, and Bones: An Exhibit Inside You and OLogy as main examples for discussion. This paper explores how to embed learning outcomes in designing online educational games, especially in the museum context, and it addresses the challenges of creating such games from several points of view, including: graphic design, narration, scripting, character development, and designing the learning sequences. By examining various productions, the paper hopes to achieve a better solution for small and budget-conscious museums. It also summarizes the implications for future museum online gaming development by examining the most recent MUSE Awards winners from the American Association of Museums (AAM), which recognize outstanding achievement in museum media.

Herminia Wei-Hsin Din
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Wednesday, 2 August

1 - 2 pm

Panel

Art School or Trade School? Room 156

Undergraduate, graduate, and certificate programs in visual effects and animation are taught in art schools, traditional universities, and specialized schools, all of which must wrestle with their goals for students. Are we following the model of trade schools and teaching specific technical skills that students need for entry-level digital production jobs at large studios, or are we training digital artists and filmmakers who will be creating their own works of art using new tools and technologies? Leaders in animation and visual effects education discuss this dichotomy and the relative benefits of each approach for job-seeking students.

Tad Leckman

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Alex Alvarez

Gnomon School of Visual Effects

Larry Bafia

Vancouver Film School

Peter Bardazzi

New York University

Barbara Boyle

University of California, Los Angeles

William J. Mitchell

Massachusetts Institute of Technology, Media Lab

Jeff Scheetz

The Digital Animation & Visual Effects School

Kathy Smith

University of Southern California

1 - 2 pm

Panel

Creativity, Law and Ethics: What Are the Boundaries? Room 157

While the digital revolution has changed the way we work, it has also opened up a plethora of legal and ethical issues. From the initial conception through final production, issues of copyright, deception, and privacy, to name only a few, continue to befuddle creators, ethicists, and lawyers.

When does sampling become copyright violation? At what point does editing become deception? How real is unreal? Who are artists ultimately answerable to: Employers? Audiences? Themselves? This panel examines some of these and other legal, philosophical, and ethical issues facing computer artists as they create and distribute their work. And it might offer some suggestions that might keep you out of jail.

Larry L. Burriss

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Henry Holtzman

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2 - 2:30 pm

Paper

Designing Adaptive Multimedia Interactives to Support Shared Learning Experiences Room 156

The goal is designing this multimedia interactive exhibit for an aquarium gallery was to use adaptive technologies to better immerse and engage visitors in complicated educational concepts about the life of wild belugas. The beluga simulation interactive uses extremely realistic 3D graphics and is based on an intelligent system that allows the virtual belugas, in a natural pod context, to learn and alter their behavior based on contextual visitor interaction.

The beluga interactive design was informed by: research data from the aquarium's live belugas (for example, voice recordings tied to mother/calf behavior), multimedia resource materials, interviews with the marine mammal scientists and education staff, and its proximity to and integration with the aquarium's live beluga exhibit.

Steve DiPaola

Caitlin Akai
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2 - 2:30 pm

Paper

Using Augmented-Reality Games to Teach 21st Century Skills Room 157

Reliving the Revolution is a novel model for considering how augmented-reality (AR) games can support necessary 21st century skills such as interpretation, problem-solving, collaboration, identifying biases, and using multiple sources. It takes place in Lexington, Massachusetts, the site of the Battle of Lexington. Participants interact with virtual historic figures and items, which are triggered by GPS to appear on PDAs, depending on where they are standing in Lexington. Game participants receive different evidence depending on their role in the game (Minuteman soldier, Loyalist, African American soldier, or British soldier), and use this information to decide who fired the first shot in the battle. This presentation explores how AR game elements, when properly designed, can motivate the authentic practice of 21st century skills.

Karen Schrier

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2:30 - 3 pm

Paper

Proposal for a Learning Program With Observation Supported by Simulation Room 156

Aquariums have developed two types of educational programs. One aims to encourage learning by observation. The other type uses interactive media to deliver learning. This paper proposes that simulation can be a valuable technique for supporting observational learning.

Rina Takahashi

Kaori Aoki

Naoki Wakabayashi

Taichi Watanabe

Tokyo University of Technology
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Wednesday, 2 August

2:30 - 3 pm Paper

Ninja Looting for Instructional Design: The Design Challenges of Creating a Game-Based Learning Environment Room 157

This paper presents a case study of a 3D game-based learning environment and highlights some of the issues that arose during design, development, and production. Topics include the types of design elements that can be appropriated (looted) from the field of game design, the underlying instructional design and aspects of cognitive research that support the design of gamebased learning environments, the technical and production challenges of creating a 3D game-based learning environment with limited resources, and various low-cost and free resources for creating game-based learning environments (without resorting to ninja looting).

Michele D. Dickey
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3 - 3:30 pm Panel

Sharing Oceanographic Exploration Through Telepresence Room 156

The Institute for Exploration has pioneered the use of telepresence technology to involve remote scientific experts, students, teachers and the general public in exploration of remote sites, particularly in the deep ocean. Nichols and Newman describe the technologies used and results from a recent expedition to the Black Sea and Aegean Sea looking for ancient shipwrecks and active volcanoes.

Jim Newman
Chief Engineer
Institute for Exploration
jim@whmsi.com

Mary Nichols
Video Technician
Institute for Exploration

3 - 3:45 pm QuickTake

Virtual Reality and Art Education: Experiments at the Ingenuity Festival Room 157

The Cleveland Museum of Art's pavilion at the Ingenuity Festival showcased a variety of innovative technologies including: a hologram of the 5,000-year-old Stargazer, an autostereoscopic animation of a 14th-century Table Fountain, and a stereoscopic video of an 18th-century French writing desk. To create the hologram, 200 photos of the Stargazer were taken over a 60-degree arc resulting in a spectacular integral hologram. The animated Table Fountain allowed viewers to envision gears turning, water flowing, and bells ringing in this one-of-a-kind object. Rendering nine different views for the autostereoscopic display allowed for 3D viewing without special glasses. The stereoscopic video of the French writing desk was an experiment in art object interpretation and demonstrated an extraordinary collaboration among artists, technologists, and curators as well as a unique viewer experience. This presentation outlines the technical and aesthetic challenges that went into creating these works.

Jared Bendis
Case Western Reserve University
jared.bendis@case.edu

Leonard Steinbach
The Cleveland Museum of Art

3 - 3:45 pm QuickTake

Neurological Gaming Environments Room 157

Dream Dreaming is an interactive, three-dimensional, neurological gaming environment that uses IBVA4, the latest version of the Interactive Brain Wave Visual Analyzer, a brain wave interface system. This intelligent game contains 3D objects that are animated by brain waves.

The object of Dream Dreaming is to use brain wave activity to move a boat into water in the 3D environment, which is accomplished by being in a coherent theta or delta mental state. The lower and more coherent the brain wave frequency, the deeper the boat moves into the

water, and a spirit object begins to surface. As the brain-wave signals switch to higher frequencies, the boat comes out of the water and appears on the screen again, as the spirit object disappears.

Paras Kaul
Hyperspace Technology, Inc.
brainwavechick@earthlink.net

Masahiro Kahata
Psychic Labs, Inc.

3 - 3:45 pm QuickTake

Stereoscopic Visualization of Scientific and Medical Content Room 157

A stereoscopic display medium is now used at the Ruth Lilly Health Education Center in Indianapolis to help educate nearly 100,000 K-12 students annually. This presentation includes a description of content-research procedures, pre-visualization methods, production methods, stereoscopic creation techniques, production issues, and post-production methods.

Albert William
Indiana University
almwilli@iupui.edu

Darrell Bailey
Indiana University/Purdue University at Indianapolis

3:30 - 4 pm Paper

Attentive Interaction Design Toolkit Room 156

This vision-based input toolkit helps visual artists and designers develop interactive art installations. It creates a text interpretation of human facial gestures that can be interpreted by any application for interactive uses. This allows users with programs such as Adobe Flash to use head movements and expressions as input. A four-day workshop demonstrated that Flash designers with no other experience in user interface design or computer vision could competently make interactive spaces (TaiKer-KTV and ScreamMarket) based on body motion.

Chia-Hsun Jackie Lee
Ted Selker
Jon Wetzel
Massachusetts Institute of Technology Media Lab
jackylee@media.mit.edu

Wednesday, 2 August

4 - 4:30 pm Paper

Kids Connect Room 156

Kids Connect is a series of summer workshops that culminates in an original performance by young people in distributed locations (the pilot project includes kids in New York, Tampa, Florida, and Amsterdam). Kids from each city are taught theatrical and technology-related skills in a workshop, facilitated by media and theater artists, to create a performance that occurs both live in theaters and online. The entire process of the show is collaboratively created by the youth involved, from storyboarding and concept creation to performing and online stream mixing. Through art, media technology, and the internet, kids can connect with kids in other countries and construct a connected performance while creatively learning about other cultures.

Josephine Dorado
ZoomLab
josephine@zoomlab.org

4 - 5 pm Panel

Touch, Toys, and Interactive Materials: Combining Art and Technology to Spark Creative Thinking Room 157

Electronic toys, construction kits, and art supplies typically live on different aisles in the toy store. But that need not be the case.

The MIT Media Lab has been investigating new multi-modal interactive toys and interfaces that utilize gesture and the sense of touch to improve interpersonal communication, education, and access to digital information. Kids can use these toys and interfaces to create musical sculptures, interactive jewelry, dancing creatures, and other artistic inventions, and, in the process, learn important math, science, and engineering concepts.

Mitch Resnick and Hayes Raffle demonstrate and discuss new construction kits that integrate art and technology to spark children's creative thinking.

From toy idea to market: Janese Swanson shares strategies on bringing concepts to market. She produced many award-winning products, including *Where in the World is Carmen San Diego?* and invented top-selling toys such as Yak Bak, Talk Boy fx, and Girl Tech's Password Journal (after finding that so many wonderful technology products were developed for and marketed solely to boys).

Janese Swanson
SIGGRAPH 2007 Educators Program Chair
The Art Apprentice

Mitch Resnick
Hayes Raffle
Massachusetts Institute of Technology Media Lab

4:30 - 5 pm Paper

An Immersive Virtual Environment for Learning Sign Language Mathematics Room 156

This paper describes development of a new immersive 3D learning environment to increase mathematical skills of deaf children. The application teaches mathematical concepts and American Sign Language math terminology through user interaction with fantasy 3D virtual signers and environments. The program can be displayed in immersive devices and includes a gesture control system comprised of a pair of pinch gloves and a six-degrees-of-freedom wrist tracker.

Nicoletta Adamo-Villani
Ed Carpenter
Purdue University
nadamovi@purdue.edu

5 - 5:30 pm QuickTake

Converting Text to Animated Sign Language Room 156

A combination of online information and offline software that bridges a disability divide to help people learn sign language. The system converts typed text to animated sign-language sequences.

A chat interface enables people-computer-people interaction that makes learning sign language easy and enjoyable. It also expands awareness of digital systems among people with hearing and speaking disabilities.

Bipin Bagavat
Motionsonique
agravab@yahoo.com

5 - 5:30 pm QuickTake

A Data Visualization Course at an Art School Room 156

An online class at the Minneapolis College of Art and Design provides a visual, intuitive, hands-on understanding of statistical data presentation suitable for art students. Formal mathematics is kept to an absolute minimum. The curriculum is divided into three sections: fundamentals of what graphs mean, three graphical designers, and state-of-the-art visualization. A system developed at MCAD is used to encourage community-building and mutual critique in an online environment. The class is now its third year and is doing well.

Peter Border
Minneapolis College of Art and Design
border@mail.physics.umn.edu

5:30 - 6 pm Paper

A Photorealistic 3D Virtual Laboratory for Undergraduate Instruction in Microcontroller Technology Room 156

This new 3D photorealistic virtual laboratory for undergraduate instruction in microcontroller technology, developed using state-of-the-art interactive computer animation technology, operates and produces results equivalent to the physical laboratory. It is the most realistic and advanced computer-simulated laboratory developed so far for microcontroller instruction. The virtual lab solves many of the problems associated with traditional lab instruction by providing: 24/7 access to lab equipment and experiments, effective laboratory training at distance, and lab accessibility to students with motor and vision impairments.

Nicoletta Adamo-Villani
Ed Carpenter
Purdue University
nadamovi@purdue.edu

Thursday, 3 August

8 - 8:30 am

Paper

Entered Apprentice: A Luddite Factory for Undergraduate Learning in Computer Animation Room 156

This research seeks to use the underpinnings of Free Masonry, specifically its method of symbolically applying the principles of architecture and operative masonry to the science and art of character building, to construct a series of levels that will compel learning through failure.

Although the initial application has been in 3D computer animation, the need to synthesize raw data and construct compelling narratives will transcend disciplines. In many ways, information technology and the automation which accompanies it, has diminished the amount of failure in our traditional learning model. Three-dimensional animation, specifically, has grown increasingly reliant on tutorial models that achieve isolated outcomes without implanting abstract knowledge. The decoding of Masonic language can become a model cipher for constructing effective learning in the forthcoming conceptual age.

Bill Hill

Jacksonville University
whill@ju.edu

8 - 9 am

Quicktake Panel

Designing Visual Information for a Global Audience Room 157

The web has evolved into a virtual global community. Cultural differences require localized translations of content for accurate information exchange. These localization systems maintain the validity of the information but at an exorbitant cost and demand on resources. Is there a more efficient solution to localizing content? Can new media designers push the visualization of information to communicate effectively with a global audience? This paper reports on teaching cross-cultural communication in interactive design at the Rochester Institute of Technology.

Chris Jackson
Nancy Ciolek

Rochester Institute of Technology
cbjpd@rit.edu

8 - 9 am

Quicktake Panel

K-12 Mediated Education With SMALLab Room 157

A research group at Arizona State University is undertaking a long-term initiative to develop mediated environments and curricula for K-12 education that utilize learning methods and outcomes from the both the arts and sciences. A central goal of the work is development of a new tool for experiential education, the Situated Multimedia Art Learning Lab [SMALLab]. The framework is low-cost, re-configurable, and can be installed in classrooms or community centers. The initiative emphasizes development of an open environment that leverages naturally expressive, multimodal interaction through sound and movement.

David Birchfield

Roger Bedard

Wilhelmina Savenye

Harvey Thornburg

Arizona State University
dbirchfield@asu.edu

8 - 9 am

Quicktake Panel

Designing a Multimedia Center for Everyone: The Freedman Center Room 157

The Freedman Center is Case Western Reserve University's new multimedia lab for faculty, staff, and students. It provides the tools and experiences they need to create dynamic multimedia presentations. But designing a center for an audience with such a wide variety of needs, interests, and skills can be a challenge. In addition to creating a friendly and useful environment, the center must also focus on maximizing its limited resources.

The center has taken a middle of the road approach to hardware and software. Everything (for the most part) in the Freedman Center is affordable, so the equipment is friendly (not scary) and very accessible for those who want to purchase their own.

This presentation outlines some of the processes that went into developing the center, challenges related to implementation, and some success stories.

Jared Bendis

Case Western Reserve University
jared.bendis@case.edu

8:30 - 9 am

QuickTake

Using Virtual Reality Simulations as a Research Tool to Study Empathy, Problem Solving, and Perspective Room 156

Simulations in virtual environments are becoming an important research tool for educators. They can be used in variety of areas, from the study of emotions and psychological disorders to more effective training. This study uses animated narrative vignette simulation technology to observe a classroom situation: a low-level aggressive peer-to-peer victim dyad. Participants were asked to respond to this situation as if they were the teacher. Their responses were coded and analyzed. Consistent with other literature, the pre-service teachers expressed very little empathic concern, problem-solving, or management of the situation with the victim. Future direction and educational implications are presented.

Sharon Tettegah

Simon Meistninkas

Kona Taylor

Eun Won Whang

University of Illinois at Urbana-Champaign
stettega@uiuc.edu

8:30 - 9 am

QuickTake

Virtual Reality for Ecosystem Dynamics Education Room 156

An immersive interactive virtual environment created to educate students about ecosystem dynamics. Traditional tools and methods for teaching theories regarding these dynamics use 2D static images that cannot adequately display the complex nature of the interactions that take place in the ecosystem, so students can not easily understand the underlying theory. An immersive interactive environment can help overcome these difficulties by allowing students to view a 3D simulation and interact with it in real time to understand the effects of changes to the ecosystem.

Laura Arns

Matt Brisbin

David Foldes

Jeffery D. Holland

Purdue University
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Thursday, 3 August

9 - 9:30 am

Paper

Attribute Activation: An Approach for Learning Visual Representation

Room 157

Attribute activation is a technique based on cognitive theory that can be used in constructing and critiquing visual images. It is meant to slow students down to systematically process an image or consider the important elements that need to be part of a portrayal. This paper includes a literature review that explores the power of visual literacy for learning; individual differences in visual processing, visual selectivity, visual problem solving, and attribute activation theory; how new media and technology can be used to enhance this technique; and the implications for visual education.

Marlo Steed

University of Lethbridge
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9 - 9:30 am

Paper

The Graphics Teaching Tool

Room 156

Being a literate citizen requires at least a basic understanding of computer graphics principles. One must be able to critically evaluate digital visual materials, make decisions using digital visual representations of data and ideas, and use computers to create effective visual communications. Existing curricular resources, however, are mainly aimed at students in computer science and related fields. For the majority of students, who do not pursue technical degrees, there is virtually no recognition of the importance of basic graphics principles or even reference to their existence. A novel interactive graphics teaching tool (GTT) addresses the needs of this audience. The GTT is a Java-based application (and applet) that offers 2D and 3D graphics in a single environment. It is expressly designed for teaching and uses a mental-model-based pedagogical approach not found in commercial graphics software.

Anne Morgan Spalter
Dana K. Tenneson

Brown University
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9:30 - 10 am

Paper

Computer Graphics, Interactive Technologies and Collaborative Learning Synergy

Room 157

Using interactive technologies, computer graphics, and collaborative learning synergy to improve knowledge. In this project, interactive graphics techniques and tools, including learning theories and methodologies such as experiential learning, were used to enhance children's interest in studying and authoring content in subjects such as mathematics, geography, geometry, languages, and arts.

This human and technical interaction generated improvement in several areas: individual traditional and digital literacy skills, social inclusion, curriculum development, and collaborative work inside and outside the school environment.

Jorge Ferreira Franco
Roseli de Deus Lopes

Universidade de São Paulo
musiquarium_2000@yahoo.com

9:30 - 10 am

Paper

A Framework for Teaching Fundamentals of Time-Based Design

Room 156

A theoretical and experimental investigation of the fundamentals of time-based design. This paper promotes discussion of a dynamic visual language that could be used in various disciplines involved with the creative process of image-making in a dynamic medium. Time-based projects, whether for communicating information or for artistic purposes, rely on understanding and exploration of the core principles of dynamic formations. This paper introduces the theoretical framework while presenting a series of interactive experiments and short movies developed with the purpose of analyzing the theory. It includes student work that reflects the learning process in time-based design courses.

Isabel Meirelles

Northeastern University
m.meirelles@neu.edu

10 - 10:30 am

Paper

Evaluating Interactive Gaming as a Language Learning Tool

Room 157

A methodology for evaluating second-language acquisition in the context of massive multi-player online role-playing games (MMORPGs). MMORPGs accommodate active learners who assume the role of characters they have selected, create immersive environments that promote the development of conceptual knowledge, and engage players in social interaction in a community of players. Because role-playing games support social interaction among players, MMORPGs can be a catalyst for fostering students' foreign language competence as students participate in conversational discourse. This is an interesting and underutilized learning environment for second language acquisition. This paper introduces an evaluative methodology for Ever Quest II as a pedagogical tool for students who are learning English as a second language.

Yolanda Rankin

Northwestern University
yrankin@northwestern.edu

Rachel Gold

Brown University

Bruce Gooch

Northwestern University

Thursday, 3 August

10 - 10:30 am

Paper

Teaching Strategies and Assessment Measures for Rapidly Changing Technology Room 156

Technology changes rapidly in the computer graphics field, and faculty members find themselves continually updating and changing their courses to keep up with current changes in the technology. Many problems can arise in assessment while keeping up with the technology, to the point where some assessment measures may become obsolete. In response to that, this paper explores a number of questions that deal with the issue of rapidly changing technology within the learning situation and assesses a program in this type of environment. It also addresses: How does an educator keep up, and what is the significance in teaching the old technology vs. the new or upgraded technology? How do educators assess student success? How does an educator assess the technology skill level and set a base for continued course assessment throughout a degree program?

Jana Whittington

Kim J. Nankivell

Purdue University Calumet
janaart@mac.com

10:30 - 11 am

Paper

Virtual Reality-Based Spatial Skills Assessment and Its Role in Computer Graphics Education Room 156

Development and refinement of assessment devices to examine human spatial skills is critical as 3D computer graphics become more common in educational settings. This work examines the use of traditional paper-based assessments used to examine 3D constructs and abilities, and how instruction in a stereoscopic, immersive environment will cast light on a more accurate assessment of those abilities.

Nathan W. Hartman

Gary R. Bertoline

Purdue University
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10:30 - 11:30 am

Panel

Seeing the Unseen: Visualization and Education Room 157

From its earliest days, ACM SIGGRAPH has focused on the importance of information visualization and on the use of interaction to aid and reinforce learning and understanding. This panel focuses on examples of using visualization at the university and high school levels. It reviews some of the history and potential of visualization in varied courses and settings, and it considers a well-established use of visualization (in teaching mathematics) and, in another case, beginning instruction in visualization, computer graphics, and related technologies at the high school level (teaching art, technology, and other subjects). Recent research findings are reviewed, and case studies suggest future developments in the use of visualization in educational settings.

Thomas G. West

Krasnow Institute
thomasgwest@aol.com

James Martinez

Wye River Upper School

J. Jerry Uhl

University of Illinois

11 - 11:30 am

Paper

Modeling Art History: Exploring Edward Hopper's Nighthawks Outside and In! Room 156

An interdisciplinary approach to group collaboration, research methods, and critical thinking for a freshman computer graphics class using a 3D modeling tool to solve an art history problem. The approach also challenged the group to explore modeling technology they had not yet learned and create a series of documents to archive the project and process.

Inspired by Rutgers University's SIGGRAPH 2002 and 2003 presentations, as well as the animated Vermeer exploration from the Computer Animation Festival, students are assigned a painting and asked to research it, the painter, and the subjects, and produce a 3D model of the world of the painting. This session shares the results of the exploration of Edward Hopper's famous painting, Nighthawks. The full series of projects summarized in this presentation includes theater design problems, architectural visualization problems, and more.

John C. Finnegan

Purdue University College of Technology
at New Albany
finnegan@purdue.edu

Carley Augustine

Purdue University College of Technology
at South Bend

Richard Kopp

Purdue University College of Technology
at New Albany

11:30 am - noon

Paper

Situational Learning in Real and Virtual Space: Lessons Learned and Future Directions Room 156

This work started with informal observation of my daughter as she actively inquired about the world around her. Her seemingly innocent questions have profound implications for real-world science education. How could these common daily information seeking behaviors be supported or augmented and transferred to a virtual- or augmented-reality application for education and knowledge acquisition? How can we make this an effective approach? What research has already been done? This paper highlights key educational research and reviews important empirical findings in virtual reality and other computer graphics technologies. Based on recent literature and user interface design experience, a list of design heuristics and recommendations is recommended to virtual-reality educators and software developers. The paper also includes a summary of future research opportunities and challenges.

Maria C.R. Harrington

University of Pittsburgh
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Thursday, 3 August

11:30 am - noon

Paper

The Next Generation of Digital Art: Current Student Works in Japan

Room 157

Since the 1960s, Japanese digital artists have been internationally recognized for their pioneering work. In 2002, media art and its subfields were introduced as required topics in junior and senior high school art classes. As a result, the digital arts, including computer graphics, have been demonstrating broader acceptance and diversity. The Japanese government has started supporting media art, and today's Japanese art students, whose works have been highly evaluated even overseas, are entering a new phase of creativity. This paper reports on the current education and support system for media art in Japan and considers the future of emerging talents by examining examples: the student section of the Media Arts Festival, next: New Generation of Media Artists (shown in a media art museum at the NTT InterCommunication Center), GLOBAL MEDIA (shown at the Tokyo Metropolitan Museum of Photography), and the Meta-Visual Educational Kit.

Tomoe Moriyama

The University of Tokyo/Curator, Tokyo Metropolitan Museum of Photography
DZD00256@nifty.com

1 - 2 pm

Forum

Issues in Computer Graphics Education

Room 157

This session examines the issues of 3D education, focusing on how the art of 3D is evolving from the art of animation. Despite a booming industry, most 3D graduates have tremendous difficulty getting even entry-level jobs. This discussion analyzes animation programs, the most common source of 3D education, to reveal why their students compete less successfully than students of computer science, design, and other bachelors degree programs.

The solution is to distinguish 3D from animation by creating a new discipline. This 3D discipline should retain the artistic components of animation but place greater emphasis on problem solving, 3D expression, and computer programming. A new approach would not only strengthen chances of employment for graduates within the entertainment industry and other fields like visualization and education. It will also empower

graduates, broaden societal perceptions of 3D, and provide the next generation of leadership in the digital age.

C.R. McCracken

Georgia State University
crmccracken@yahoo.com

1 - 2 pm

Forum

Right Brain/Left Brain: Balancing Digital Art Curricula

Room 157

Developing curriculum for digital art programs is an evolutionary process. Technology is constantly changing and creating a need for new courses, or revision of old ones. The level of digital literacy of students entering both undergraduate and graduate programs is also continuing to rise. Traditional art programs contained components of theory, art history, critique and studio work. Digital art programs have additional components that focus on software instruction and technological literacy. The goal of this forum is to help attendees gain a better understanding of how to balance all of these elements to provide the best possible educational experience for the student. It encourages participants to share ideas and opinions on how their curricula have changed and what they see as important trends for the future.

Bruce Wands

School of Visual Arts
brucewands@aol.com

1 - 2 pm

Forum

Should an Introduction to 3D be Required of all Undergraduate Majors in Design?

Room 157

In the SIGGRAPH community, we take it for granted that a working knowledge of 3D computer graphics is a valuable if not necessary part of preparing design graduates for job opportunities in an industry where 3D is a significant part of game design, motion-picture production, web3D design, even graphic design or PDA content. What if there is not a consensus among the design faculty? What if some faculty feel a 3D core requirement is a waste of time, and that it consumes precious credit hours from other courses that are more relevant to a concentration? What if undergraduate graphic design majors complain that they don't understand why they have to suffer through an introductory course in MAYA?

What are the arguments for or against a mandatory introductory 3D course as a general core requirement?

Gregory Garvey

Quinnipiac University
greg.garvey@quinnipiac.edu

1 - 1:30 pm

Paper

Immersive Chemistry Video Game

Room 156

This paper details the process used by a research team at Purdue University to design an educational chemistry video game sponsored by the National Science Foundation. The project presented significant challenges because the research team had to integrate the design process used by traditional video game developers and the process used by instructional designers.

The goal of the project is to create a set of research-validated recommendations for development of science-centric video games. In the course of conducting the research, the team created a 3D first-person-shooter immersive video game that requires players to utilize knowledge in chemistry to progress through the game world. The design process allowed artists and instructional personnel to create the design documents required to make an immersive educational video game. The paper includes results from human-subject testing.

Carlos Morales

Kellen Maicher

Ryan Pedela

Gabriela Weaver

Purdue University
morales@purdue.edu

1:30 - 2 pm

Paper

Shapes: Allowing K-12 Students to Work in 3D

Room 156

The Shapes program allows kids of all ages to create their own interesting and compelling 3D scenes. By gently and subtly weaving Cartesian coordinates throughout the program, the kids learn about X, Y, and Z without even knowing they are learning it.

Mike Bailey

Oregon State University
Mjb@eeecs.oregonstate.edu

Steve Lukas

Soapbox Mobile, Inc.

Rozeanne Steckler

Oregon State University

2 - 2:30 pm

Paper

Kids' Programming Language: Learning is Best When Learning is Fun

Room 156

Computer science enrollment in the US has dropped by two-thirds in the last five years. One of many reasons for this is that for 20 years software development tools have become increasingly powerful and complex. More and more, they are intended for experienced programmers. Kids' Programming Language (KPL) provides a language and IDE designed to allow beginners to learn real computer programming skills. It uses games and graphics to interest and excite beginners. And it offers an IDE and development model that is based on modern standard IDEs, but is much simpler and more accessible. KPL's global volunteer community has translated the IDE into 15 languages in just the first six months of its availability and translated or produced many tutorials, examples, and learning materials. KPL's applicability to beginners of any age is clear, and changes and new materials under development now will broaden KPL's applicability to all ages and education levels.

Jon Schwartz

Morrison Schwartz, Inc.
jon@kidsprogramminglanguage.com

2 - 2:30 pm

Paper

Making of an Interactive Teaching Gem

Room 157

Current educational repositories lack interactive material. This paper describes the full pipeline for creating an interactive teaching gem in computer graphics and related domains. Based on experiences from classroom use, the paper explains why and how learning objectives were specified, how unit tasks were set up, design interactivity levels, and source code for homework. The pipeline is illustrated with production of a real interactive teaching gem. The paper also summarizes implications for computer graphics educators and current community building efforts, and formulates two matching repository services.

Frank Hanisch

Wolfgang Strasser

WSI/GRIS Universität Tübingen
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2:30 - 3 pm

Paper

Incorporating Higher Education Computer Animation Principles Into Primary Education Math Systems

Room 156

Animation is founded on mathematical systems and equations. To effectively engage middle school math students in a problem with tangible results, the authors developed a project involving both college undergraduates and eighth-grade students in an activity that combined concepts in mathematics (algebra, ratio, proportion, estimation) and computer-generated visualization.

Lisa Kilmer

Purdue University
lkilmerd@purdue.edu

Stephanie Schields

Westridge Middle School

2:30 - 3:30 pm

Forum

A Knowledge Base for the Emerging Discipline of Computer Graphics

Room 157

Four years ago, the ACM SIGGRAPH Education Committee designated a working group to propose a knowledge base/ curriculum specific to the emerging discipline of computer graphics. As it nears completion of that effort, the working group presents its work to a broader audience of educators, students, and industry professionals for feedback and open dialog.

Tony Alley

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Cary Laxer

Rose-Hulman Institute of Technology

Tereza Flaxman

Joe Geigel
Rochester Institute of Technology

Susan Gold

Sierra Nevada College

Lewis Hitchner

California Polytechnic State University

Genevieve Orr

Willamette University

Bary Pollack

Sierra Nevada College

3 - 3:30 pm

Paper

An Interactive Virtual Environment to Communicate Vesuvius Eruptions: Numerical Simulations and Pompeii History

Room 156

A visual analysis and communication system that allows interaction with numerical simulations that model complex natural phenomena, such as volcanic eruptions, within their natural environments. This case study is related to Vesuvius, the volcano near Naples, Italy that occurred in 79 A.D. The volcano is currently being monitored to assess future eruption risks.

The goal is to create a user-friendly interface to communicate and explain the potential impact of a future eruption and cultural data and meta-information (GIS data, historical sources, virtual archaeology reconstructions, etc.). The virtual Vesuvius interactive environment is designed for multi-platform and multi-channel portability. The interaction can be conceived for immersive graphics devices in virtual theaters or virtual TV sets that can make content available to a broader audience.

Antonella Guidazzoli

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Marina Bisson

Augusto Neri

Istituto Nazionale di Geofisica e Vulcanologia

Luigi Calori

Carlo Cavazzoni

Francesca Delli Ponti

Tiziano Diamanti

Roberto Gori

Silvano Imboden

CINECA

Maria Teresa Pareschi

Istituto Nazionale di Geofisica e Vulcanologia

3:30 - 4:15 pm

ACM Student Research Competition Recognition

Room 156

4:15 - 5 pm

Ramp Out: SPACE-TIME Student Poster and Animation and Interactive Competition Recognition

Room 156

Art Gallery: *Intersections*

intersect with creative, conceptual, and innovative digital art that explores new territories and crosses traditional boundaries. The *Intersections* exhibition features 2D, 3D, and 4D wall-hung artwork, sound art, installation art, sculpture, electronically mediated performance, art animation, and screen-based interactive work from artists around the world. As a tribute to the pioneering efforts of Charles A. Csurí, the gallery is hosting an extensive retrospective of his digital artwork from 1963 to present. The *Intersections* exhibition also features presentations of theoretical art papers, digital art panels, and art sketches (artist talks).

Bonnie Mitchell
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Thomas Haegele
Filmakademie
thomas.haegele@filmakademie.de

Elainie Lillios
Bowling Green State University
lillios@bgnet.bgsu.edu

Susan Weisshaar
Bowling Green State University
Weiss@bgnet.bgsu.edu

Sunday, 30 July

3 – 5:30 pm
**Art Gallery &
Emerging Technologies
Opening Reception**
Sponsored by City of Boston,
Thomas M. Menino, Mayor

Open to the general public

Off Site Events

Sunday, 30 July

7:30 – 9:30 pm
**The CG Performance
and Opening Barrel Ceremony**
Boston Marriott Copely Place,
Salon A-E, 4th Floor
110 Huntington Avenue
Boston, Massachusetts
**The reception is open to all
attendees.**

Monday, 31 July

7 – 9 pm
**The Upgrade! Boston
New Media and the Poetics
of Communication**
Art Interactive
130 Bishop Allen Drive
Cambridge, Massachusetts

Art Gallery: Presentations

Room 207

Local Art Events

Urban Networks at Art Interactive 9 June – 6 August

Saturday and Sunday, noon – 6 pm
Art Interactive
130 Bishop Allen Drive
Cambridge, Massachusetts

3D to 2D at AXIOM Gallery 29 July – 20 August

Friday, Saturday, and Sunday, 2 – 6 pm
Axiom Gallery
186 Hampshire Street
Cambridge, Massachusetts

The 2006 DeCordova Annual Exhibition

29 April – 20 August

Tuesday – Sunday, 11 am – 5 pm
DeCordova Museum and Sculpture Park
51 Sandy Pond Road
Lincoln, Massachusetts

Under Cover: Artists' Sketchbooks

1 August – 22 October

Monday – Saturday, 10 am – 5 pm
Sunday, 1 – 5 pm
Fogg Art Museum
32 Quincy Street
Cambridge, Massachusetts

Made in America

1 – 26 August

Tuesday – Saturday, 10 am – 6 pm
judi rotenberg gallery
130 Newbury Street
Boston, Massachusetts

Group Show

13 July – 19 August

Tuesday – Saturday, 10 am – 5:30 pm
Howard Yezerski Gallery
14 Newbury Street
Boston, Massachusetts

Laura McPhee: River of No Return

13 May – 17 September

Saturday, Sunday, Monday, and Tuesday,
10 am – 4:45 pm
Wednesday – Friday 10 am – 9:45 pm
Museum of Fine Arts
465 Huntington Avenue
Boston, Massachusetts

BODY WORLDS 2

30 July – January 2007

Saturday – Thursday, 9 am – 5 pm
Friday, 9 am – 9 pm
Museum of Science
Science Park
Boston, Massachusetts

Multilingual Tours

To join a tour of the Art Gallery and Emerging Technologies in your language, please meet five minutes before the tour begins at the Art Gallery entrance in Hall B1. Spaces are limited and are available on a first-come, first-served basis.

Monday, 31 July

9 – 9:45 am	Chinese: Mandarin
10 – 10:45 am	Japanese
11 – 11:45 am	Korean

Tuesday, 1 August

9 – 9:45 am	German
10 – 10:45 am	French
11 – 11:45 am	Spanish
2 – 2:45 pm	Japanese
3 – 3:45 pm	Korean
4 – 4:45 pm	Chinese: Mandarin

Wednesday, 2 August

10 – 10:45 am	Spanish
11 – 11:45 am	Chinese: Mandarin
noon – 12:45 pm	Korean
2 – 2:45 pm	Japanese
3 – 3:45 pm	French
4 – 4:45 pm	German

Thursday, 3 August

9 – 9:45 am	Korean
10 – 10:45 am	Chinese: Mandarin
11 – 11:45 am	Japanese

Sunday, 30 July

The Art of Simulation, Evolution, and Distributed Systems

8:30 – 10:15 am

Art Sketches

Fluid Simulation and Global Illumination in Open House

New techniques in Open House (SIGGRAPH 2006 Art Gallery) involved simulating a localized unstable fluid interface and computing smooth global illumination over 355,203 primitives with deep shadows.

Mark J. Stock

University of Michigan
mstock@umich.edu

Toward Greater Artistic Control for Interactive Evolution of Images & Animation

Several improvements to interactive evolution (IE) of images and animation strengthen the IE toolset and give artists greater control. Artwork using these techniques is presented in the SIGGRAPH 2006 Art Gallery.

David Hart

dahart@gmail.com

Digital Chronophotography

A digital application of chronophotography developed in OpenGL to capture unique images representing the evolution of a simulated Society of Stickpeople (SIGGRAPH 2006 Art Gallery).

Nathan Selikoff

Digital Awakening Studios
nselikoff@gmail.com

Dreams in High Fidelity

Dreams in High Fidelity (SIGGRAPH 2006 Art Gallery) is a painting that evolves. It was designed and rendered with the Electric Sheep screen-saver, a collaboration of 30,000 computers and people mediated by a genetic algorithm.

Scott Draves

SPOTWORKS
siggraph@draves.org

Art Gallery: Presentations

Room 207

Sunday, 30 July

Locative Media: Urban Landscape and Pervasive Technology Within Art

10:30 am - 12:15 pm

Art Panel

Locative media: the utilization of pervasive, portable, networked, location-aware computing devices that allow for user-defined mapping and artistic intervention within urban geographies, transmuting them into an experimental canvas. This panel examines the current or future state of locative media practice, establishing an artistic and theoretical discourse on pervasive computing. The advent of an always-on, always-accessible information sphere creates an enhanced reality that enables connected artists to work within different spaces and geographies, creating work that is simultaneously global and local. Can we shift the balance of power, redistributing media control so as to create an open space where public art, social projects, and free expression can flourish?

Chair

Michael Salmond

Northern Illinois University
Illinois, USA
stresspuppy@gmail.com

Panelists

Hasan Elahi

Rutgers University
New Jersey, USA

Mike Phillips

University of Plymouth
Plymouth, United Kingdom

Carlos Rosas

Pennsylvania State University
Pennsylvania, USA

1:45 – 3 pm

Art Papers

Session Chair: Paul Hertz

Flashimation: The Context and Culture of Web Animation

The purpose of this paper is to explore the origins and effects of Flash animation. It examines the forces that turned animators toward the web, Flash's visual style and the meanings with which it is associated, and the result this turn has had on modern animation and the current animation community. Though it is a recent popular development, the lineage of Flashimation can be traced to advances in technology throughout the past half-century, with television and the internet acting as the catalysts. In both cases, these advances involved development of a new visual and animation style from technological constraints. As a result, the medium of Flashimation has developed a contextual association that extends beyond its simple visual style. A focus of this paper is this intersection of content and medium.

It also examines how this interplay divides the modern animation community.

Dan L. Baldwin

Purdue School of Engineering and Technology, IUPUI
Indiana, USA
danbaldw@iupui.edu

Co-Authors

Michael S. Daubs

The University of Western Ontario
Ontario, Canada

John B. Ludwick

Indiana University School of Informatics, IUPUI
Indiana, USA

Drunk on Technology, Waiting for the Hangover

With spam and porn as its most egregious growth industries, the utopian bloom has faded from the internet. Though it was long suspected that culturally determined signs of identity and their attendant privileges, ironies, and afflictions were bound to persist in the virtual world, for one giddy moment the vision of a world bound together by an emerging networked consciousness hovered over the future. Now that the party's over, we wonder how long our heads will ache. Can we think our way back or forward to a vision that can sustain, unite, or direct us, or are we left with passive consumption of a reality fabricated by forces beyond our control? Rather than answering the question (too big a project), this essay attempts to assemble a seedbed where ideas might grow and be tested. It uses a combinatorial structure to pair "plants" with "fertilizers" to produce the germs of critical ideas.

Paul Hertz

Northwestern University
Illinois, USA
paul-hertz@northwestern.edu

Painting in a Digital World:

I Told You So

A question mark hangs over the category of digital painting. The use of Photoshop and Painter has spread so far among contemporary painters that it is taken for granted. It may be little more than scan, adjust, print, and copy, but who wants digital virtuosity for its own sake? It is no longer new technology, but background technology. Does it still make sense to think of the "digital artist" as working at some remove, as advanced? Does the digital artist have to be at the edge to be impressive, tied in with an experimental application? Doesn't mainstream art have its own set of edges? Who are the dilettantes?

As the categories dissolve, the prospect opens up some interesting exhibitions: a new dialogue with what used to be dismissed as "traditional" painting. Digital shows will need to lighten up, drop the flashy graphics and the futurology. A critical overview is overdue, with artists telling their own stories, and critics arguing for

their preferences. As non-digital art and digital art continue to overlap, it is time to do without the defensive barriers.

James Faure Walker

University of the Arts, Camberwell
London, United Kingdom
james@faurewalker.demon.co.uk

Monday, 31 July

8:30 – 10:15 am

Art Papers

Session Chair: Ernest Edmonds

Meta-Visual/Media/Space-Algorithmic "Intersection": the new aspect of media art exhibition

The main subject of this paper is a new methodology in exhibition design and analysis in the field of digital art/media art - a type of "intersection." It examines the past and future of image media history, and it explores various encounters, hybrid remixes, and effective fusion between various fields such as art and science.

The paper describes media art exhibitions using background data and the investigation of cultural media facilities. The author carried out this research over two years (2003-2004), as a member of the Media Arts Research Committee, Japan Ministry of Education and Science. The paper also investigates numerous media art exhibitions over the past 10 years at the Images & Technology Gallery in the Tokyo Metropolitan Museum of Photography.

The digital art/media art exhibition plan, which focuses both on media history and media artists' work, involves questions of how to construct the space, install each work, organize the touring exhibition, and obtain feedback from visitors. Although this investigation was mainly aimed at media art facilities in Japan, the investigation uses a genetic algorithmic method that could be universally applied to other venues in this field. Finally, the paper proposes a new technique that can be used in future digital art/media art exhibitions to make the field more popular and universal.

Tomoe Moriyama

Tokyo Metropolitan Museum of Photography
Tokyo, Japan
DZD00256@nifty.com

New Media, New Craft?

This paper is a reflective study, which considers the use, role, and status of computer programming (when used in a creative context) within the broader context of the ideals and ethos of the late 19th century Arts and Crafts Movement. It seeks to draw comparisons between the role of programming as a means of understanding and manipulating the "material" of the computer environment, and the ethos and attitudes of the craft environment in which artists work with traditional materials. Looking beyond the physical differences between the types of process and artefact

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involved, this study highlights important areas of commonality of mental approach and attitude which link the ethos of traditional crafts with that of computational artists and designers. It is the contention of this paper that programming, like the traditional crafts, provides a way in which creative people can manipulate or "sculpt" the material of the computer environment. Although it is a reflective and analytical study, the foundation for this discussion derives from creative practical experience and expresses a concern that the role of programmer simply as "engineer" should, in the light of much creative computational work, be re-assessed and re-examined.

Andrew Richardson
University of Sunderland
Sunderland, United Kingdom
andrew.richardson@sunderland.ac.uk

Marking Space: On Spatial Representation in Contemporary Visual Culture

This paper looks at different ways that space is dealt with in contemporary visual culture and attempts to link these evolving modes of spatial representation to emerging technologies, particularly GPS, GIS, and OpenGL, as well as to suggest links between the depiction and thinking about space in the current moment with similar explorations from the history of late-20th-century avant-garde artistic practice.

In particular, the paper discusses the virtual worlds of video games as new type of spatial narrative, in relation to Lev Manovich's idea of the spatial montage. While this paper is necessarily more suggestive than exhaustive, it attempts to choose contemporary visual practices and practitioners that could stand as representatives for larger tendencies in their respective domains. The paper originated as a somewhat personal document, an attempt to situate the author's recent art practice within a larger historical and cultural context. As such, at times the links between these divergent practices must be made through the sensibility of the author.

Joseph Tekippe
School of Visual Arts
New York, USA
jtekippe@gmail.com

Living Laboratories: Making and Curating Interactive Art

This paper describes the development of laboratory concepts in the making and curating of interactive art. In November 2004, the Creativity and Cognition Studios, University of Technology, Sydney, and the Powerhouse Museum, Sydney, launched an initiative that seeks to realise the concept of the exhibition as living laboratory through the participatory qualities of interactive computer-based art. Beta_space is an experimental exhibition area within the Powerhouse, which extends the interactive art research studios of CCS into the public context. The paper describes the underlying concepts and discusses the methods and challenges that the living laboratory brings to interactive art practice.

Lizzie Muller and Ernest Edmonds
Australian CRC for Interaction Design
Creative and Cognition Studios
University of Technology, Sydney
Sydney, Australia
ernest@ernestedmonds.com

Monday, 31 July

Transmission, Communications, and Connections

3:45 - 5:30 pm
Art Sketches

Is it Alive? Sensor Networks and Art

Art and computer science converge in the investigation of emergence and self organization through the field of sensor networks.

Adam Brown
Andrew Fagg
University of Oklahoma
awbrown@ou.edu

[transmissions]

A contextual, technical, and theoretical summary of Fernando Orellana's recent work, including 8520 S.W. 27th PL., shown in the SIGGRAPH 2006 Art Gallery.

Fernando Orellana
Union College
orellanf@gmail.com

Biophilia

An interactive installation (SIGGRAPH 2006 Art Gallery) in which the viewer's shadow is used to generate organic forms in real time.

Mark Cypher
Murdoch University
m.cypher@murdoch.edu.au

Interaction as the Means and as the Meaning

Heartbeats (SIGGRAPH 2006 Art Gallery) is an interactive installation that uses the participant's pulse to create virtual life. Its essence is its call for involvement rather than passive viewing.

Daphna Talithman
Orna Portugaly
Sharon Younger
daphtal@yahoo.com

Tuesday, 1 August

Beyond Brush and Easel: The Computer Art of Charles A. Csuri From 1963 to present

10:30 am - 12:15 pm
Art Panel

This panel explores the computer art of Charles A. Csuri, an artist recognized by Smithsonian Magazine as "the father of digital art and animation," and includes discussions of his works from 1963 to the present. In this rare opportunity we will also hear reflections from the pioneering artist himself, who is now professor emeritus and artist in residence at The Ohio State

University. This panel is presented in conjunction with the retrospective exhibition Beyond Boundaries: Charles A. Csuri, 1963 – present, which is shown for the first time at SIGGRAPH 2006.

Chair
Janice M. Glowski
The Ohio State University
Ohio, USA
janice.glowski@gmail.com

Panelists
Margit Rosen
Kunsthochschule für Medien Köln
Karlsruhe, Germany

Bruce Wands
School of Visual Arts
New York, USA

Charles A. Csuri
The Ohio State University
Ohio, USA

Transforming the Image Plane: New Processes for Artistic Expression

1:45 - 3:30 pm
Art Sketches

Mosaics and Ukiyotiles

An ukiyotile is a type of mosaic that, like pointillism, is characterized by non-overlapping brushstrokes of organically varying sizes that come together to form a larger image.

Vladimir Sierra
thinkforward.org
vladimir@thinkforward.org

Digital Abstract Images

The aim of my work is to combine digital technology with analog thought. I try to convey psychological and emotional states along with a sense of spirituality.

Hye Kyung Kim
Kyung Hee University
khkyung7@naver.com

Ray Tracings of the In Between

A unique look at a process of prolonged exposure, three-dimensional laser painting. Two works by this artist are on display in the SIGGRAPH 2006 Art Gallery.

Shawn Lawson
Rensselaer Polytechnic Institute
lawsos2@rpi.edu

Insectinsight: A View of Time

Insectinsight is a single, continuous 56-foot long digital print. The artist demonstrates the use of a special camera by imagining the life of an insect.

Ansen Seale
Seale Studios
ansen@sealestudios.com

Art Gallery: Presentations

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Tuesday, 1 August

Innovative Construction of Image and Form

3:45 - 5:30 pm

Art Sketches

Voice Mosaic

The process and technologies used to create the *Voice Mosaic*, a mosaic of colors and voices on the web generated through phonic calls. This work is presented in the SIGGRAPH 2006 Art Gallery.

Martha Carrer Cruz Gabriel

Universidade de São Paulo
martha@martha.com.br

Your Memory Connected

A net.art generator that retrieves online memories based on the user's artistic statements and generates collages from them.

Chao-Ming James Teng

Edward Shen

Pattie Maes

Henry Lieberman

Massachusetts Institute of Technology Media Lab
jteng@media.mit.edu

Hilbert Cube

This space-filling recursive curve that looks like a cubist brain was made of stainless steel and bronze with a new rapid-prototyping process that requires neither molds nor machining.

Carlo H. Séquin

University of California, Berkeley
sequin@cs.berkeley.edu

Designing Symmetric High-Genus Sculptures

A procedure that uses topological mesh modeling and a prototyping machine to create new sculptural forms.

Ergun Akleman

Ozan Ozener

Texas A&M University
ergun@viz.tamu.edu

Wednesday, 2 August

Conceptual Investigation: Technology, Message, and Meaning

8:30 - 10:15 am

Art Sketches

Reading the Space as an Entity

When multiple photos are stitched together into a panoramic image, you obtain a world that can not

be seen by the naked eye at one instance of time, an augmented perception.

Murat Germen

Sabancı Üniversitesi
muratgermen@gmail.com

Annual Checkup: Pharmaceuticals for the 21st Century

A discussion of Annual Checkup, a satirical multimedia art installation (SIGGRAPH 2006 Art Gallery) that features pharmaceutical drugs that can change one's racial identity, strengthen religious faith, and boost patriotism.

Lisa Erdman

Florida Southern College
erdman144@yahoo.com

Shaun Foster

Four Directions Media, Inc.

Virtual Public Art, Animation, and Kosuth

Nineteen images and a one-minute animation that illustrate the artist's investigations into public art and installation that incorporate both actual and virtual space.

Brit Bunkley

Quay School of the Arts
b.bunkley@ucol.ac.nz

Making Exuvia: Media Hybridization as a Method

Collaboration between artists with different backgrounds could open interesting perspectives on art research. Code and new materials generate new synthesis.

Alessandro Capozzo

Katja Noppes

alessandro@ghostagency.net

Listen Up!: Creative Audio and Image Relationships

10:30 am - 12:15 pm

Art Sketches

The reacTable*

An electronic multi-user musical instrument with a tabletop tangible user interface, designed for novices in installations and advanced electronic musicians in concerts.

Sergi Jordà

Martin Kaltenbrunner

Günter Geier

Marcos Alonso

Universitat Pompeu Fabra
sergi.jorda@ua.upf.es

Code

A real-time audio/visual performance system based on keyboard typing. Sounds and images are controlled by inputting the keywords. Typography and geometrical images are in sync with sounds, which produces cool vibes.

Sadam Fujioka

Kyushu University
fucracker@hotmail.com

Osamu Sambuichi

Toshiba Information Systems (Japan) Corp.

Autarkeia Aggregatum: Autonomous Points, Emergent Textures

A visual-music piece that unfolds as a constantly transforming, massed animation of nearly 12,000 individual points. This sketch outlines the technical and aesthetic approach to the work.

Bret Battey

De Montfort University
bret@bathatmedia.com

Ignotus the Mage

Synesthetic art, multimedia, and intermedia have a long but sporadic history as inspirational ideas in the arts. Can digital technologies bring intermedia to the continuum of artistic practices?

Paul Hertz

Northwestern University
paul-hertz@northwestern.edu

Generative and Genetic Art

1:45 - 3:30 pm

Art Panel

Leading experts of generative and genetic art from the past 25 years, all of whose work has been featured at the annual SIGGRAPH conference, examine a range of topics including: chance and creativity, can art be an equation? the procedural and generative software toolbox, artist as god, the creative peaks and troughs of traveling through multidimensional parameter space, and genetic art into genetic engineering? With the growth in multicore computer systems (including game consoles) that are well suited for procedural and generative processes, this panel explores avenues for these genres in 2006 and beyond.

Chair

William Latham

Leeds Metropolitan University
Leeds, United Kingdom
w.latham@leedsmet.ac.uk

Panelists

Karl Sims

GenArts, Inc
Massachusetts, USA

Yoichiro Kawaguchi

The University of Tokyo
Tokyo, Japan

Andy Lomas

Framestore CFC
London, United Kingdom

Art Gallery: Presentations

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Thursday, 3 August

New Interactions: Communities and Information

8:30 - 10:15 am

Art Panel

In coining the phrase "relational aesthetics," the contemporary French art theorist and curator Nicolas Bourriaud attempted to define a trend in creative works that configures interactive scenarios in which everyday experiences are the catalyst for audience-driven participation. This panel explores how the tacit activities of urban living are being used to form the foundations for new types of interaction that exploit community life and information-rich environments. Topics include how "relational interaction" can be facilitated by the potential of new-media technologies to simultaneously create multi-layered datascares and intimate, culturally specific participatory situations.

Chair

Ian Gwilt

School of Design, University of Technology, Sydney
Sydney, Australia
iangwilt@bigpond.com

Panelists

Melinda Rackham

Australian Network for Art and Technology (ANAT)
Adelaide, Australia

Paul Vanouse

University of Buffalo, Carnegie Mellon University
New York, USA

Ernest Edmonds

University of Technology, Sydney
Sydney, Australia

Ted Selker

Massachusetts Institute of Technology Media
and Arts Technology Laboratory
Massachusetts, USA

Electronics and Art: More Than Meets the Eye

10:30 am - 12:15 pm

Art Sketches

Thermoesthesia

A new style of interactive artwork with an original thermal sense display that allows users to feel the temperature of visually displayed objects.

Kumiko Kushiya

PRESTO/JST
kushi@ea.mbn.or.jp

Momoko Inose

Rie Yokomatsu

Kinya Fujita

Tokyo University of Agriculture and Technology

Toshiie Kitazawa

Mototsugu Tamura

Shinji Sasada

Nippon Electronics College

Evolution of GORI.Node Garden

A novel approach to representing networks. This sketch presents project developments so far.

Jeon Hyun Oh

Ravensbourne College of Design and Communication
jee@gorigardeners.net

Slink

An experiment with matched mechanical, electrical, and visual resonances, using a spring and light. This is not a computer simulation; this is a physical, vibrating strobed spring.

Jeff Lieberman

Massachusetts Institute of Technology Media Lab
lieb@alum.mit.edu

The Wall Hanging: A Site-Sensitive Cloth

Woven on a traditional handloom, the interactive wall hanging features a dynamic LED array. When it is triggered by the viewer's position, the scrolling display presents narrative texts related to the exhibition location.

Barbara Layne

Hesam Khoshnevis
Concordia University
layne@alcor.concordia.ca

Creative Manipulation of Space, Time, and Image

3:45 - 5:30 pm

Art Sketches

Cybernetic Ceremony

This work is an experiment with Meta-Phorms. A Meta-Phorm (meta+metaphor+form) is intended to be the visual appearance/materialisation of an abstract creative proposition by setting geometrical forms into a game relationship.

Sherban Epuré

bles17@earthlink.net

Bringing the Virtual World into the Real World or Vice Versa

Input and output devices are essential to human interaction with a computer. But there is more to it than keyboard, mouse, and screen.

Christopher Bauder

w-h-i-t-e-v-o-i-d
info@electricmoons.com

From a Concept of Defamiliarization to Realization

An innovative approach to defamiliarization in which the confidante becomes alienated and can be perceived in a completely new way.

Florian Witzel

Fraunhofer Institut
fwitzel@web.de

Jury Artworks

Anne Behrnes

SIGGRAPH 2006 Art Gallery Administrative Assistant
Ohio, USA
abehrnes@gmail.com

Contemplations on Inner Space 4

Paul Brown

Fine Art Forum
SIGGRAPH 2006 Art Papers Chair
Cotton Tree, Australia
paul@paul-brown.com
4^16

Shawn Decker

School of the Art Institute of Chicago
Illinois, USA
sdecker@artic.edu
Green

Jorn Ebner

Independent Artist
Newcastle upon Tyne, United Kingdom
Collaborator: Oliver Böhm
j.ebner@britishlibrary.net
Leonardo Log

Paul Hertz

Northwestern University
Collaborators: Dan Zellner, Leif Krinkle
Illinois, USA
paul-hertz@northwestern.edu
Ignotus the Mage
Art Gallery Sketch: Ignotus the Mage

Kenneth A. Huff

Independent Artist
Florida, USA
ken@kennethahuff.com
Contemplations: 2005.2

Andrea Polli

Hunter College, Film and Media
Collaborators: Morgan Barnard, Markus Maurette
New York, USA
apolli@hunter.cuny.edu
Queensbridge Wind Power

Philip Sanders

The College of New Jersey
New York, USA
Collaborators: Rob LePlaca, Nick Sarnelli
ps@thing.net
Studio

LiQin Tan

Rutgers University
Research Assistants: Christopher Santoian, Justin Burton, Shaun Jennings
New Jersey, USA
ltan@camden.rutgers.edu
LavaBody + 6

Jana Whittington

Purdue University Calumet
Indiana, USA
whitting@calumet.purdue.edu
Exertions of Exodus

Wall-Hung 2D, 3D, and 4D Work

Joanna Berzowska

XS Labs

Collaborator: Christine Keller

Québec, Canada
joey@berzowska.com

Krakow: a woven story of memory and erasure

Alain Bittler

Independent Artist

Strasbourg-La-Robertsau, France
bittleralain@yahoo.com

Brush Traces I

bordomresearch

bordemresearch.com

Southampton, United Kingdom
siggraph@boredomresearch.net

biome

RandomSeed 001

Tim Borgmann

Independent Artist

Wuppertal, Germany
info@bt-3d.de

shape.69c

shape.53a#2

Brit Bunkley

Quay School of the Arts
Wanganui, New Zealand
brit@ihug.co.nz

Sheep Jet Head

Art Gallery Sketch: Virtual Public Art, Animation,
and Kosuth

Sheriann Ki Sun Burnham

Independent Artist

California, USA
kisun@earthlink.net

Tortuosity #59c

Terry Calen

Independent Artist

Washington, USA
trc@plazadelpixo.com

0512

Alessandro Capozzo and Katia Noppes

Independent Artists

Milano, Italy
alessandro@ghostagency.net
noppes@tiscali.it

Exuvia

Art Gallery Sketch: Making Exuvia: Mediar
Hybridization as a Method

Alexdrina Chong

Bowling Green State University
Ohio, USA

alexdrina@alexdrina.com

Axiomatic Wisdom

Sandra Crisp

Independent Artist

London, United Kingdom
mail@sandracrispart.com

Global Happenings Excel 23

Infoscan 4

Hans Dehlinger

Universität Kassel, Kunsthochschule

Kassel, Germany
dehling@uni-kassel.de

DSCN0779.1CC

Leah Dixon

Aeon Studio

New York, USA
leah@aeonstudio.net

TEMPLE: Time Tapestry

Scott Draves

SPOTWORKS

California, USA
siggraph@draves.org

Collaborators: The Electric Sheep

Dreams in High Fidelity

Art Gallery Sketch: Dreams in High Fidelity

Ed Eaton

Independent Artist

Alberta, Canada
eeaton@dirtr.net

Wall Sculpture with Postits

Sherban Epuré

Independent Artist

New York, USA
bles17@earthlink.net

Cybernetic Ceremony in Black Velvet

Art Gallery Sketch: Cybernetic Ceremony

Lisa Erdman

Florida Southern College

Florida, USA
erdman144@yahoo.com

Annual Checkup:

Pharmaceuticals for the 21st Century

Jesurex

Abstinen

Homotrol

Ethnixox

Patriotec

Art Gallery Sketch: Annual Checkup:

Pharmaceuticals for the 21st Century

Miguel Fiadante

Fiadante, LLC

New York, USA
fiadante@fiadante.com

Collaborators: Raffic Ahamed, Amy Allocco,

Siddharta Bannerjee, Swarnab Narayah Ray,
Jhula Dey

Dreams Stage 3- Procession

Greg Garvey

Quinnipiac University

Connecticut, USA
greg.garvey@quinnipiac.edu

Suprematist Composition V

Phillip George

Independent Artist

Sydney, Australia
phlig@netspace.net.au

mnemonicon 23

Murat Germen

Sabancı Üniversitesi

Istanbul, Turkey
muratgermen@sabanciuniv.edu

Reading the Space as an Entity

Art Gallery Sketch: Reading the Space as an Entity

Madge Gleeson

Western Washington University

Washington, USA
mgleeson@cc.wvu.edu

Rocking Circle C

Gene Greger

Invincible Muffin Productions

New York, USA
gene.greger@gmail.com

Psychopharmacology

Peter Hardie

Bournemouth University

Dorset, United Kingdom
peterh@bournemouth.ac.uk

UpDown Fall

David Hart

Independent Artist

Utah, USA
blot@dahart.com

Blot 2005/01/02/10

Blot 2005/11/14/368

Art Gallery Sketch: Toward Greater Artistic Control for
Interactive Evolution of Images & Animation

Jean-Pierre Hébert

Kavli Institute for Theoretical Physics

California, USA
hebert@kitp.ucsb.edu

Rosettes grises

Troy Innocent

Monash University

Caulfield East, Australia
Troy.Innocent@artdes.monash.edu.au

Scenes From Ludea

Toshihiro Kamei

Kyushu University

Hukuoka, Japan
honky-tonk-life@hotmail.co.jp

CODE_LINE_Blue

CODE_LINE_Red

CODE_LINE_Green

CODE_LINE_Yellow

Yoichihiro Kawaguchi

The University of Tokyo

yoichihiro@iui.u-tokyo.ac.jp

Collaborators: Ryuma Niiyama, Mariko Fujita,

Akihiko Miyadera, Masayuki Takagi

Tokyo, Japan

Gemotional Bumpy Screen

Davida Kidd

University College of the Fraser Valley

British Columbia, Canada
dkidd@shaw.ca

God Save Us From Intoxicating Glances

Wall-Hung 2D, 3D, and 4D Work

Hye Kyung Kim

Kyung Hee University
Seoul, South Korea
khkyung7@naver.com

Meditation

Art Gallery Sketch: Digital Abstract Images

Viktor Koen

Independent Artist
New York, USA
viktor@viktorkoen.com

Dark Peculiar Toy No.03

Dark Peculiar Toy No.04

Dark Peculiar Toy No.19

Dark Peculiar Toy No.21

Mark Koven

University of South Florida
Florida, USA
markkoven@sprintpcs.com

Female Gape #3

Dorothy Krause

Viewpoint Studio
Massachusetts, USA
DotKrause@DotKrause.com

Margoa

Village

Shawn Lawson

Rensselaer Polytechnic Institute
New York, USA
lawson2@rpi.edu

Ray Tracings of the In Between:

Living Space

Ray Tracings of the In Between:

Tractor Space

Art Gallery Sketch: Ray Tracings of the In Between

Barbara Layne

Sub Tela Studio, Hexagram
Concordia University
Québec, Canada
layne@alcor.concordia.ca

Untitled Wall Hanging

Art Gallery Sketch: The Wall Hanging:

A Site-Sensitive Cloth

Jeff Lieberman

Massachusetts Institute of Technology
Massachusetts, USA
lieb@alum.mit.edu

Slink

Art Gallery Sketch: Slink

Andy Lomas

Framestore CFC
London, United Kingdom
andylomas@yahoo.com

Aggregation 22

Santiago Lombeyda

California Institute of Technology
California, USA
slombey@caltech.edu

Emergence: Order

Dan Lu

Independent Artist
Indiana, USA
lu.160@osu.edu

Transition I

Transition III

Jessica Maloney

Ashland University
Ohio, USA
mjessica3@hotmail.com

Exponential Growth

Dennis H. Miller

Northeastern University
Massachusetts, USA
dhmiller@comcast.net

Introspection

Mark Millstein

University of Massachusetts Dartmouth
Massachusetts, USA
mmillstein@umassd.edu

Kite Form: Laminate

Kite Form: Chrome Bowl

Marte Newcombe

NASA
Collaborator: Greg Shirah
Virginia, USA
etramnew@yahoo.com

Soothsayers

Masashi Nishimura

Kyushu University, Genda Laboratory
Fukuoka, Japan
gentlemanatarms@msn.com

Thorn

Evolution

Cynthia Beth Rubin

C B Rubin Studio
Rhode Island School of Design
Connecticut, USA
Collaborators: Holly Rushmeier, Bing Wang,

Yale University

info@cbrubin.net

Sand and Grasses1

Ansen Seale

Seale Studios
Texas, USA
ansen@sealestudios.com

Unfolding no. 14

Art Gallery Sketch: Insectinsight: A View of Time

Nathan Selikoff

Digital Awakening Studios
Florida, USA
nselikoff@gmail.com

A Society of Stickpeople (captured, #31)

Art Gallery Sketch: Digital Chronophotography

Benedict Sheehan

Independent Artist
Brighton, United Kingdom
benedict@spore.co.uk

Magic Mirror

Vladimir Sierra

Independent Artist
California, USA
vladimir@thinkforward.org

Still Life #2

Art Gallery Sketch: Mosaics and Ukiyotiles

Saritdikhun Somasa

Bowling Green State University
Ohio, USA
saritdikhun@yahoo.com

Driven 05

Driven 06

Driven 07

Driven 08

Mark J. Stock

University of Michigan
Massachusetts, USA
mstock@umich.edu

Open House

Art Gallery Sketch: Fluid Simulation and Global
Illumination in Open House

Thomas Suter

Ohio University Southern
Ohio, USA
suter@ohio.edu

Imaginary Flight over Okinawa

Masakazu Takano

Independent Artist
Oamishirasato, Japan
masakazu_takano@yahoo.com

E-scape

Chao-Ming James Teng

Massachusetts Institute of Technology
Collaborator: Edward Shen
Massachusetts, USA
jteng@media.mit.edu

Your Memory, Connected.

Shall I Compare Thee to a Summer's Day

Art Gallery Sketch: Your Memory Connected

Anna Ursyn

University of Northern Colorado
Colorado, USA
ursyn@unco.edu

Rondo

Roman Verostko

Pathway Studio
Minnesota, USA
rv@verostko.com

The Rocktown Scrolls, Black Elk Speaks

Diane Vetere

Independent Artist
Ontario, Canada
ddv@ican.net

do you see what i see 15

Orit Zuckerman

Massachusetts Institute of Technology, Media Lab
Collaborators: Sajid Sadi, Pattie Maes
Massachusetts, USA

orit@media.mit.edu

Spotlight

Installation Art

Christopher Bauder

w-h-i-t-e-v-o-i-d

Collaborators: Till Beckmann, Holger Pecht, Miriam Schulze

Berlin, Germany
info@electricmoons.com

electric moOns

Art Gallery Sketch: Bringing the Virtual World Into the Real World or Vice Versa

Adam Brown & Andrew Fagg

The University of Oklahoma
Oklahoma, USA
awbrown@ou.edu

Bion

Art Gallery Sketch: Is it Alive? Sensor Networks and Art

Mark Cypher

Murdoch University
Perth, Australia
m.cypher@murdoch.edu.au

Biophilia

Art Gallery Sketch: Biophilia

Jefferson Y. Han

New York University
New York, USA
jhan@mrl.nyu.edu

Media Mirror

Yeoh Guan Hong

Hyperthesis Visual Lab & Wanganui School of Design

Collaborators: Lin Yaw Cheang, Liew San Yen

Wanganui, New Zealand
yeoh@hyperthesis.com

Shifting Nature

Sergi Jordà

Collaborators: Martin Kaltenbrunner, Günter Geiger, Marcos Aloriso

Universitat Pompeu Fabra
Barcelona, Spain

sergi.jorda@ua.upf.es

the reacTable*

Art Gallery Sketch: The reacTable*

Øyvind Kolås

Gjøvik University College
Gjøvik, Norway
pippin@gimp.org

Nå av da (Now by Then)

Kumiko Kushiyama

PRESTO/JST

Collaborators: Momoko Inose, Rie Yokomotsu,

Kinya Fujita, Toshiie Kitazawa, Mototsugu

Tamura, Shinji Sasada

Kamakura, Japan
kushi@ea.mbn.or.jp

Thermoesthesia

Art Gallery Sketch: Thermoesthesia

Jae Min Lee

The School of the Art Institute of Chicago

Illinois, USA
ijm4939@hotmail.com

Water Lights

Jee Hyun Oh

Ravensbourne College of Design and Communication

Collaborators: Allan Au, Erik Kearney

Kent, United Kingdom
jee@gorigardeners.net

GORI.Node Garden - Gardening Two

Art Gallery Sketch: Evolution of GORI.Node Garden

Fernando Orellana

Union College
New York, USA
orellana@gmail.com

8520 S.W. 27th pl. v.2

Art Gallery Sketch: [transmissions]

Mark Scheeff

Independent Artist
California, USA
mark@markscheeff.com

Want #1 (continuous)

Zack Booth Simpson

Mine-Control
Texas, USA
submissions@mine-control.com

Moderation

John Slepian

Wesleyan University
New York, USA
johnslep@earthlink.net

little_one

Daphna Talithman, Orna Portugaly, and Sharon Younger

Independent Artists
Tel Aviv, Israel
daphtal@yahoo.com

Heartbeats

Art Gallery Sketch: Interaction as the Means and as the Meaning

Interactive Monitor-Based Works

Juliet Davis

University of Tampa
Florida, USA
julietdavis@tampabay.rr.com

Altar-ations

fi5e

Independent Artist

Collaborators: HELL, JESUS SAVES, AVONE, and

KATSU

New York, USA
fi5e@ni9e.com

Graffiti Analysis

Sadam Fujioka and Osamu Sambuichi

Kyushu University
Fukuoka City, Japan
fuctracker@hotmail.com

Code

Art Gallery Sketch: Code

Martha Carrer Cruz Gabriel

Universidade de São Paulo
São Paulo, Brazil
martha@martha.com.br

Voice Mosaic

Art Gallery Sketch: Voice Mosaic

Michael Takeo Magruder

Independent Artist
Coventry, United Kingdom
m@takeo.org

Data_Cosm

Ricard Marxer Piñón

Independent Artist
Barcelona, Spain
email@ricardmarxer.com

Caligraft

Jody Zellen

Independent Artist
California, USA
jodyzel@aol.com

Talking Walls

inter

Sculpture

Ergun Akleman

Texas A&M University
Collaborator: Ozan Ozener
Texas, USA
ergun@viz.tamu.edu

Symmetric Sculptures

Art Gallery Sketch: Designing Symmetric
High-Genus Sculptures

Keith Brown

Manchester Metropolitan University
Manchester, United Kingdom
cyberform@ntlworld.com
Through

Gil Bruvel

Bruvel Studios
Texas, USA
bruvel@aol.com

Mask of Intent

Mask of Sleep

Mask of Whispers

Sachiko Kodama

The University of Electro-Communications
Collaborators: Makoto Tanabe, Satoru Saito, Kingo Arakawa
Tokyo, Japan
kodama@hc.uec.ac.jp
MorphoTower/Spiral Swirl

Patrick Lichty

Bowling Green State University
Ohio, USA
voyd@voyd.com
Pixelboxes

Carlo Séquin

University of California, Berkeley
California, USA
sequin@cs.berkeley.edu
Hilbert Cube
Art Gallery Sketch: Hilbert Cube

Animation

Bret Battey

Music, Technology and Innovation Research Centre,
De Montfort University
Leicester, United Kingdom
bret@bathatmedia.com

Autarkeia Aggregatum

Art Gallery Sketch: Autarkeia Aggregatum:
Autonomous Points, Emergent Textures

Stéphane Berla

LN Production
Composer: Jean-François Coen
Paris, France
cafe.bouillu@free.fr
Café Bouillu

Lucy Blackwell

Upsidedownit
Composer: David Agrell
New York, USA
lucy@upsidedownit.com
Alive

Joris Clerté & Philippe Massonnet

Doncvoilà
Music: Prudence
Paris, France
Virginie Giachino, info@doncvoila.net
À tort ou à raison

Jean Detheux

National Film Board of Canada
Composer: Jean Derome
Québec, Canada
Madeleine Belisle, festivals@nfb.ca
Rupture

Patrick Doan

Concordia University
Composer: Jeff McIlwain
Québec, Canada
info@defasten.com
TRANSREC

Chris Hinton

National Film Board of Canada
Composer: Michael Oesterle
Québec, Canada
Madeleine Belisle, festivals@nfb.ca
cNOTE

Teppei Kuroyanagi

Composer: Takahide Higuchi
Tokyo, Japan
info@nipppon.com
C++

Luis Nieto

ENSAD
Composer: Luis Nieto
Paris, France
Pierre Hénon
aui@ensad.fr
Oreille remplie de plumes

Grégoire Pierre

ENSAD
Composer: Nicolas Bridier
Paris, France
Pierre Hénon, aui@ensad.fr
Akkad

Dave Schwan

Ohio, USA
daveschwan@gmail.com
Violinist: Sean Hagerty
Time Away

sin sin

Amsterdam, The Netherlands
sinsin44@hotmail.com
Inside The Dishwasher

Florian Witzel, Magid Hoff, Stephan Betz

Fraunhofer Institut
Composer: Mike Paradinis
Griesbach, Germany
info@falofantioch.com

Fall of Antioch

Art Gallery Sketch: From a Concept of
Defamiliarization to Realization

Sil van der Woerd

Microbia
Composer: Tim Meijer
Arnhem, The Netherlands
silvanderwoerd@gmail.com
Swim

Art Gallery Screening Room

These animations will run continuously
throughout the conference during Art Gallery
hours.

Stephan Betz, Magid Hoff & Florian Witzel

Fall of Antioch 3:22

Sil van der Woerd

Swim 4:47

Patrick Doan

TRANSREC 4:25

Lucy Blackwell

Alive 3:00

Luis Nieto

Oreille remplie de plumes 2:32

sin sin

Inside the Dishwasher 2:47

Joris Clerte & Philippe Massonnet

A tort ou à raison 3:02

Stephane Berla

Café Bouilla 3:40

Teppei Kuroyanagi

C++ 8:50

Jean Detheux

Rupture 3:17

David Schwan

Time Away 2:56

Chris Hinton

cNote 6:45

Brett Battey

Autarkeia Aggregatum 9:30

Grégoire Pierre

Akkad 7:17

ject

Electronically Mediated Performances

Performance Schedule

Art Gallery Stage Hall B2

Sunday, 30 July

1:30 – 2:35 pm

Unheimlich

Telematic Theater Performance
Performance Sketch

3:30 – 5:30 pm

AUDIO BALLERINAS

Dance, Audio, Electronics Performance
Performance Sketch

Monday, 31 July

10 am – 12:15 pm

Unheimlich

Telematic Theater Performance

AUDIO BALLERINAS

Dance, Audio, Electronics Performance
Performance Sketch

Singularity

Flute/Computer Performance
Performance Sketch

4 – 5:30 pm

Mandala

Musical Improvisation with CG
Performance Sketch

AUDIO BALLERINAS

Dance, Audio, Electronics Performance

Tuesday, 1 August

10 am – 1:30 pm

HOEReographien

Interactive Dance Performance
Performance Sketch

Perceivable Bodies

Interactive Dance Performance
Performance Sketch

Abracadabra

Interactive Magic Performance
Performance Sketch

Gemon Dance

Interactive Dance Performance
Performance Sketch

2:30 – 5 pm

VJ Fleet [Redux]

Performance Sketch

spatial oscillator

Interactive Dance Performance
Performance Sketch

Collapse:Focus

Live Mediated Video and Sound

Performance Sketch

On-the-Fly Counterpoint

Real-Time Programming and Audio
Performance Sketch

Wednesday, 2 August

10 am – 1:35 pm

Eye of the Pilot

Live Music and Video
Performance Sketch

Jam'aa for Haile

Robotic Drum Performance
Performance Sketch

reactTable*

Interactive Audiovisual Tabletop Performance
Performance Sketch

2:30 – 4:30 pm

Gemon Dance

Interactive Dance Performance

Abracadabra

Interactive Magic Performance

Singularity

Flute/Computer Performance

Perceivable Bodies

Interactive Dance Performance

Off-stage performance presentations

4:30 – 5:30 pm

Light Attack

unspoken_boston_siggraph

Thursday, 3 August

10 am – 1 pm

spatial oscillator

Interactive Dance Performance

On-the-fly Counterpoint

Real-Time Programming and Audio

Collapse:Focus

Live Mediated Video and Sound

reactTable*

Interactive Audiovisual Tabletop Performance

2 – 4:15 pm

HOEReographien

Interactive Dance Performance

Eye of the Pilot

Live Music and Video

Jam'aa for Haile

Robotic Drum Performance

Performances

Addictive TV

United Kingdom

Performers: Peter John Limbrey, Alejandro De Valera, Graham Esmond Daniels, Françoise Lamy

francoise@addictive.com

The Eye of the Pilot

Julie Andreyev

Emily Carr Institute of Art and Design

British Columbia, Canada

Collaborators: Sean Arden, Simon Overstall, Jordan Benwick, Hyuma Frankowski, Sandra Hanson

julie@fourwheeldrift.com

VJ Fleet [Redux]

Mark Ballora

Pennsylvania State University

USA

Collaborator: Agatha Jui-Chih Wang, flutist ballora@psu.edu

Singularity

Yoichiro Kawaguchi

The University of Tokyo

Japan

Collaborators: Masayuki Takagi, Tomohiro Akagawa, Shuhei Tsuruoka

Dancer: Alissa Cardone

yoichiro@iii.u-tokyo.ac.jp

Gemon Dance

J.U. Lensing, THEATER DER KLÄNGE

Germany

Director: J.U.Lensing

Music: Thomas Neuhaus

Light: Christian Schroeder

Video programming: Lucy Lungley

Choreographer: Jacqueline Fischer

Dancers: Jenny Ecke, Jelena Ivanovic,

Caitlin Smith, Hana Zanin

info@theater-der-klaenge.de

HOEReographien

Benoit Maubrey

Germany

Performer: Anna Whaley

maubrey@snafu.de

AUDIO BALLERINAS

Jun Oh and Min Jeong Kang

New York University

USA

Collaborator: Christian Croft

junisjun@gmail.com

Abracadabra

Palindrome

Germany

Performer: Emily Fernandez

Collaborator: Dan Hosken

frieder@palindrome.de

Perceivable Bodies

Joe Reinse

University of Maryland, Baltimore County
USA
jreinse@umbc.edu
Collapse: Focus

Daniel Sauter

University of Illinois at Chicago Illinois,
USA
contact@daniel-sauter.com
Projected Character: Earl Minor
Light Attack

Hyjung Seo and Seunghye Kim

SADI
South Korea
seo.hyojung@gmail.com
spatial oscillator

Paul Sermon

The University of Salford

Steve Dixon

Brunel University

Mathias Fuchs

The University of Salford

Andrea Zapp

The Manchester Metropolitan University
United Kingdom
p.sermon@salford.ac.uk
Unheimlich

Hoyun Son

The School of the Art Institute of Chicago
USA
hoyunson@gmail.com
Unspoken_Series

Benjamin Vigoda

Mitsubishi Electric Research Laboratories (MERL)
USA
Performers: David Merrill, Shawn Hershey,
Erik Nugent
vigoda@merl.com
MANDALA

Ge Wang and Perry R. Cook

Princeton University
USA
gewang@cs.princeton.edu
On-the-Fly Counterpoint

Gil Weinberg

Georgia Institute of Technology
USA

Collaborators: Scott Driscoll, Travis Thatcher
gil.weinberg@coa.gatech.edu

Jam'aa for Haile

Location

Art Gallery: Hall B1

Days & Hours

Sunday, 30 July	1 – 6 pm
Monday, 31 July	9 am – 6 pm
Tuesday, 1 August	9 am – 6 pm
Wednesday, 2 August	9 am – 6 pm
Thursday, 3 August	9 am – 5 pm

Charles A. Csuri: Beyond Boundaries 1963 – present

Explore this extensive retrospective exhibition featuring a documentary on Csuri's life and over 70 works by the artist, including his first plotter drawing, real-time animations, newly rediscovered works from the early period, recent examples from the Infinity Series, and more. Csuri is recognized as "the father of digital art and computer animation" by Smithsonian Magazine, and as a leading pioneer of computer animation by the Museum of Modern Art, NY.

Beyond Boundaries Committee

Charles A. Csuri

Contributing Artist
The Ohio State University

Janice M. Glowski

Exhibition Curator
The Ohio State University

Maria Palazzi

Donations and Liason
The Ohio State University

Keith Kelley

Historical and Recent Animation Production
The Ohio State University

Eva Dujardin Dale

Catalog Design
The Ohio State University

Exhibition Features

Early Period

(1963 – mid-1970s)

After Albrecht Dürer, 1964
After Paul Cézanne, 1964
Pages from the Artist's Sketchbook, 1965 – 66
Sine Curve Man, 1967
Random War, 1967 (recreated 2006)
Sinescape, 1967
Hummingbird, the animation, 1967
Numeric Milling, 1968
Historical Image Slide Show

Middle Period

(late 1980s – early 1990s)

Silent Statues, 1989
A Child's Face, 1989
Faces, 1989
Mask of Fear, 1989
Gossip, 1990
Golden Mask, 1995

Later and Recent Periods

(mid-1990s – 2006)

A Happy Time, 1996
Horse Play, 1999
Raphael Voglass, 2000
Balancing Act, 2000
Strawscape, 2002
Entanglement, 2002
Festive Frame 47 (leo series), 2006
Recent Animations, 2006

Special Events

Sunday, 30 July

3 – 5:30 pm

Ohio State Alumni Reception

Art Gallery, Hall B1

Tuesday, 1 August

10:30 am – 12:15 pm

Beyond Brush and Easel Art panel

Room 207

2 – 3 pm

**Exhibition catalogue signing,
with Charles A. Csuri**

ACM SIGGRAPH Bookstore
Hall B Lobby

Locations

Electronic Theater: Grand Ballroom
Electronic Theater Matinée: Grand Ballroom
Animation Theater: Rooms 104 and 107

Days & Hours

See Below

Computer Animation Festival

This internationally recognized event engages and inspires artists and technologists alike. Each year, it serves as a mirror of what is possible today and a window into what can be achieved in the future.

The Computer Animation Festival presents selected works in the Electronic Theater (matinée and evening shows) and the Animation Theaters (throughout the week).

Electronic Theater

Location	Grand Ballroom
Monday, 31 July	7 – 9 pm
Tuesday, 1 August	7 – 9 pm
Wednesday, 2 August	7 – 9 pm

Electronic Theater Matinée

Location	Grand Ballroom
Tuesday, 1 August	1:30 – 3:30 pm
Wednesday, 2 August	1:30 – 3:30 pm

Animation Theaters

Location	Room 104 and 107
Sunday, 30 July	1 – 6 pm
Monday, 31 July	9 am – 6 pm
Tuesday, 1 August	9 am – 6 pm
Wednesday, 2 August	9 am – 6 pm
Thursday, 3 August	9 am – 5 pm

Computer Animation Festival's Peoples' Choice Awards

The second annual Computer Animation Festival's Peoples' Choice Awards: Log in and vote for your favorite animation from this year's Electronic Theater and Animation Theaters!

Go to: <http://siggraph.org/s2006/cafsurvey/>

Computer Animation Festival Committee

Terrence Masson
Computer Animation Festival Chair
Digital Fauxtography Inc.

Dana Boadway
Assistant Producer
Killerjellybean Animation

Ryan Kuba
Production Lead
Technicolor Creative Services

Klaus Steden
Technology Lead
Technicolor Creative Services

Brian Reid
Post Lead
Technicolor Creative Services

Samuel Lord Black
Database Coordinator
Autodesk, Inc.

Computer Animation Festival Jury

Larry Cuba
Iota Center

Thomas Haegele
Filmakademie Baden-Württemberg

Jodie Jenkinson
University of Toronto

Ed Kramer
Industrial Light & Magic

Dan Krech
DKP Studios

Bill Polson
Pixar Animation Studios

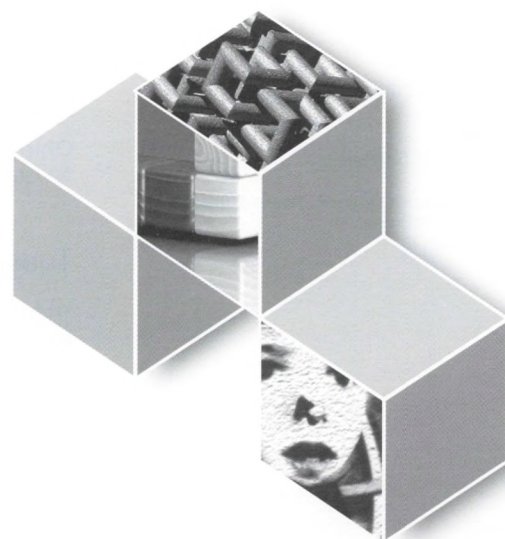
Glenn Robbins
Newtonic

Moto Sakakibara
Sprite Animation Studios

Computer Animation Festival Jury Alternates

Bonnie Mitchell
SIGGRAPH 2006 Art Gallery Chair
Bowling Green State University

Paul Debevec
**SIGGRAPH 2007 Computer Animation
Festival Chair**
University of Southern California Centers for
Creative Technologies



Computer Animation Festival Sketches

Monday, 31 July

3 - 4 pm
Room 107

The Making of "One Rat Short"

(Best of Show)

Director Talk: Using visual analogies between "One Rat Short" and other movies, especially 1940s and 1950s film noir, this talk summarizes the production techniques in this year's Best of Show work in the Computer Animation Festival.

Alex Weil
Charlex, Inc.

Tuesday, 1 August

3 - 4 pm
Room 107

The Making of "458nm"

(Special Jury Honors)

Tech Talk: Summary of the concept, design, rigging and animation, pipeline, rendering and compositing, and music and editing required to produce "458nm."

Jan Bitzer
Ilija Brunck
Tom Weber
Filmakademie Baden-Württemberg
jan.bitzer@filmakademie.de

Wednesday, 2 August

3 - 4 pm
Room 107

rats ad infinitum

(Special Jury Honors)

Tech Talk: For "One Rat Short," Charlex rendered thousands of furry rats with off-the-shelf Maya and mental ray tools.

Seth Lippman
Karl Coyner
Charlex, Inc.
slippman@charlex.com

Electronic Theater Pre-Show: World's Biggest Etch A Sketch

Officially endorsed by the Ohio Art Company and a possible Guinness World Records entry, the Electronic Theater pre-show will allow the audience to control the two famous Etch A Sketch knobs in real-time and draw interactively on the main projection screen. Each audience member will use a two-sided "wand" to signal a preference to the sensor cameras. One configuration will allow the left half of the audience to turn the left knob. The other will allow the right half of the audience to turn the right knob. The two halves will attempt to "group think" and trace various graphics on the giant screen by collectively turning the knobs and "shaking" the screen clean. The pace will pick up quickly as new, fast, and funny tasks flash before the audience.

The World's Biggest Etch A Sketch is an original concept by SIGGRAPH 2006 Computer Animation Festival Chair Terrence Masson. Patented interactive technology and game design provided by Cinematrix Interactive Entertainment Systems. For more information on Cinematrix visit: www.cinematrix.com.

The Etch A Sketch product name and the configuration of the Etch A Sketch product are registered trademarks owned by the The Ohio Art Company.

Special Screenings

The Dream Machine

David Sieg
Sunday, 30 July, 5 – 6 pm
Room 107

There was a time when the thought of using a computer to make graphics move was revolutionary. For almost a decade, eight analog computers produced nearly all of the electronic animation seen on television.

This is the story of the pioneers who invented and programmed these Scanimate computers and created what has become a multi-billion-dollar industry. For more information on Scanimate visit: www.scanimate.net.

Japan Media Arts Festival:
Entertainment Division/
Visual Image
Sunday, 30 July, 1 – 1:30 pm
Room 107

Japan Media Arts Festival:
Animation Division/Animation
Sunday, 30 July, 3 – 3:30 pm
Room 107

Japan Media Arts Festival:
Art Division/Visual Image
Sunday, 30 July, 4:30 – 5 pm
Room 107

Animation Theaters Schedule

Special Screenings

		SUN, 30 JULY	MON, 31 JULY	TUES, 1 AUG	WED, 2 AUG	THU, 3 AUG
SS 1	The Dream Machine (Scanimate) RT 1:01:30	9 – 9:30 am Room 107	AT 2	AT 2	AT 2	AT 2
		Room 104	AT 1	AT 1	AT 1	AT 1
	9:30 – 10 am	Room 107	AT 3	AT 3	AT 3	AT 3
		Room 104	AT 2	AT 2	AT 2	AT 2
SS 2	Japan Media Arts Festival: Entertainment Division/Visual Image RT 25:00	10 – 10:30 am Room 107	AT 4	AT 4	AT 4	AT 4
		Room 104	AT 3	AT 3	AT 3	AT 3
	10:30 – 11 am	Room 107	AT 5	AT 5	AT 5	AT 5
		Room 104	AT 4	AT 4	AT 4	AT 4
SS 3	Japan Media Arts Festival: Animation Division/Animation RT 25:00	11 – 11:30 am Room 107	AT 6	AT 6	AT 6	AT 6
		Room 104	AT 5	AT 5	AT 5	AT 5
SS 4	Japan Media Arts Festival: Art Division/Visual Image RT 25:00	11:30 am – noon Room 107	AT 7	AT 7	AT 7	AT 7
		Room 104	AT 6	AT 6	AT 6	AT 6
	noon – 12:30 pm	Room 107	AT 1	AT 1	AT 1	AT 1
		Room 104	AT 7	AT 7	AT 7	AT 7
	12:30 – 1 pm	Room 107	AT 2	AT 2	AT 2	AT 2
		Room 104	AT 1	AT 1	AT 1	AT 1

Sketches

- SK 1** The Making of “One Rat Short”
RT 01:00:00
- SK 2** The Making of “458nm”
RT 01:00:00
- SK 3** rats ad infinitum RT 01:00:00

1 – 1:30 pm	Room 107	SS 2	AT 3	AT 3	AT 3	AT 3
	Room 104	AT 1	AT 2	AT 2	AT 2	AT 2
1:30 – 2 pm	Room 107	AT 2	AT 4	AT 4	AT 4	AT 4
	Room 104	AT 2	AT 3	AT 3	AT 3	AT 3
2 – 2:30 pm	Room 107	AT 3	AT 5	AT 5	AT 5	AT 5
	Room 104	AT 3	AT 4	AT 4	AT 4	AT 4
2:30 – 3 pm	Room 107	AT 4	AT 6	AT 6	AT 6	AT 6
	Room 104	AT 4	AT 5	AT 5	AT 5	AT 5
3 – 3:30 pm	Room 107	SS 3	SK 1	SK 2	SK 3	AT 7
	Room 104	AT 5	AT 6	AT 6	AT 6	AT 6
3:30 – 4 pm	Room 107	AT 5	SK 1 (cont.)	SK 2 (cont.)	SK 3 (cont.)	AT 7
	Room 104	AT 6	AT 7	AT 7	AT 7	AT 7
4 – 4:30 pm	Room 107	AT 6	AT 7	AT 7	AT 7	AT 2
	Room 104	AT 7	AT 1	AT 1	AT 1	AT 1
4:30 – 5 pm	Room 107	SS 4	AT 1	AT 1	AT 1	AT 3
	Room 104	AT 1	AT 2	AT 2	AT 2	AT 2
5 – 5:30 pm	Room 107	SS 1	AT 2	AT 2	AT 2	AT 2
	Room 104	AT 2	AT 3	AT 3	AT 3	AT 3
5:30 – 6 pm	Room 107	SS 1 (cont.)	AT 3	AT 3	AT 3	AT 3
	Room 104	AT 3	AT 4	AT 4	AT 4	AT 4

Animation Theaters

AT Reel 1 24:58
kuhfo Interstitial 1 – aufblasen
The MagicBox
Delivery
Quest for the Mystic Moogoo Fruit!
Flight Patterns
Box
Good is Good
Race Cornetto Aphrodisiac
CAPs

AT Reel 2 25:44
Reflect
ToyArtist:papa&baby
Oh Hisse
Fluid Animation With Dynamic Meshes
Rama
Kungfu Gecko

AT Reel 3 25:41
kuhfo Interstitial 2 – disco
PetShop
calidri
Planet One Barbeque
Solomon Grundy
Snakes
In Search of the Puppeteer
Gnap Gnap
At The End Of The String
Fertilizer Soup
3D Illusion in Motion

AT Reel 4 25:10
kuhfo Interstitial 3 – einsaugen
Open Book
The Aeronaut
Final Fantasy VII Advent Children
scope
Growth by Aggregation
Musashino Plateau
Hitchhiker's Guide to The Galaxy
Beloved
Theros

AT Reel 5 25:07
kuhfo Interstitial 4 – huepfen
Robin Hood Flour – Memories
GEZ “The Black Sheep”
Sharing Bears
Relighting Human Locomotion
Sciatica
Future Sky
Multi-Layered Cloth Simulation
Fog (Niebla)
Treibgut
Northwest Airlines Transformations

AT Reel 6 25:24
kuhfo Interstitial 5 – lovestory
Memorial
Aal im Schädel
Walking With Monsters
K liquid
The Fly
Real Birds Don't Barf
Suba
Motorola “Peb!”

AT Reel 7 25:27
kuhfo Interstitial 6 – rieseneuter
VW Golf GTI – Singing in the Rain
Harry Potter and the Goblet of Fire
Do Robots Dream of Bunnies?
Color Dream No. 246
Multi-Touch Interaction Research
Johnnie Walker “Paintings”
Moongirl
Gatorade “Shattered”

Animation Theaters

3D Illusion in Motion

Singapore
Director: Yee Siong Leow
SIGGRAPH Singapore
ysleow38@singnet.com.sg

Aal im Schädel

Germany
Director: Martin Rahmlow
Filmakademie Baden-Württemberg
animationsinstitut@filmakademie.de

The Aeronaut

USA
Director: Nicholas Lombardo
Ringling School of Art and Design
nlombard@ringling.edu

At The End Of The String

France
Director: Amandine Pecharman
Gobelins, l'école de l'image
Contact: Christine Perrin
cperrin@gobelins.fr

Beloved

United Kingdom
Director: Alex Wilkie
National Centre for Computer Animation
Contact: Anargyros Sarafopoulos
asarafo@bournemouth.ac.uk

Box

Canada
Director: Stephen Crowhurst
NAKD
Contact: Samantha Ferguson
samf@theebelingroup.com

Calidri

USA
Director: Brian Evans
University of Alabama
brian.evans@ua.edu
Sketch: Musical Connections and
Heterophonic Maps, page 70

CAPs

Germany
Directors: Moritz Mayerhofer, Jan Locher
Filmakademie Baden-Württemberg
animationsinstitut@filmakademie.de

Color Dream No. 246

USA
Director: Michael Theodore
University of Colorado
michael.theodore@colorado.edu

Delivery

Germany
Director: Till Nowak
frameboX
till.nowak@framebox.de

Do Robots Dream of Bunnies?

USA
Director: Piotr Karwas
Digital Domain Inc.
Contact: Ed Ulbrich
eulbrich@d2.com

Fertilizer Soup

France
Director: Sylvain Marc
Gobelins, l'Ecole de l'Image
Contact: Christine Perrin
cperrin@gobelins.fr

Final Fantasy VII Advent Children

Japan
Director: Tetsuya Nomura
Square Enix Co., Ltd.
Contact: Makiko Noda
mnoda@square-enix.co.jp

Flight Patterns

USA
Director: Aaron Koblin
University of California, Los Angeles Design|Media Arts
akoblin@ucla.edu

Fluid Animation With Dynamic Meshes

USA
Director: Bryan Klingner
University of California, Berkeley
klingner@cs.berkeley.edu

The Fly

USA
Director: HanJin Song
Contact: PJ Park (HanJin Song)
Ringling School of Art and Design
hsong@rsad.edu

Fog (Niebla)

Spain
Director: Emilio Ramos
Universitat Pompeu Fabra
Contact: Santi Fort
santi.fort@upf.edu

Future Sky

Canada
Director: John Dubinski
University of Toronto
dubinski@astro.utoronto.ca

Gatorade "Shattered"

USA
Director: Brian Beletic
Digital Domain, Inc.
Contact: Ed Ulbrich
eulbrich@d2.com

GEZ "The Black Sheep"

Germany
Director: Peter Spans
Spans & Partner GmbH
Contact: Jeannine Fohrmann
jeannine.f@spans.de

Gnap Gnap

France
Directors: Olivier Daube, Sonia DesMichelis, Wilfried Pain, Bertrand Piocelle Jean-Vincent Sales
Gobelins, l'Ecole de l'Image
Contact: Christine Perrin
cperrin@gobelins.fr

Good is Good

USA
Directors: Todd Mueller, Kylie Matulick
PSYOP, Inc
Contact: Jennifer Treuting
jennifer@psyop.tv

Growth by Aggregation

USA
Director: Andy Lomas
andylomas@yahoo.com

Harry Potter and the Goblet of Fire

United Kingdom
Director: Mike Newell
Framestore CFC
Contact: Stephanie Bruning
steph.bruning@framestore-cfc.com

Hitchhiker's Guide to The Galaxy

United Kingdom
Director: Garth Jennings
Cinesite
Contact: Helen Arnold
helen@cinesite.co.uk

In Search of the Puppeteer

USA
Director: Chih-Ming Chang
California Institute of the Arts
emailchihming@gmail.com

Johnnie Walker "Paintings"

United Kingdom
Directors: Bobby Proctor and Pat Gavin
Aardman Animation Ltd.
Contact: Mandi Stark
mandi.stark@aardman.com

K liquid

Belgium
Director: Rizon Parein
info@rizon.be

Kuhfo

Germany
Director: Hannes Appell, Holger Wenzl
Contact: Institute of Animation, Visual Effects and Digital Postproduction
animationinstitut@filmakademie.de

Kungfu Gecko

Singapore
Director: Nickson Fong
Egg Story Creative Production
Contact: Elizabeth Wong
info@eggstorycp.com

The MagicBox

Germany
Director: Alexander Beim
alex@lotusart.de

Memorial

USA
Directors: Matt Clausen, Jon Gutman
University of Southern California
info@memorialthefilm.com

Animation Theaters

Moongirl

USA

Director: Henry Selick
Contact: Helen Kalafatic

iasak_us@laika.com

Motorola "Peb!"

USA

Director: David Fincher
Digital Domain, Inc.

Contact: Ed Ulbrich
eulbrich@d2.com

Multi-Layered Cloth Simulation

USA

Director: Anthony LaMolina
Walt Disney Animation

Contact: Dayna Meltzer
dayna.meltzer@disney.com

Multi-Touch Interaction Research

USA

Director: Jefferson Y. Han
New York University
Courant Institute of Mathematical Sciences
jhan@mtl.nyu.edu

Musashino Plateau

Japan

Director: Nobuo Takahashi
Nagoya City University/Yoshida Gakuen
ybbnt@yahoo.co.jp

Northwest Airlines Transformations

USA

Director: Arman Matin
rhinofx

Contact: Lisa Starace
lisas@rhinofx.tv

Oh Hisse

Japan

Director: Hikaru Yamakawa
Tohoku University of Art and Design
y-hikaru@mvc.biglobe.ne.jp

Open Book

France

Directors: Iris Bonavitacola, Virginie Hanrigou, Raphaël Lev, Carole Maurel, Augustin Paliard
Gobelins, l'Ecole de l'Image

Contact: Christine Perrin
cperrin@gobelins.fr

PetShop

USA

Director: Trenton Halvorsen
Brigham Young University

Contact: R. Brent Adams
adamsb@byu.edu

Planet One Barbeque

Spain

Director: Jorge Blanco
Ilion animation studios S.L.
Contact: Alex Baixas
alexandro.baixas@ilion.com

Quest for the Mystic Moogoo Fruit!

Iran

Director: Ila Soleimani
ila_solomon@yahoo.com

Race Cornetto Aphrodiziac

México

Director: Javier Gutiérrez
Ciberfilms SC
contacto@ciberfilms.com

Rama

France

Director: Eric Bruneton
ebruneton@free.fr

Real Birds Don't Barf

Germany

Director: Bernhard Haux
Institute of Animation, Visual Effects and Digital Postproduction
animationsinstitut@filmakademie.de

Reflect

USA

Director: Dennis H. Miller
Northeastern University
dhmiller@comcast.net

Relighting Human Locomotion

USA

Director: Paul Debevec
University of Southern California Centers for Creative Technologies
debevec@ict.usc.edu

Robin Hood Flour - Memories

Canada

Director: Richard Rosenman
Red Rover Studios
Contact: Raph Quirino
raph@redrover.net

Sciatica

United Kingdom

Director: Peter Nancolis
National Centre for Computer Animation
Contact: Anargyros Sarafopoulos
asarafop@bournemouth.ac.uk

Scope

Japan

Director: Makoto Yabuki
TANGRAM Co. Ltd.
yabu@tangram.to

Sharing Bears

USA

Director: Steven Ford
Center for Digital Imaging Arts, Boston University
stford1@gmail.com

Snakes

Spain

Director: Cristóbal Vila
cristobal@etereaestudios.com

Solomon Grundy

USA

Directors: Ken Seward, Chris Myers
Savannah College of Art and Design
chris@chrismyers3d.com

Suba

United Kingdom

Director: Alastair Graham
Jellyfish Pictures
Contact: William Rockall
will@jellyfishpictures.co.uk

Theros

United Kingdom

Director: Georgios Cherouvim
National Centre for Computer Animation
Contact: Anargyros Sarafopoulos
asarafop@bournemouth.ac.uk

ToyArtist:papa&baby

South Korea

Directors: Wooksang Chang, Jaemin Lee, Younghee Choi, Donghyuk Choi, Chigon Park, Hyejin Kim
wooksang_chang@hotmail.com

Treibgut

United Kingdom

Director: Ruediger Kaltenhaeuser
animationsinstitut@filmakademie.de

VW Golf GTI – Singing in the Rain

United Kingdom

Director: N-EO
The Moving Picture Company
Contact: Sophie Trainor
sophie-t@moving-picture.com

Walking With Monsters

United Kingdom

Directors: Chloe Leland, Tim Haines
Framestore CFC
Contact: Stephanie Bruning
steph.bruning@framestore-cfc.com

inter

Electronic Theater

458nm (Special Jury Honors)
Germany

Directors: Jan Bitzer, Ilija Brunck, Tom Weber

Filmakademie Baden-Württemberg
animationsinstitut@filmakademie.de

Sketch: The Making of "458nm", page 105

A Great Big Robot From Outer Space Ate
My Homework

Canada

Director: Mark Shirra

Vancouver Film School

Contact: Susan Postma

susanp@vfs.com

Brush

United Kingdom

Director: Lei Chen

Bournemouth University

Contact: Victoria Caution

vcapution@bournemouth.ac.uk

Bubble Girl

USA

Directors: Marie Hyon, Marco Spier

PSYOP, Inc.

Contact: Jennifer Treuting

jennifer@psyop.tv

The Building

France

Directors: Marco Nguyen, Pierre Perifel, Xavier

Ramonede, Olivier Staphylas, Rémi Zaarour

Gobelins L'Ecole de L'Image

Contact: Christine Perrin

cperrin@gobelins.fr

Carlitopolis

France

Director: Luis Nieto

ENSAD

Contact: Pierre Henon

aui@ensad.fr

Dairy Crest "Cityside"

United Kingdom

Director: Dom & Nic

(Outsider Films)

Framestore CFC

Contact: Stephanie Bruning

steph.bruning@framestore-cfc.com

Discord: metal and meat

USA

Director: Stephan Larson

Northern Michigan University

stlarson@nmu.edu

Doll Face

USA

Director: Andrew Huang

andrewhu@usc.edu

"Everyone's Hero"

USA

Directors: Daniel St. Pierre, Colin Brady

IDT Entertainment

Contact: Frank Gladstone

frank.gladstone@idte.net

Flow

Germany

Director: Stephan Trojansky

Scanline Production

Contact: Danielle Plantec

dip@scanline.de

Foster's Australia "Big Ad"

Australia

Director: Paul Middleditch

Animal Logic

Contact: Anna Hildebrandt

annac@al.com.au

Growth by Aggregation 2

(the Utah variation)

USA

Director: Andy Lomas

andylomas@yahoo.com

Guinness "noitulovE"

United Kingdom

Director: Daniel Kleinman

(Kleinman Productions)

Framestore CFC

Contact: Stephanie Bruning

steph.bruning@framestore-cfc.com

ILM 2006

USA

Director: Brent Bowers

Industrial Light & Magic

Contact: Kate Shaw

kateshaw@ilm.com

The Inner Life of the Cell (excerpt)

USA

Director: John Liebler

XVIVO LLC

Contact: Mary Ellen Graham

meg@xvivo.net

Insanely Twisted Shadow Puppets –
12 Interstitials

USA

Director: Michel Gagné

Gagne International Inc. LLC, Viacom Inc.

gagneint@aol.com

Into Pieces

Brazil

Director: Guilherme Marcondes

info@guilherme.tv

King Kong

New Zealand

Director: Joe Letteri

Weta Digital Ltd

Contact: Eileen Moran

em@wetafx.co.nz

King Kong: "In a New York Minute"

New Zealand

Directors: R. Christopher White, Keith F. Miller

Weta Digital Ltd.

cwhite@wetafx.co.nz

Sketch: "King Kong" - The Building of 1933

New York City, page 62

Monster Farm 5 Circus Caravan

Japan

Director: Goh Fujita

Digital Media Lab. Inc.

Contact: Junko Kawashima

bri@dmli.co.jp

Monster House: There Goes the
Neighborhood

USA

Director: Jay Redd

Sony Pictures Imageworks

Contact: Jerome Schmitz

jschmitz@spanimation.com

Monster Samurai

USA

Director: Moto Sakakibara

Sprite Animation Studios

Contact: Grace McNamee

grace@spritee.com

My Date From Hell

Germany

Directors: Tim Weimann, Tom Bracht

Institute of Animation, Visual Effects and Digital Postproduction

animationsinstitut@filmakademie.de

Noggin

USA

Director: Alex Cannon

Brigham Young University

Contact: R. Brent Adams

adamsb@byu.edu

mixture

Electronic Theater

One Man Band

USA

Directors: Mark Andrews, Andrew Jimenez
Pixar Animation Studios

Contact: Steven Argula
sargula@pixar.com

One Rat Short (Best of Show)

USA

Director: Alex Weil

Charlex

Contact: Bryan Godwin

bryan@charlex.com

Sketch: The Making of "One Rat Short", page 105

"Open Season": Separating the Trees From the Forest

USA

Directors: Jill Culton, Roger Allers

Sony Pictures Imageworks

Contact: Jerome Schmitz

jschmitz@spanimation.com

Racing Beats

Germany

Directors: Alexander Kiesel, Steffen Hacker

Institute of Animation, Visual Effects and Digital Postproduction
animationsinstitut@filmakademie.de

Rexona "Go Wild"

United Kingdom

Director: Noam Murro

(Biscuit Filmworks)

Framestore CFC

Contact: Stephanie Bruning

steph.bruning@framestore-cfc.com

Robin Hood Flour - Giving

Canada

Director: Richard Rosenman

Red Rover Studios

Contact: Raph Quirino

raph@redrover.net

Toohey's "War of the Appliances"

Australia

Director: Graeme Burfoot

Animal Logic

Contact: Anna Hildebrandt

annac@al.com.au

Toyota "Meteor"

USA

Director: Baker Smith

Method

Contact: Mary Ann Cabrera

maryann@methodstudios.com

Tread Softly

USA

Director: Heebok Lee

Carnegie Mellon University

garin2@hotmail.com

Vodafone "Mayfly"

United Kingdom

Directors: Darren Walsh, Peter Thwaites

Passion Pictures

Contact: Joanna Stevens

joanna@passion-pictures.com

Warhammer: Mark of Chaos Intro Cinematic

Hungary

Director: Istvan Zorkoczy

Digic Pictures

Contact: Gabor Marinov

gabor.marinov@digicpictures.com

Wojna

Germany

Director: Agnieszka Kruczek

Institute of Animation, Visual Effects and Digital Postproduction

animationsinstitut@filmakademie.de

Emerging Technologies

interact with the interplay between humans and digital systems. Emerging Technologies demonstrates the future of interactive techniques in scientific visualization, robotics, medicine, biotechnology, music, audio, entertainment, fountains, services for the disabled, graphics, displays, haptics, sensors, gaming, the web, artificial intelligence, visualization, collaborative environments, design, aerospace, the military, and the fusion of technology and art.

Emerging Technologies Jury

Tom Craven
Emerging Technologies Chair
The Walt Disney Company (retired)

Don Dorsey
Innovation Properties, LLC

Andy Schwalb
Walt Disney parks & Resorts

Paul H. Dietz
Mitsubishi Electric Research Laboratory

Bonne Mitchell
SIGGRAPH 2006 Art Gallery Chair
Bowling Green State University

Bill Tomlinson
University of California, Irvine

Kathy Ryall
SIGGRAPH 2007 Emerging Technologies Co-Chair
Mitsubishi Electric Research Laboratories (MERL)

Steven Bathiche
Microsoft Corporation

John Sibert
SIGGRAPH 2007 Emerging Technologies Co-Chair
The George Washington University

Rob Grossman
Walt Disney Parks & Resorts

Emerging Technologies Sub-Committee

Angela Anderson
Emerging Technologies Administrative Assistant
Talley Management Group, Inc.

Preston J. Smith
Emerging Technologies Installation Coordinator
Electronic Data Systems Corporation

Manabu Sakurai
Emerging Technologies Interpreter
NTT Advanced Technology Corporation

Multilingual Tours

To join a tour of the Art Gallery and Emerging Technologies in your language, please meet five minutes before the tour begins at the Art Gallery entrance in Hall B1. Spaces are limited and are available on a first-come, first-served basis.

Monday, 31 July

9 – 9:45 am	Chinese: Mandarin
10 – 10:45 am	Japanese
11 – 11:45 am	Korean

Tuesday, 1 August

9 – 9:45 am	German
10 – 10:45 am	French
11 – 11:45 am	Spanish
2 – 2:45 pm	Japanese
3 – 3:45 pm	Korean
4 – 4:45 pm	Chinese: Mandarin

Wednesday, 2 August

10 – 10:45 am	Spanish
11 – 11:45 am	Chinese: Mandarin
noon – 12:45 pm	Korean
2 – 2:45 pm	Japanese
3 – 3:45 pm	French
4 – 4:45 pm	German

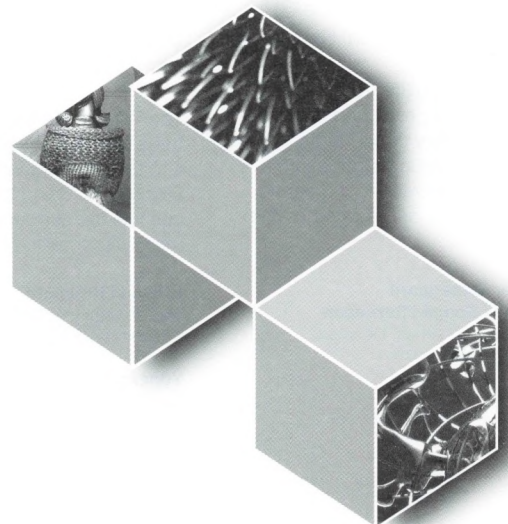
Thursday, 3 August

9 – 9:45 am	Korean
10 – 10:45 am	Chinese: Mandarin
11 – 11:45 am	Japanese

Sunday, 30 July

3 – 5:30 pm
**Art Gallery &
Emerging Technologies
Opening Reception**
Sponsored by City of Boston,
Thomas M. Menino, Mayor

Open to the general public



Emerging Technologies Sketches

Room 207

Learn more about the installations in Emerging Technologies. Researchers, engineers, educators, students, developers, and practitioners present their concepts, techniques, processes, and innovative approaches.

Monday, 31 July
10:30 am - 12:15 pm

Innovative Interfaces for Work, Fun, and Affection

Submerging Technologies

Three interactive water displays: a tantalizing fountain that withdraws when a hand comes near, a musical harp that has water "strings," and a liquid touchscreen.

Paul H. Dietz
Mitsubishi Electric Research
Laboratories (MERL)
dietz@merl.com

Jefferson Y. Han
New York University
Courant Institute of Mathematical
Sciences

Jonathan Westhues
John Barnwell
William Yerazunis
Mitsubishi Electric Research
Laboratories (MERL)

Tablescape Plus: Upstanding Tiny Displays on Tabletop Display

A novel tabletop display that utilizes placed objects as projection screens as well as input tools. It could open up possibilities for tabletop applications for games, simulation, education, and visualization.

Yasuaki Kakehi
Makoto Iida
Takeshi Naemura
The University of Tokyo
tablescape@hc.ic.i.u-tokyo.ac.jp

Mitsunori Matsushita
NTT Communication Science Labs

AR Tennis

A collaborative augmented reality game for face-to-face interaction on mobile phones. Two users can play tennis on a virtual court superimposed on the real world.

Anders Henrysson
NVIS, Linköpings universitet
andhe@itn.liu.se

Mark Bilinghurst
Mark Ollila
NVIS, Linköpings universitet

The Huggable: A New Type of Therapeutic Robotic Companion

A robotic companion featuring a full body "sensitive skin," novel voice coil actuators, cameras, microphones, an inertial measurement unit, and an embedded PC with 802.11g networking for relational affective touch.

Walter Dan Stiehl
Cynthia Breazeal
Massachusetts Institute
of Technology Media Lab
wdstiehl@mit.edu

Kuk-Hyun Han
Samsung Electronics Co. Ltd.

Jeff Lieberman
Levi Lalla
Allan Maymin
Jonathan Salinas
Daniel Fuentes
Robert Toscano
Cheng Hau Tong
Aseem Kishore
Massachusetts Institute
of Technology Media Lab

Tuesday, 1 August
8:30 am - 10:15 pm

Push, Pull, and Touch Technologies

Technical Aspects of the GPU- Accelerated Surgical Simulator

A surgical simulator for pediatric heart surgery developed through interdisciplinary cooperation with surgeons. Tissue deformation, a detailed visualization, and haptic interaction are accelerated by the GPU.

Jesper Mosegaard
Thomas Sangild Sørensen
University of Aarhus, Denmark
Mosegaard@daimi.au.dk

A Vision Substitution System Using Forehead Electrical Stimulation

The Forehead Retina System captures the view in front and converts it to tactile sensation by electrical stimulation. Using the device, users can feel the surrounding environment with their forehead skin.

Hiroyuki Kajimoto
The University of Tokyo
kaji@star.t.u-tokyo.ac.jp

Yonezo Kanno
EyePlusPlus, Inc.

Susumu Tachi
The University of Tokyo

Novel Tactile Contour Presentation: Embossed Touch Display

A novel tactile display that can present any given width of objects.

Hideyuki Ando
NTT Communication Science
Laboratories
Hide@avg.brj.ntt.co.jp

Junji Watanabe
PRESTO Japan Science
and Technology Agency

Tomohiro Amemiya
Taro Maeda
NTT Communication Science
Laboratories

Masashi Nakatani
The University of Tokyo

Perceptual Attraction Force: Exploit the Nonlinearity of Human Perception

A novel handheld force-feedback device that exploits the nonlinearity of human haptic perception. The device generates asymmetric acceleration in one cycle, a pushing or pulling sensation, to support nonverbal communication.

Tomohiro Amemiya
Hideyuki Ando
Taro Maeda
NTT Communication Science
Laboratories
t-amemiya@avg.brj.ntt.co.jp

Wednesday, 2 August
3:45 pm - 5:30 pm

Novel Methods for Capturing and Creating Images

High-Resolution, Real-Time-Geometry Video Acquisition

This video-acquisition system measures absolute coordinates of objects accurately. The data-acquisition speed is 90fps and 266K points per frame. Acquisition, reconstruction, and display are simultaneously realized at 30fps.

Song Zhang

Harvard University
szhang@fas.harvard.edu

Dale Royer

Geometric Informatics Inc

Shing-Tung Yau

Harvard University

Instant Replay Using High-Speed Motion Capture and Projected Overlay

A novel motion-capture device (low-cost, 500 Hz, unlimited number of markers), tracks the trajectory of an air-hockey puck. The trajectory is projected on the air-hockey table for slow-motion replay.

Hideaki Nii

Jay Summet

Yong Zhao

Jonathan Westhues

Paul H. Dietz

Mitsubishi Electric Research Laboratories (MERL)

Shree K. Nayar

Columbia University

Masahiko Inami

University of Electro-Communications

John Barnwell

Michael Noland

Vlad Branzoi

Erich Bruns

Ramesh Raskar

Mitsubishi Electric Research Laboratories (MERL)
raskar@merl.com

Interactive 3D Fluid Jet Painting

A real-time 3D fluid simulation technique using the Navier-Stokes equation for an axis-symmetric fluid column in order to create abstract paintings in the style of Jackson Pollock.

Sangwon Lee

Sven Olsen

Bruce Gooch

Northwestern University
s-lee21@northwestern.edu

Fabcell: A Multi-Color Fabric Module

Fabcell is a flexible, non-emissive, and multi-color fabric module. It is a fabric element, a textile version of pixels in a computer display.

Midori Shibutani

Akira Wakita

Keio University
Lestari@sfc.keio.ac.jp

Thursday, 3 August
1:45 - 3:30 pm

Wow, I Can't Believe My Eyes: Innovation and Illusion

Morphovision

A display system that interactively transforms and animates a 3D solid object. In this system, an object is rotated at high speed and illuminated with special lighting.

Takashi Fukaya

NHK Science & Technical Research Laboratories
fukaya.t-ha@nhk.or.jp

Toshio Iwai

Media Artist

Yuko Yamanouchi

NHK Science & Technical Research Laboratories

livePic

An interactive product that expands the experience of drawing. With livePic, users can "move" and "control" the pictures they draw. It senses users' interactions and moves pictures inside the canvas.

Makoto Katsura

Masa Inakage

Keio University
Makoto@makoto.to

A View-Oriented Interface for Block-Based Modeling

A 3D-modeling interface that is not only useful for three-dimensional positioning, but also increases intellectual curiosity by allowing users to examine objects from positions that are impossible in the real world.

Jun Fujiki

Taketoshi Ushiamo

Kiyoshi Tomimatsu

Kyushu University
fujiki@gsd.design.kyushu-u.ac.jp

Cubee: Thinking Inside the Box

An interactive, cubic, 3D display is suspended to enable viewing from all sides and free manipulation, creating a compelling interaction metaphor of objects inside a box.

Ian Stavness

Sidney Fels

The University of British Columbia
Stavness@ece.ubc.ca

AR Tennis

Sketch: AR Tennis, page 112

A collaborative augmented reality game for cell phones. On their cell phones, two players see a virtual tennis court overlaid on the real table between them. They move their phones to hit virtual balls across the net.

Enhanced Life

AR Tennis could enhance daily life because it shows how mobile phones could be used to create compelling, shared augmented-reality (AR) experiences. Current AR applications have limited use, largely because the required hardware is too expensive for the average consumer. However, hundreds of millions of phones are sold every year with integrated cameras, displays, and on-board processing, and so for the first time, average consumers have access to their own mobile AR platforms.

AR Tennis incorporates four key technologies to provide an engaging experience:

- Computer-vision-based camera tracking on a mobile phone
- OpenGL ES 3D graphics rendering
- Adhoc Bluetooth wireless networking
- Mobile-phone audio and haptic (vibration) feedback

These technologies are combined to create the first collaborative AR experience on a mobile phone.

Goals

To explore how consumer-level mobile phones can be used to provide a compelling, collaborative AR experience. This requires careful development of interface metaphors for mobile AR applications and investigation of how collaborative AR gaming is different from other types of mobile phone gaming. This project developed new mobile-phone AR interaction techniques and conducted user studies to compare collaborative AR games with more traditional mobile-phone gaming.

Innovations

Several core technical innovations are demonstrated in this project, including:

- The first port of the popular ARToolKit computer vision-tracking library to the Symbian operating system.
- The first collaborative AR application on a mobile phone.
- The first use of phone motion as an interaction metaphor for mobile-phone AR applications.
- One of the first true AR games with full six-degree-of freedom tracking on a mobile phone.
- One of the first uses of multimodal (sound and vibration) feedback in a mobile-phone AR application

The project also demonstrates the use of OpenGL ES in a mobile 3D game application and how Bluetooth can be used to develop a peer-to-peer communications layer to support mobile face-to-face collaboration.

Vision

In the same way that the first computer monitors allowed artists to view 3D computer graphics, this work gives artists and content developers a platform for creating collaborative experiences in the real world based on consumer cell phone hardware.

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argoGroup: The Interactive Theatre

Recipient of le Prix Emerging Technologies at Laval Virtual 2006 and presented as part of the exchange agreement between Laval Virtual and ACM SIGGRAPH.

The argoGroup theatre combines group navigation, social experience, and significant individual interaction. At SIGGRAPH 2006, the theatre presents a program of artistic, educational, and entertaining interactive shows in stereoscopy (3D).

Enhanced Life

In the argoGroup theatre, group interaction, immersion, high-end real-time graphics are presented in a strong, operational solution. Its control metaphor enables a group to actually control all the components of the show: image, sound, and special effects. Multilingual audiences can form teams to control the experience. The project relies on an innovative assembly of specific interaction hardware and software.

Goal

To demonstrate innovative, participative media for large audiences and immersive theatres in museums, theme parks, and other communication and entertainment venues.

Vision

This new medium (group and multilingual interaction) was developed to deliver educational content to a broader public and to involve the public in content consumption. Interaction delivers a much more powerful experience than “passive” consumption of the same information.

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Augmented Painting

An interactive tabletop augmented-reality setup that creates an artistic representation of the scene. Users can select a painterly, cartoon-like, or black-and-white illustrative style. Virtual objects are added and displayed in the same artistic style.

Enhanced Life

Augmented Painting combines augmented-reality techniques with real-time artistic stylization methods. This concept ("stylized AR") is still very new and was only recently introduced. The overall setup integrates video acquisition, video-based camera tracking, artistic video stylization, and artistic rendering in a single interactive, real-time system.

Goals

To create a novel augmented environment. Because real and virtual scene elements are equalized, they are difficult to distinguish. This leads to a new perception of the augmented scene and a new experience.

Innovations

Several new stylization algorithms were developed in order to generate a stylized augmented video stream at real-time frame rates. Some of these algorithms utilize the programmability of modern graphics processing units, which generates a highspeed, high-quality video stream that would have been impossible only a few years ago.

Vision

Several other interesting potential applications can be conceived for stylized augmented environments. Combined stylized representations of virtual and real objects can provide a novel experience in augmented-reality games, entertainment scenarios, and education and training applications. Since physical and graphical objects are difficult to distinguish in this type of augmented video stream, this might also lead to new impulses for immersive AR settings using head-mounted displays or translucent display setups. Since the user cannot tell whether an object in the immersive augmented environment is real or virtual, the technology might actually become more effective for some applications thanks to the stylization. We are currently considering potential uses in psychotherapy (for example, phobia therapy) and psychophysical studies (for example, face recognition in virtual environments).

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bubble cosmos

A system that produces real bubbles containing white smoke and projects CG images onto them. When users break the bubbles, they produce changes in the visual stimulus and sound effects.

Enhanced Life

bubble cosmos provides interactive entertainment in which users enjoy viewing and breaking bubbles of CG images drifting in the air. By actually touching and breaking these physically beautiful bubbles, users are surprised by a novel experience that is much different from conventional artificial entertainment.

Goals

Using smoke-containing bubbles as screens, the system produces visual effects never before experienced. Since the CG image is projected not onto the bubble surface but onto the smoke the bubble contains, it seems as if the image is actually inside the bubble. As the camera tracks the CG-projected bubbles, users perceive images drifting through the air along with the bubbles. The system is able to determine when the bubble disappears naturally or is broken intentionally, and timed sound effects produce an unexpected burst of explosion. In addition, the image is altered to produce the visual effect of swaying that is unique to spreading smoke.

Innovations

By automatically detecting the position and status of a bubble, bubble cosmos can accurately project a CG image onto a single location and can change the image while providing sound effects. To detect a bubble drifting in the air, the system processes images photographed by a fixed camera. The images are first converted into grayscale, and a moving object is detected from inter-frame differences. Although it is difficult to detect the shape of an ordinary bubble, the smoke inside enables clear detection. Then noise is eliminated by Gaussian Pyramid processing, and images binarized with an appropriate threshold are labeled to judge whether a bubble exists in the sequence. For this judgment, several parameters reflecting the bubble characteristics are used. The bubble position and size are detected at the same time. Whether the bubble has broken or not depends on whether the same bubble is in the next frame. A CG image is projected onto a bubble from a projector just under the fixed camera. Since the optical axes of the camera and projector are very close to each other, projection onto a bubble can be realized by conversion from simple camera coordinates to projector coordinates. A bubble generator automatically generates a few bubbles about every 15 seconds. Smoke is generated by a smoke machine that heats a solution delivers the smoke to the bubbles.

Vision

bubble cosmos offers a new presentation platform. For example, the system could be used as a beautiful interactive display for advertising. A corporate logo or product name could be projected onto a bubble, and a commercial message could be displayed on a separate screen when a bubble is broken. The system could also be used as an educational tool for small children. For example, the letter "D" could be projected onto a bubble and a dog displayed along with a "bow-wow" sound when the bubble is broken. When this possibility was tested in trial experiments, children were deeply interested in the images and surprised at the sound effects when a bubble was broken. The system worked effectively as an educational tool.

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Copycat Hand

A humanoid robot hand that imitates the motions of human at 150 fps or faster.

Enhanced Life

This “copycat” robot hand can perform dexterous motions like those of human beings, and, in the near future, it will be able to create new motions. For example, it is now learning how to hold and handle a pen and write characters by watching and mimicking human motions. This achievement will support development of intelligent robots that can generate various kinds of useful motions and solve problems by themselves in the real world.

Goal

To implement a robot that can learn to perform dexterous human motions.

Innovations

Copycat Hand proposes a new hand-posture estimation method that rearranges a large-scale database with a self-organizing map. The technique includes self-reproduction and self-annihilation, which enable two-step searches of similar images with minimal processing time and errors, and without search deviation.

Vision

The next step in this project is to develop matrix-pressure sensors that are as thin and soft as human skin. A robotic hand with those characteristics, and with sufficient degrees of freedom in its movement can continue progress toward a robot that can learn human dexterous motions by observation.

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Cubee: Thinking Inside The Box

Sketch: Cubee: Thinking Inside The Box, page 113

An interactive cubic fish tank VR display that is suspended to enable viewing from all sides and free manipulation. The compelling interaction metaphor of objects inside a box can be used to evaluate interactive realism in dynamic simulations.

Enhanced Life

Cubee encloses a small virtual space inside the physical boundaries of a cubic display. It uses the metaphor of objects contained within a physical box to achieve an engaging interactive experience.

Goals

To build a novel interactive display system that provides a unique physical experience with computer-generated, physics based animation. Cubee brings dynamic simulation into the participant’s physical space and supports interaction that maintains a coherent relationship between the virtual and physical worlds.

Innovations

The display extends head-tracked perspective rendering by allowing interaction with a multi-display system that renders virtual objects behind the display plane as if they are inside the box. This differs from the conventional approach, in which virtual objects float in front of the display, and enables the seams of the LCD panels to be used as occlusion cues to help realize the “inside the box” metaphor. Cubee’s design affords a large movement space around the entire display, which enhances motion parallax cues for a strong 3D effect. Cubee’s surrounding view space allows for full inspection of a 3D object as the participant physically moves around the display or rotates the physical display to view all sides of the object, both of which are physically coherent interactions. Participants are not required to use a mouse or other input device to manipulate objects in the virtual scene: movement of the display causes the objects to respond just like real objects in a real box.

Vision

Real-time dynamic simulations of any variety, including multiple rigid bodies, fluid, sand, smoke, or other natural phenomena are uniquely suited to this type of display. In the near future, Cubee displays could become the de facto standard test bed for examining and evaluating the realism of physics-based computer animation.

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Deskrama

An interactive space browser for architectural designs. Moving its lightweight LCD panel on a building's plan drawing displays a 3D interior view of the building.

Enhanced Life

Deskrama deploys a high-resolution position sensor to find the position of a lightweight LCD panel placed on a plan drawing of a building. It uses radiosity-based photorealistic visualization technology to interactively display on the LCD panel a three-dimensional interior view of the building model as if it were placed on the plan and sectioned at the position where the LCD panel touches the drawing.

Goal

To help a viewer understand architectural designs by spatially co-relating two projections: a two dimensional abstraction in a plan drawing and a photo-realistic interior perspective viewed from an arbitrarily cut plane, each of which has a unique role in representation of architectural design.

Innovations

Deskrama achieves an exact spatial synchronization of the architectural plan and a three-dimensional interior view of the corresponding virtual model above it. The view's angle is interactively adjusted to that of a viewer moving the panel, and a photorealistic perspective view is generated from a precomputed radiosity solution file. Also, altering the plan drawing with an infrared tag changes the display to a model of a corresponding building.

Vision

Deskrama has the potential to change the way we examine a three-dimensional virtual model of an object that has an important interior space. Unlike goggle-based interactive virtual reality hardware, there is no burden on the viewer's eyes, and many people can share the same image. Cutting a section of an object with an LCD display that shows the inside of the object through that section is highly intuitive and requires no explanation. The initial motivation for Deskrama was architectural modeling, but its possible future applications include: medical examination of the human body, visualization of underground geological formations, and automobile design. Future development will synchornize a larger number of different projections and allow an interactive space browser for architectural designs. Moving its lightweight LCD panel on a building's plan drawing displays a 3D interior view of the building. The LCD display to be placed at any three-dimensional angle away from the plan on the table.

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DigiWall

A sonically enhanced climbing wall with illuminating foot and hand grips. Sensors embedded in the grips and seven audio speakers enable computer mediated, interactive, musical and physical games.

Enhanced Life

Computer games have become very strong motivators in entertainment and education, and they are finding new applications in fields as diverse as health care and military training. Music is another strong motivator because it can enhance drama, establish a sense of time and place, and inspire and synchronize movement. DigiWall combines these components with a large-scale, highly physical computer interface to create a unique opportunity for physical activity and conditioning.

Goals

The DigiWall project has three main goals:

1. To create new potential for increased physical activation and improved physical conditioning through a computer game experience.
2. To build a platform that can be used to test and research the potential for sound-based interaction in large-scale environments.
3. To explore how sound and music can support a narrative in a large, tangible, interactive scenario.

Innovations

The Sonic Studio at the Interactive Institute has designed a hand and foot grip for DigiWall that allows touch sensors and light to be integrated into the interactive climbing experience. The system also includes a sound-based game engine that integrates sensors and sound-rendering components into a large-scale computer interface.

Vision

Shifting the focus from visual displays to interfaces built on sound will free people physically and open up the potential for whole-body movement as a way to interact with computer systems. DigiWall is intended for public spaces and will affect and enhance the environments where it is installed, both visually and sonically.

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Embossed Touch Display: Illusory Elongation and Shrinking of Tactile Objects

Sketch: Novel Tactile Contour Presentation: Embossed Touch Display, page 112

A novel tactile display that can present any given width of objects. When the touched object moves, the object is perceived to elongate or shrink. Visual images synchronized with the tactile information are presented simultaneously.

Enhanced Life

Embossed Touch Display can present any given width of objects. In the real world, when we touch an object, we move our hands, and our fingertips gather and information sequentially. In this project, the object moves during the hand movement, and the illusory width of the object can be perceived. Insight into human tactile perception and advanced control of the object's movement have generated this new style of tactile display.

Goals

To develop a novel tactile display that can present not only shape, but also texture, viscosity, and other surface features. Eventually, this project will expand to a tactile-based multimodal information display that will be used to investigate the mechanisms of human tactile perception and apply them to tactile input/output interfaces.

Innovations

The main technical innovation is advanced control of the object in accordance with measured hand movements. The display is implemented with a laser distance sensor and a liner slider. The sensor measures the distance between it and the finger, and the liner slider is controlled in accordance with the distance. In addition, a small visual display can be mounted on the liner slider, so that any given width can be presented with synchronized visual images.

Vision

In daily life, we often work surrounded by flat-surface visual displays. The tactile-based multimodal Embossed Touch Display can add the sense of touch to such displays. It can be applied as a new tool for artistic expression, and it will significantly influence user-interface research and other scientific investigations.

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Fabcell

Sketch: Fabcell: A Multi-Color Fabric Module, page 113

A textile version of pixels in a computer display. Fabcell enables expression of visual images in real space because it displays images on the curves of flexible textiles.

Enhanced Life

In Fabcell, fibers dyed with liquid crystal ink and conductive yarns are woven into a square textile. The ink changes color from transparency to red, green, and blue as voltage is applied to the conductive yarn, changing the fabric's temperature.

Goals

To realize graphics in the real world by displaying images on clothing, curtains, or furniture, and to move image-display technology from rigid devices like LCDs to flexible curved surfaces.

Innovations

When Fabcells are arranged in matrices, they form a flexible display. Unlike OLED displays or emissive devices using fiber optics, Fabcell is a non-emissive and flexible textile.

Vision

In Fabcell, the fusion of chemistry and electro technology shifts the visual-display platform from hard panels to soft and portable textiles. In future work, Fabcell will be miniaturized. If the resolution of the Fabcell textile is high, images can be downloaded and burned into the fabric. Using Fabcell, clothing or curtains will be changed as if they are display devices, and our living spaces will become more informative and attractive.

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Fingertip Digitizer: Applying Haptics and Biomechanics to Tactile Input Technology

A novel fingertip-mounted haptic sensing digitizer that captures physical phenomena at the fingertip during a user's tactile activities. The complex biomechanical characteristics of the finger can achieve delicate input actions in art, medicine, and industry.

Enhanced Life

Because tactile and haptic stimuli are shared by humans and computers, this system supports exploratory tasks such as palpation for examining glands or tumors. The system does not require touch screens. Any patterned finger motions or any contact force-acceleration responses are valid modalities for input.

Goals

Development of a fingertip-mounted digitizer. Investigation and development of biomechanical models of fingertip characteristics. Development of multi-modal mapping systems of tactile and haptic stimuli.

Innovations

This new fingertip-mounted device uses miniature thin-film force sensors, a tri-axial accelerometer, and a motion tracker. A realtime, network-based, multi-rate data-acquisition system was developed using LabVIEW virtual instrumentation technology. Biomechanical models based on human-subject studies were applied to the sensing algorithm. A new 2D touch-based painting application (Touch Painter) was developed with a new portable, touch-based projection system (Touch Canvas). Also, a new 3D object-digitizing application (Tactile Tracer) was developed to determine object properties by dynamic tactile activities, such as rubbing, palpation, tapping, and nailscratching.

Vision

Human finger activity represents tremendous potential in digital interaction technologies. Because this free-hand touch technology does not require a screen, it will significantly change the conventional input paradigm for many manual tasks in art, medicine, and industrial operations. For example, this freehand, direct finger-touch technology a promising alternative to existing stylus-based or probe-based interfaces, such as the computer mouse and medical diagnostic systems.

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Forehead Retina System

Sketch: A Vision Substitution System Using Forehead Electrical Stimulation, page 112

A small camera and 512 forehead-mounted electrodes capture the frontal view, extract outlines, and convert the data to tactile electrical stimulation. The system is primarily designed for the visually impaired, but it can be a third eye for users with normal sight.

Enhanced Life

Although electrical stimulation has a long scientific history, it has not been used for practical purposes because stable stimulation was difficult to achieve, and mechanical stimulation provided much better spatial resolution. This project shows that stable control of electrical stimulation is possible by using very short pulses, and anodic stimulation can provide spatial resolution equal to mechanical stimulation. This result was presented at SIGGRAPH 2003 as SmartTouch, a visual-to-tactile conversion system for skin on the finger using electrical stimulation. Because the Forehead Retina System shows that stable stimulation on the "forehead skin" is also quite possible, it leads to a new application of electrical stimulation.

Goals

According to a 2003 World Health Organization report, up to 45 million people are totally blind, while 135 million live with low vision. However, there is no standard visual substitution system that can be conveniently used in daily life. The goal of this project is to provide a cheap, lightweight, yet fully functional system that provides rich, dynamic 2D information to the blind.

Innovations

The big difference between finger skin and forehead skin is the thickness. While finger skin has a thick horny layer of more than 0.7 mm, the forehead skin is much thinner (less than 0.02mm). Therefore, if the electrode directly contacts the skin, concentrated electrical potential causes unnecessary nerve stimulation and severe pain. The Forehead Retina System uses an ionic gel sheet with the same thickness and electrical impedance as the horny layer of finger skin. When the gel sheet is placed between the electrode and the forehead, stable sensation is assured. Compared to current portable electronic devices, most of the proposed "portable" welfare devices are not portable in reality. They are bulky and heavy, and they have a limited operation time. By using electrical stimulation, the Forehead Retina System partially solves these problems. Nevertheless, driving 512 electrodes with more than 300 volts is quite a difficult task, and it normally requires a large circuit space. The system uses a high-voltage switching integrated circuit, which is normally used to drive micro-machines such as digital micro-mirror devices. With fast switching, current pulses are allocated to appropriate electrodes. This approach enables a very large volume of stimulation and system portability at the same time.

Vision

This project demonstrates only the static capabilities of the display. Other topics pertaining to the display include tactile recognition using head motion (active touch), gray-scale expression using frequency fluctuation, and change in sensation after long-time use due to sweat.

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Freqtric Drums

A device that transforms an audience into a drum. The performer and audience create music by touching their hands and other parts of their bodies: feet, foreheads, noses, etc.

Enhanced Life

Freqtric Drums uses electro-dermal activity and human skin resistance to detect skin contact. The circuit regards the human body as a conductor for intra-body transmission and outputs drum sounds as MIDI signals.

Goal

To complete a new musical interface and instrument.

Innovations

Human skin contact has never been used before as an interface device.

Vision

Music and skin contact are original components of human communication. Through digital technology, Freqtric Drums allows participants to simultaneously enjoy both.

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Hand-Shadow Illusions and 3D DDR Based on Efficient Model Retrieval

An installation art system that children can use to play hand-shadow illusions or pose to match images dynamically shown on the screen as background music plays.

Enhanced Life

This project integrates image processing, 3D model retrieval, and traditional games to create new installation art.

Goals

To allow users to move their bodies or hands to create an image, and use the 3D model retrieval system to evaluate their performances in an interesting game.

Innovations

The system blends traditional children's games with an up-to-date 3D model retrieval system.

Vision

Such a system installed in subway stations or public buildings will encourage people to relax, play, and think. The system may inspire another interaction method with the addition of multiple cameras and a 3D server as background knowledge. It could also be seen as another (not very accurate but very low cost) method for motion capture.

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Digimax Production Ltd.

(audio rights)

High-Resolution, Real-Time-Geometry Video Acquisition System

Sketch: High-Resolution, Real-Time-Geometry Video Acquisition, page 113

A geometry video acquisition system that measures both geometries and positions of objects accurately. The data acquisition speed is 90fps and 266,000 points per frame. Acquisition, reconstruction, and display are simultaneously realized at 30fps.

Enhanced Life

This technique takes full advantage of a digital-light-processing (DLP) projector and uses a unique method to synchronize a camera with the projector. The phase-shifting algorithm, which has unique advantages over other algorithms, is used to its extreme. It uses the minimum number of fringe patterns as it obtains the maximum possible information.

Goals

To measure absolute motions of both geometric shape and positions of deformable objects in real time to generate geometry videos and to find potential applications in various fields.

Innovations

The main innovation is integration of the whole system, to develop highly efficient and robust software algorithms, and to measure absolute coordinates of objects pixel by pixel in real time.

Vision

Capturing 3D geometric data can be as simple as acquiring 2D images. Recording 3D videos is no longer a difficult task. Without knowing the internal technology, you can own one device and capture your own geometric data immediately. The geometric video acquisition system can be applied in many fields. One immediate application is 3D modeling of facial expressions in games, for example. Since acquisition, reconstruction, and display are done in real time, digitizing players and putting their faces into virtual game worlds will be feasible in the near future. Another application is animation and movies, where real captured video data can be used in animation immediately. The system can also be applied to plastic surgery and homeland security. The geometry of the object overcomes many shortcomings of security checking techniques based on 2D images, such as facial recognition, finger prints, etc. Other applications include motion capture, fast prototyping, virtual reality, feature films, dentistry, human computer interaction, robotic vision, reverse engineering, industrial measurement, and inspection.

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The Huggable: A Therapeutic Robotic Companion for Relational, Affective Touch

Sketch: The Huggable: A New Type of Therapeutic Robotic Companion, page 112

A new type of robotic companion inspired by pet-therapy research. Unlike current robotic companions, the Huggable features a full-body sense of touch; silent, smooth voice-coil actuators; and an embedded, networked PC.

Enhanced Life

Over the past few years, the Robotic Life Group at the MIT Media Lab has been developing “sensitive skin” and novel actuator technologies in addition to our artificial-intelligence research. The Huggable combines these technologies in a portable robotic platform that is specifically designed to leave the lab and move to healthcare applications.

Goals

The ultimate goal of this project is to evaluate the Huggable’s usefulness as a therapy for those who have limited or no access to companion-animal therapy. In collaboration with nurses, doctors, and staff, the technology will soon be applied in pilot studies at hospitals and nursing homes. By combining Huggable’s data-collection capabilities with its sensing and behavior, it may be possible to determine early onset of a person’s behavior change or detect the onset of depression. The Huggable may also improve day-to-day life for those who may spend many hours in a nursing home alone staring out a window, and, like companion-animal therapy, it could increase their interaction with other people in the facility.

Innovations

The core technical innovation is the “sensitive skin” technology, which consists of temperature, electric-field, and force sensors all over the surface of the robot. Unlike other robotic applications where the sense of touch is concerned with manipulation or obstacle avoidance, the sense of touch in the Huggable is used to determine the affective content of the tactile interaction. The Huggable’s algorithms can distinguish petting, tickling, scratching, slapping, and poking, among other types of tactile interactions. By combining the sense of touch with other sensors, the Huggable detects where a person is in relation to itself and responds with relational touch behaviors such as nuzzling. Most robotic companions use geared DC motors, which are noisy and easily damaged. The Huggable uses custom voice-coil actuators, which provide soft, quiet, and smooth motion. Most importantly, if the Huggable encounters a person when it tries to move, there is no risk of injury to the person. Another core technical innovation is the Huggable’s combination of 802.11g networking with a robotic companion. This allows the Huggable to be much more than a fun, interactive robot. It can send live video and data about the person’s interactions to the nursing staff. In this mode, the Huggable functions as a team member working with the nursing home or hospital staff and the patient or resident to promote the Huggable owner’s overall health.

Vision

As poorly staffed nursing homes and hospitals become larger and more overcrowded, new methods must be invented to improve the daily lives of patients or residents. The Huggable is one of these technological innovations. Its ability to gather information and share it with the nursing staff can detect problems and report emergencies. The information can also be stored for later analysis by, for example, researchers who are studying pet therapy.

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Incompatible BLOCK: Wonders-Accompanied Interface

Sketch: A View-Oriented Interface for Block-Based Modeling, page 113

For interface design, improving user curiosity is important, as is intuitiveness and intelligibility. The wonder of 2D property input becoming 3D will also be effective for enhancing availability. Incompatible BLOCK is 3D-modeling software with an interface of such wonders.

Enhanced Life

This project shows how users can complete a task comfortably by using software with an interface of wonders.

Goal

To apply wonders as an element of effective interface design to enhance user curiosity and to help users and user-interface designers understand the important of wonders.

Innovations

Modeling interfaces of commercial 3D modeling software have been developed with an emphasis on intuitiveness and distinctness. This project offers a new approach to 3D-modeling interface design.

Vision

Incompatible BLOCK incorporates wonders derived from the discrepancy between three dimensions and two dimensions to enhance user curiosity. This will enhance curiosity and availability.

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Instant Replay

Sketch: Instant Replay: Using High-Speed Motion Capture and Projected Overlay, page 113

Real-world, slow-motion instant replay for air hockey. This new space-labeling technology tracks the pucks with a high degree of accuracy and speed (1cm/500 Hz) in natural illumination without visible tags.

Enhanced Life

Instant Replay is an inexpensive, highly accurate "motion capture" system that effectively tracks many fast-moving, rotating objects. The system works at very high frame rates (500 Hz) and reduces cost by employing relatively simple LED projector components instead of high-speed cameras. The cost of the system is only a few hundred dollars.

Goal

To demonstrate a new space-labeling projector technology within a fast-paced, engaging, high-impact setting that presents multiple challenges to system throughput and component wear.

Innovation

The core technical innovation of this work is the system's space-labeling technology. An array of inexpensive, solid-state, high-speed LED devices project 10,000 invisible (infrared) patterns per second into the space. Any number of photo-sensing tags within the space detect these patterns and are thereby able to determine their own locations. Since the entire space is "labeled," the speed of the system remains constant regardless of the number of tags being tracked. The tags use very inexpensive, off-the-shelf IR-decoding modules and micro-controllers. The tags can be detected in natural environments (under natural illumination and imperceptibly embedded on natural surfaces). Traditional motion capture systems require high contrast between tags and background.

Vision

The theoretical maximum speed of this system is much higher than our (500 Hz) prototype and is limited only by the speed of optical communication components. This technology could be used in a variety of industrial applications such as tracking crash-test dummies or localizing robots. In the future, space-labeling projectors might be deployed throughout buildings and other space, allowing people (or their electronic devices) to determine their precise location at any time.

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Interactive 3D Fluid-Jet Painting

Sketch: Interactive 3D Fluid-Jet Painting, page 113

An interactive digital system that allows users to create abstract paintings in the style of Jackson Pollock. Users can analyze the fractal properties of the images they create and compare them to those known to exist in Pollock's own paintings.

Enhanced Life

This project implements a painting interface using the Diamond Touch Table developed at Mitsubishi Electric Research Laboratories (MERL). The table provides a large projection surface that multiple users can touch to control programs.

Goal

To create a tool that both engages and informs the artistic process.

Innovations

The system has two components: a one-dimensional model used to determine the width of the jet, and a 3D model that tracks the motion of the jet. Each model influences the other, and together they form a convincing approximation of fluid-jet motion that is both stable and computationally inexpensive. The system uses a different mathematical model for each factor. For the transmission of fluid along the fluid-jet axis, it uses the Navier-Stokes equation in cylindrical coordinates. To model the free motion of a 3D fluid jet, it applies fluid forces to discretized points along the fluid-jet axis line. These two models exchange parameters at each time step. When the jet hits a solid surface, an implicit function in two dimensions is used to propagate fluid patterns. When the jet hits the canvas, it leaves behind a smooth trail of paint, which is calculated and maintained using implicit surfaces.

Vision

In the late 1940s, the American painter Jackson Pollock developed a style of painting in which he unrolled a large canvas across the floor of his barn and dripped, drizzled, and poured household paint on it. His technique generated a sensation among critics accustomed to traditional brush strokes, who thought Pollock's work was purely accidental, but he denied such claims. "I can control the flow of the paint," Pollock contended. "There is no accident."

Recent mathematical analysis indicates that the fluid-jet patterns of Pollock's painting may be related to fractal structure. The paintings contain self-similar patterns that contribute to the aesthetic quality of the work. This may suggest a correlation between the statistical properties of some abstract art and its aesthetic value. While computers can calculate these properties explicitly, humans may only be able to recognize them subconsciously. As Pollock's painting style matured, the fractal dimension of his images increased.

Interactive 3D Fluid-Jet Painting includes an evaluation tool that calculates the fractal dimensions of a user's painting. Unlike real-world paintings, this digital system makes users aware of fractal properties interactively, and they can easily compare the fractal characteristics of each individual's work.

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An Interactive Multi-User Holographic Environment

An interactive, multi-user holographic environment that allows naked-eye participants to share a large 3D scene with fully continuous, observer independent parallax.

Enhanced Life

This holographic display is a unique combination of optimized optical design, commodity hardware technology, and parallel graphic technology packaged in a system that can be directly driven by a stream of graphic commands. The prototype's overall 50 megapixels originate from the resolution of 64 XGA (1024x768) commodity projectors. The projectors are densely arranged behind the holographic screen, and all of them project their specific images onto the holographic screen to assemble the 3D scene. The display reconstructs the light field of 3D scenes instead of views. This distributed image organization makes it different from other known multi-view solutions. The optical modules are not associated with specific view directions. A module image is not a 2D view of the final image. Instead, the light beams emitted by the projection modules (the module images that are generated by the projectors) are determined by geometry. Each view of the 3D image is always contributed by many modules, so no sharp boundary appears between views, and the display offers continuous and smooth change at different image areas. It provides a truly 3D experience. The system includes a markerless, vision-based hand tracking system, so participants can intuitively use one- and two-handed gestures to determine pose, scaling, and selection of subparts of the rendered scene, and exploit powerful natural 3D interaction metaphors from everyday life (such as grabbing objects to move them).

Goal

To show a working example of a large-scale display that allows natural and naked-eye, multiple-user interaction with virtual three-dimensional objects.

Innovation

This is the first practical demonstration of a hardware and software system capable of showing accurate interactive three-dimensional images with full, observer-independent, continuous parallax within a large workspace.

Vision

This project is clearly a significant step forward in display technology, and it paves the way to novel approaches to complex cooperative tasks, such as designing intricate manufactured objects or understanding complex simulation results. This technology will also have interesting applications in many other domains, including entertainment, art, and cultural heritage (for example, museum exhibits). Future 3D display technologies that exceed current 2D technologies by 100x-1,000x are no longer a futuristic dream. This project is partially supported by the European Union FP6/IST at COHERENT.

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INVISIBLE ~The Shadow Chaser~

An interactive game that helps players sense unseen existences through indirect information such as their shadows, sounds, and weights. In this game, "invisible" goblins sneak around, but you can only see their shadows. Your mission is to chase their shadows and capture them with a special vacuum.

Enhanced Life

This project presents an object's existence in the real world using multi-modal perceptions, a concept that may be useful for supporting barrier-free services for handicapped people in public and entertainment spaces.

Goals

The goal of this project is to help users feel the existence of specific objects through indirect information and to show that the approach can be effectively implemented as a simple virtual reality system.

Innovations

The interactive system allows users to feel the presence of 3D virtual objects without stereoscopic visual information. It includes:

1. Capturing 3D information (position and orientation) from the projector.
For natural projection of the shadow shapes, the 3D position and orientation of the projector are obtained in real time with a simple method:
 - Two infrared LEDs and a 3DOF (degrees of freedom) tracker are attached on the projecting device.
 - Infrared LEDs are used to obtain the distance from a camera with an IR transmission filter, using the known geometry of the LEDs.
 - Information on pitch, yaw, and roll is obtained from from a 3DOF tracker.

The observed pattern of the LEDs is corrected by the orientation of the gyro, so the size of the LED pattern shows the distance from the camera. This combination of the 3DOF tracker and the simple LEDs arrangement enables high-speed tracking and positioning of the projector device.

2. A system to present indirect information (shadows, sounds). To make players feel the goblin's existence, the system provides indirect information such as the shadows and sounds of goblins instead of direct images.
 - Shadow projector
Each goblin's position is controlled and placed in a virtual space that modeled on a real room. To project a shadow image based on the 3D position of the projector, the rendering viewpoint is set to the projector in the real world. To render the goblin's shadow, the material color of the goblin is set to black, and reflectivity is set to none. The rendered image is masked to create an actual spotlight shape. Dynamic image is calculated by the projector, and the goblin's shadow is shown properly in the real world.
 - Sounds
When the goblins move, players can hear their footsteps. The volume of the sound changes depending on the goblins' position on the floor. When players capture goblins, they hear the goblins' scream and vacuuming sounds.
3. A capture device
The responses of the goblins are very important. Players feel a sense of capture through vibration weight change. A number of small vibrating motors are fixed in the hose of the device. When players capture the goblin, these motors vibrate sequentially from the nozzle toward the handle. Then a large vibrating motor in the backpack presents a sense that the captured goblin is struggling. At the same time, water is moved from a tank on the ground to another in the backpack, so players feel the weight of the captured goblins.

Vision

When users experience INVISIBLE, they feel that fantasy objects actually exist, as children imagine that their fantasies are real as they listen to fairy tales. The projector displays a 3D object's existence and behavior. Simple location techniques monitor users' intentions and react to them. The system demonstrates a new technique for integrating the real world and the virtual world. The next generation of this work will create a world in which many people clearly sense the existence of virtual objects and freely interact with and control them.

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livePic

Sketch: livePic, page 113

An interactive product that expands the drawing experience. With livePic, you can "move" and "control" the pictures you draw. It senses your interaction from the board, and pictures move inside the canvas as if they are alive.

Enhanced Life

livePic stimulates children's potential creativity and sensibility.

Goals

To interconnect a still camera, a video camera, and objects in the real world, and deliver diversified information to a contextaware system.

Innovations

The major innovation is the interactive relationship between the image and the user's physical action. It is not easy to move a picture that you draw, whether the medium is digital or analog. Unlike other digital systems, livePic requires no configuration. Its intuitive interface can move the image in real time and help the user discover joyful new experiences.

Vision

livePic explores the play style of the future by blurring the boundary between art and science.

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Morphovision

Sketch: Morphovision, page 113

A unique display system that interactively transforms and animates a 3D solid object. A model house rotates at high speed, illuminated with special lighting from a digital projector, which distorts it into various shapes.

Enhanced Life

Like TV systems, Morphovision employs persistence of vision, so it has potential as a new 3D image-display technique for television.

Goal

To create unique three-dimensional images and pursue this technology's application as a 3D image system of the future.

Innovations

The line-shaped images of the digital projector are used as lighting for the high-speed rotating model. The model's highspeed rotation is synchronized with the lighting by a rotating polygon mirror that reflects the line-shaped CG images of the digital projector. The type of lighting is controlled by a touch panel.

Vision

Morphovision's sense of reality and freedom of transforming and distorting a solid model has never been realized with previous technology. There is currently a great difference between real life models and digitally composited models, but Morphovision will obscure the boundaries between them and greatly influence future art and science displays.

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MOVE

In this installation, computer vision and full-body interaction allow participants to experience six different types of actions usually performed by avatars in videogames.

Enhanced Life

Unlike most computer-vision or sensor-based games like Eyetoy or Dance Dance Revolution, in MOVE the player IS the avatar. Players do not see representations of themselves or indirect results of their actions on a separate screen. Instead, they interact directly with the projected graphical constituents of the game. Because those graphical elements are nonrepresentational, they do not allow for a projection in a fictional space. The combination of abstracted shapes and direct interaction reinforces the player's focus on the action itself instead of an ulterior goal.

Goal

To create a video-game user experience with the setting and methods of interactive art.

Vision

MOVE investigates the field of game art from a user perspective by situating it at the intersections of art, games, and interactive media.

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MRI (Mixed-Reality Interface)

A novel approach to intuitive and self-explanatory interaction between a crowd of untrained persons and highly sophisticated software applications. The MRI project is focused strongly on usability and user-behaviour issues.

Enhanced Life

The MRI consists of an observation unit and a navigation surface. The observation unit contains a computer and a digital camera that captures images of tracking targets as they move across the navigation surface. Technically, the MRI is a creative assembly of existing components, with some innovative modifications. The major innovation is its high usability.

Goals

To develop a simple-to-use human-computer interface suitable for a situation in which:

- Untrained persons are expected to be able to manipulate complex software.
- Dozens of visitors should be able to experience a particular presentation simultaneously.
- The situation demands a highly stabile presentation system, including the capability to withstand spilt coffee or visitors bumping into it.
- Illumination and sound cannot be fully controlled (for example, noisy places with many photographers).

Innovations

In order to implement the tracking system, an existing template-based algorithm was significantly improved to meet the MRI's high robustness requirements. All visualization software is commercial. Also the MRI hardware is built from off-the-shelf components only.

Vision

The MRI is a constituent for implementing "remote applications" that do not molest the average user with technical detail. The technology behind the MRI is a sound platform for developing innovative human-computing interfaces for 21st-century demands.

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Multi-Touch Interaction Wall

A 16-foot-long rear-projected interactive display that has the unique ability to sense multiple points of touch from any number of users simultaneously with unprecedented precision and accuracy.

Enhanced Life

While touchscreens that register single points of contact are commonplace, multi-touch systems allow the user to interact with both hands and multiple fingers at the same time. These forms of interaction hold tremendous potential for advances in efficiency, usability, and intuitiveness.

Goals

To inspire people to go beyond the mouse pointer, to show how we should be interacting with machines in ways that are more natural, intuitive, and fun.

Innovations

This is the most sophisticated interactivity ever enabled for a display of this size. It is realized through the exceptional scalability of the frustrated total internal reflection (FTIR) technique for multi-touch sensing.

Vision

Multi-touch interaction is one of the most exciting areas in user interface research and will certainly play an important role when interactive display surfaces are ubiquitous.

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Perceptual Attraction Force: The Sixth Force

Sketch: Perceptual Attraction Force: Exploit the Nonlinearity of Human Perception, page 112

A novel handheld force feedback device that exploits the nonlinearity of human haptic perception. The device generates asymmetric acceleration in one cycle, a pushing or pulling sensation, to support nonverbal communication.

Enhanced Life

Most force-feedback devices must use heavy worn devices, huge air compressors, or some mechanical linkage to establish a fulcrum relative to the ground. None of them can be used freely outside the laboratory. This device is the first handheld force-feedback device that can be used outdoors. It could be embedded in mobile devices such as cellular phones and iPods to create a new tool for communicating with gestures, guiding users along a path, teaching the perfect golf swing, and dancing.

Goals

The ultimate goal of this project is to enable many people to communicate with anyone, anywhere, anytime by using nonverbal information that can be easily shared beyond cultures and languages. The project examines the characteristics of human haptic perception (theory) and designs compact practical devices (implementation).

Innovations

The most important innovation of this demonstration system is the novel force-feedback interface, which was designed and developed to generate asymmetric acceleration. The device induces the illusion of a pushing or pulling force with no external fulcrum. With a rotational motor for pan motion, the device can create a virtual force in an arbitrary direction on a two-dimensional plane. Commercial angular sensors allow the device to measure the orientation of participants. The orientation data from two devices (or participants) are sent to the main computer wirelessly. The orientation of the devices is controlled to ensure that the tracks of participants intersect (they meet). The device also captures the trajectory of the participants with an infrared camera; each device is equipped with an infrared LED. By matching the trajectories, virtual footprints of the participants are displayed on the ground from overhead projectors.

Vision

The device is suitable for applications such as communication, entertainment, and education through mobile devices. In the future, all mobile devices will include this technology. Cellular phones that include this device and GPS will intuitively guide you to where you want to go even if you do not watch the screen. We also plan to use this technology to extend the capability of visually impaired people.

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Powder Screen: A Virtual Materializer

A screen made of a pool filled with fine polystyrene beads that can completely hide real objects and seamlessly transform images of virtual objects into real objects and vice versa.

Enhanced Life

This new form of displaying images combined with other technologies is expected to be used in the near future by the entertainment industry. The Powder Screen not only enables materialization of virtual objects, but also adds new interactive features such as the ability to touch objects projected on the screen. Other elements and techniques, such as exposing the surface to controlled currents of air, create the visual sensation of flow or movement of sand, water, or any image that is displayed on the screen.

Goals

To transform the way we interact with and perceive virtual images. Real objects provide tangible, direct, intuitive interaction. Humans are able to perceive properties of materials that cannot be replicated by objects (in virtual reality systems). On the other hand, when we create, deform, or handle real objects in the real world, we face numerous restrictions. Virtual objects are free from these restrictions but lack real presence. With the Powder Screen, virtual and real objects can transition from one world to the other.

Innovations

The most important innovation in this project is the use of powder beads as a screen. With this ultra-fine grain spread inside an open case the system can maintain image resolution. The size of the beads plays an important role in displaying images; the small diameter (around 0.5mm) strongly contributes to the high resolution of the screen, while the use of larger beads would cause surface bumps and blurry images. To allow objects to move from the screen, the system incorporates an existing technology called the SPIDAR system, which allows the addition of force interaction. With the SPIDAR system, the object moves freely all along the screen and displays force interaction between user and object. Other techniques, such as using fans to generate air currents on the surface of the screen add visual effects such as flow in the displayed image. Since the powder beads are very light, this movement effect provides a visually captivating feature.

Vision

Imagine a virtual object presented on a transparent 3D volume display that materializes when it is touched by the user. Then imagine the user being able to take the materialized object out of the display. This sounds like a science-fiction dream, but we may not be far from making it reality. This project moves it closer reality by seamlessly connecting virtual images to real objects. The entertainment industry may use this technology to develop new applications for the screen. In games, movies, shows, and other forms of entertainment, objects can emerge from the screen and be transformed into real objects. New forms of marketing and advertisement can also be developed using the Powder Screen. For example, TV ads could feature materialization of displayed claims in the real advertised product. When other technologies are combined with Powder Screen, we are not far from being able to grab products out of a screen while shopping on the net. Imagine that you could throw a ball through your screen to another person in a different location, and the ball would emerge from that person's screen. Imagine yourself communicating with other people around the world not only by text, voice, or image, but also with a sense of being with those people and sharing objects with them. These are just some of this work's future implications.

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Powered Shoes

A locomotion interface using roller skates actuated by two motors with flexible shafts. The device enables users to walk in arbitrary directions in virtual environments while maintaining their positions.

Enhanced Life

It has often been suggested that the best locomotion mechanism for virtual worlds would be walking, and it is well known that the sense of distance or orientation while walking is much better than while riding in a vehicle. However, the proprioceptive feedback of walking is not provided in most virtual environments. Powered Shoes is a revolutionary advance for entertainment and simulation applications, because it provides this proprioceptive feedback.

Goal

To develop a wearable locomotion interface that enables omni directional walking while maintaining the user's position.

Innovations

The major innovation of this work is a new actuation mechanism that cancels the displacement of the walker. Existing locomotion interfaces employ motion floors to create infinite surfaces. Powered Shoes employs active roller skates instead of a motion floor. The skates have three rollers, two of which are connected by a timing belt and driven by a motor. The diameter of each roller is 16mm, the overall height of the mechanism is 20mm, and the overall weight is 700g (the same as hiking shoes). The mechanism allows the user to walk at a pace of 60cm/s.

Vision

Walking is the most intuitive way to move about the real world. Although advanced visual simulation often requires a good sense of locomotion, existing systems do not provide a real sense of walking. Powered Shoes is a practical solution that allows the user to walk naturally. One possible application is an "evacuation simulator." Analysis of evacuation of people during disasters is important for social safety planning. However, it is impossible to carry out experiments with human subjects during an actual disaster. A virtual environment is required for such experiments, and Powered Shoes will be an indispensable interface device for evacuation research. When Powered Shoes is combined with an immersive image display it may provide an ultimate sense of presence that can greatly contribute to teleoperation or virtual travel.

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The Shared Design Space

A novel interface for enhancing face-to-face collaboration using multiple displays and input surfaces. The system supports natural gestures and paper-pen input and overcomes the limitations of using traditional technology in co-located meetings and brainstorming activities.

Enhanced Life

In combination with future tabletop setups, this technique could enhance life in five main areas:

- Science, industry, and education environments (modifying real engineering content, sketching product packaging, etc.)
- Architecture
- Movie industry (brainstorming storyboards, movie sets, etc.)
- Museum edutainment
- Graphic-user-interface design

The project combines a number of diverse technologies to create a unique interface, including:

- A vertical rear-projection surface
- Horizontal tabletop projection
- Integration of multiple devices (laptop and tablet PCs) and a wireless networking setup
- Anoto digital pen and paper
- Computer-vision-based gesture tracking
- Combination and integration of different interaction metaphors (for example, advanced hyper-dragging and intuitive interaction with both the table and whiteboard)

Each of these elements is not unique in itself, but this project combines them in a unique way to create a new collaborative interface with the following key features:

- A common shared workspace
- Support for simultaneous input devices
- Public and private workspaces
- Support for gaze and non-verbal cues
- Non-traditional computer interface metaphors
- Support for the use of real objects

Goals

The primary goal is to use new technology to seamlessly support enhanced face-to-face collaboration and develop a new (non 2D-based) interface for designers, storyboard experts, and creative people. To achieve this, the project focuses on several subgoals:

- Understanding how technology can affect co-located collaboration
- Developing technology for capturing and responding to gesture input
- Developing a software architecture for seamlessly moving digital content between computers and display surfaces
- Developing several interaction metaphors for end-users

Innovations

The system features:

- Easy sharing of data sets. To move notes (sketches, scribbles, etc.) from the laptop to the shared design space of the interactive table, the system uses an advanced hyper-dragging metaphor.
- Direct manipulation on the table. During a session, all participants around the table can quickly re-arrange the content on the table. Images and scribbles can be moved, rotated, and scaled respectively.
- Combination of real and virtual paper with the digital pen, which allows seamless combination of the virtual content with the real world.
- Intuitive interaction with the digital whiteboard. Data sets from the digital whiteboard can easily be moved to the interactive table for further manipulation and vice versa.

Vision

This interface allows users to easily explore design options in a creative context through an intuitive interface of real and virtual artist and designer tools. Using computers in a face-to-face meeting can disrupt the creative process because communication cues can not be shared as easily as in natural face-to-face conversation. The Shared Design Space allows people to communicate as they normally would around a table and enhances this communication with intuitive collaborative tools. This work points to a future where computers will be able to naturally support face-to-face meetings and creative design sessions.

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Submerging Technologies

Sketch: Submerging Technologies, page 112

Three interactive water displays: a tantalizing fountain that withdraws when a hand comes near, a musical harp with water “strings,” and a liquid touchscreen.

Enhanced Life

The displays apply emerging sensing technologies to the medium of water. In each case, the electro-optic properties of the water itself are exploited to make the water a fundamental element of the sensing system.

Goal

To show, somewhat whimsically, how emerging sensing technologies can be applied in unusual ways.

Innovation

The core technical innovation is the use of capacitive and optical sensing techniques in which the fluid itself serves as the sensing element.

Vision

While there are serious industrial applications in coating, painting, and soldering for these sensing technologies, this project focuses on human interaction. The larger point is that as new sensing technologies become available, they can and will be used in very surprising ways to change how we interact with our world.

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Tablescape Plus: Upstanding Tiny Displays on Tabletop Display

Sketch: Tablescape Plus: Upstanding Tiny Displays on Tabletop Display, page 112

A new type of display system for digital kiosks, multiple aspect viewers, and tabletop theater that uses placed objects as projection screens and input devices.

Enhanced Life

Tablescape Plus integrates diverse technologies:

1. Special optics based on material that is normally used for window blinds. The material is used as a horizontal tabletop screen.
2. A unique method of calibrating camera-projector combinations to display images of a horizontal tabletop screen and upstanding objects.
3. The AR Toolkit library detects the position and direction of objects placed on the tabletop. While head-mounted displays are often used in the field of augmented reality, Tabletop Plus does not require any special equipment.
4. Tangible user interfaces to deliver a broad range of interaction.
5. Software architecture for collaborative display of heterogeneous information.

Goals

The overall goal is to increase the availability of physical objects placed on an interactive tabletop display. The project has three subsidiary goals:

1. To develop a display system that can project separate images onto a horizontal tabletop screen and vertically placed tabletop objects simultaneously.
2. To add interactivity to this new display system by introducing camera-based tracking methods and infrared optical systems.
3. To explore the new paradigm of Tablescape Plus applications by developing attractive and specialized demos including games, simulation, education, and scientific visualization.

Innovations

Tablescape Plus represents four key technical innovations:

1. Optical design of a special screen system that is diffusive from one privileged direction and has high transparency to incoming light from other directions. The diffusive direction is used to show images on a tabletop screen. By projecting images from the transparent direction, the system can also project on the surfaces of objects placed vertically.
2. A method for detecting the tabletop objects from inside the system. An infrared camera is installed underneath the table facing upward. Infrared light is projected from the side of the camera to the screen, and a retro-reflective material of a known shape is attached underneath each object. When physical objects are placed, the ID, position, and rotation of each object are recognized by using the ARToolKit library.
3. A method for calibrating projector images geometrically. With this method, each projector can display identical parts of images onto identical positions.
4. A method for harmonizing projected images. Each projected image should change relative to the other images according to the input information of placed objects.

Vision

With Tablescape Plus, the possibilities are unlimited. It could open up new types of tabletop applications for games, simulation, education, and scientific visualization. Because it can use ordinary materials and items, it could provide a variety of new experiences in daily life. It enables future combinations of touch sensors and camera-based hand gesture recognition. The system can be networked for distance interaction. And it could become an infrastructure technology for media art.

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Tangibles at Play

Graphic user interfaces separate intangible representations (pixels) and remote controllers (mouse, keyboard). This alternative approach presents tangible user interfaces that tightly couple representations and controls to take advantage of multimodal human senses and skills to manipulate objects.

Enhanced Life

Tangibles at Play integrates art, design, and education to reveal new perspectives on how we use our hands and peripheral senses to understand information. In contrast to the trend of enhancing and optimizing interactions in a virtual world, this project attempts to design our physical world to help people live simpler lives. The approach is a unique blend of human-computer interaction, design, and media arts that strikes a balance among new enabling technologies, aesthetics, and meaning. Participants experience this blend in two projects: Topobo and I/O Brush.

Goals

To change the painted bits of graphic user interfaces (GUIs) to tangible bits by exploiting the richness of multimodal human senses and skills developed through our lifetimes of interaction with the physical world.

Innovations

The core technical innovation is the project's interface design. By designing the physical and digital aspects of an interface so that the user experience is simple and intuitive, we allow people to focus on the data themselves, instead of the interface.

Vision

People have developed sophisticated skills for sensing and manipulating our physical environments. However, most of these skills are not employed by traditional GUIs. This project builds on the broader range of human skills, by employing metaphors of our existing relationship with physical objects and environments to seamlessly couple the worlds of bits and atoms.

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Tele-Kinesthetic Interaction: Using Hand Muscles to Interact With A Tangible 3D Object

In this tele-kinesthetic interaction environment, users remotely interact with a physical object by moving and straining their hands. The system approximates the hand motions by synthesizing EMG signals.

Enhanced Life

People naturally learn how to move and strain their muscles to properly manipulate objects. This project demonstrates what might happen if we successfully couple the kinesthetic sense with tangible displays as future human-computer-interaction technologies. It combines MyKinSynthesizer and SPIDARmotion. While each of these technologies is unique, their integration is exceptionally rare. No other approach integrates motion and force-sensing systems with a 3D tangiblemotion display.

Goal

To demonstrate a tele-kinesthetic interaction environment.

Innovations

The core technical innovations are in these areas:

1. MyKinSynthesizer, a technology that approximates a user's hand motion and force through a musculo-skeletal model synthesized from EMG signals.
2. SPIDARmotion, an innovative device that displays the motion of a 3D object within a cubic space.
3. Integration of the two technologies to realize a tele-kinesthetic interaction environment.

Vision

This project implies that people can tele-control 3D objects more properly using their body movement and force. It is a starting point for research in tele-kinesthetic interaction, in which people naturally use their kinesthetic skills to interact with physical objects. As this research develops, it will reveal applications in media art, entertainment, education, and scientific simulation.

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True 3D Display Using Laser Plasma in the Air

This display device uses the plasma emission phenomenon near the focal point of focused laser light. By controlling the position of the focal point in the x, y, and z axes, it displays real 3D images constructed by dot arrays in the air.

Enhanced Life

This is the first successful attempt to use laser plasma to display "true 3D images" in a space where there is nothing but air.

Goals

Make laser-produced characters or images for information, amusement, emergency information, or advertising in the sky.

Innovations

Laser-produced plasma in the air is used to create dots that are assembled into true 3D images floating in space.

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U-Tsu-Shi-O-Mi: The Virtual Humanoid You Can Reach

An augmented-reality system that synchronizes a humanoid robot and a virtual avatar. Users experience shaking hands with a computer-graphic avatar.

Enhanced Life

U-Tsu-Shi-O-Mi integrates the sensing and control systems of space robots, the humanoid robot design, mixed-reality systems, and 3D graphics.

Goals

1. To build digital humans that you can touch and talk with.
2. To propose them as novel digital media content that can be merged with many other technologies such as robotics, mixed reality, computer graphics, and artificial intelligence.

Innovations

An integrated sensing and control system has been developed to keep the robot and the avatar motions synchronized during their physical contacts with humans:

- An optical tracker tracks the head movements of the person wearing the head-mounted display.
- The robot has joint-angle and force-detecting sensors.
- The avatar uses the robot's joint-angle sensor data of the robot as its posture control commands.

Vision

This work is a proposal to build a new kind of digital-media content that merges humanoid robots and mixed reality. Thirty years from now, we will be able to buy a sophisticated humanoid robot, overlay the computer graphics of Ichiro, and play baseball with it.

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inter

Virtual Open Heart Surgery: Training Complex Surgical Procedures in Congenital Heart Disease

A new training tool for complex heart surgery. Morphologically accurate models of congenitally malformed hearts were reconstructed from 3D MRI data and integrated in graphical settings representing the surgical environment.

Enhanced Life

This is the first surgical simulator that fully utilizes the GPU to achieve a significant computational speedup. The physical simulation behind the simulator could not have achieved realtime convergence and interactivity by any known CPU approach, due to the size and complexity of heart morphology.

Goals

- The advantages of virtual surgical training are (at least) two-fold:
1. It can illustrate various elements of difficult surgical procedures.
 2. It can allow surgeons to rehearse these elements virtually.

In time, virtual surgery will become a natural supplement to and even replace parts of current surgical training, as training on artificial materials and/or animals in many ways “transfers” unfavorably to real procedures in patients. In the foreseeable future, new tools will take younger surgeons faster and more safely through their inevitable learning curves.

Innovations

The current implementation resolves a volumetric spring-mass based physical simulation entirely on the GPU. The simulation state is visualised by the inner and outer surfaces of the heart in a resolution that is independent of the underlying simulation. Supported gestures include elastic tissue deformation by grabbing, cutting, and suturing with haptic feedback. The simulation achieves an overall frame rate of 30 Hz on a GeForce 7800 GTX when a surface of 135,000 faces is visualized based on deformation of an underlying spring-mass system of 20,000 nodes. In each frame, the physical simulation performs 15 iterations corresponding to 450 iterations per second. Force feedback is likewise provided at 450 Hz.

Vision

Using the GPU as a processor, simulations can now harvest the computational power that is necessary to simulate the deformation of complex morphology in real time. For the first time, surgeons can rehearse open-heart surgery interactively in a virtual environment. As a consequence, an entire new field of surgical education is emerging to help young surgeons accelerate their learning curve for the safety of patients. SIGGRAPH 2006 attendees are invited to test their skills in closing a ventricular septal defect (a hole between the two main chambers of the heart).

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VoodooIO

A new physical interface that can be easily constructed from a collection of basic controls (Voodoo Pins) that are dynamically pinned into and manipulated on an active material.

Enhanced Life

VoodooIO makes the interface flexible by decomposing interactive hardware into atomic interaction units (Voodoo Pins) that can be combined and arranged ad hoc into functional interfaces for computing applications. Voodoo pins are realized as embedded computers that can communicate with a desktop PC via a planar networking substrate, using Pin&Play technology. The Pin&Play infrastructure involves a substrate with embedded conductive layers and custom-designed coaxial connectors that allow the pin computers to affix to the substrate, providing both physical attachment and digital connectivity. Ad hoc networking techniques allow any combination of pins to be dynamically brought in and out of play from the substrate network. A communications protocol provides automatic discovery of network pins, as well as bi-directional communication between pins and the computer. A high-level programming API, configuration tool, and application hooks allow VoodooIO to interface with existing applications. The result is a novel and usable technology with distinct properties that afford unique possibilities in functional interaction and user experience.

Goals

To develop a new type of human-computer interface: a flexible fabric that allows spontaneous provision of physical control to the digital functionality of applications, allowing its physical composition and functionality to be dynamically adapted as an interface that supports the changing requirements and preferences of its users.

Innovations

VoodooIO contributes a novel way for small embedded devices to be practically realized and used as physical interaction components. Major technological considerations with physical toolkits are distribution of power and computation. In this system, the substrate is a centralized power source, implying that devices need not be equipped with batteries. This has significant advantages in terms of reducing device size and eliminating concerns for battery life, while using the substrate as a physical medium for network signals removes the need for costly wireless communication modules. Computation is distributed between devices and central software components, which contributes to the robustness and scalability of the system (the interface remains equally responsive no matter how many pins are connected). The combination of materials used to manufacture the network substrate, as well as the bespoke design of the coaxial connectors, make for a unique way to physically construct the interface. The Pins easily penetrate into the substrate, which holds them fast in place while they are attached, and heals over when they are removed.

Vision

VoodooIO is a flexible fabric for physical-digital interaction, which allows the interface between the user and computer to be easily created and redefined at will. As the trend toward ubiquitous computing continues, and the computer leaves the desktop to become a pervasive resource in our environment, we must constantly rethink the way we interact with such an infrastructure. VoodooIO allows users rather than developers to be creative in this process and decide what they want their particular interface to look, feel, and act like for their particular application needs at a particular point in time.

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act

Locations

Guerilla Studio: Room 52
Guerilla Studio Interactive Classroom: Room 53

Days & Hours

Sunday, 30 July	1 – 6 pm
Monday, 31 July	9 am – 6 pm
Tuesday, 1 August	9 am – 6 pm
Wednesday, 2 August	9 am – 6 pm
Thursday, 3 August	9 am – 5 pm

Guerilla Studio

The Guerilla Studio is an integrated network of machines for realizing ideas in 2D, 3D, 4D, and n-dimensional media, a working computer graphics laboratory for explorations in fine art, animation, science, and other CG disciplines. It features high-end computer workstations, a multitude of software (featuring 2D and 3D design), and print technologies. Artists, scientists, and engineers can walk in, create, and realize their creations right in the lab.

Important Note: Because The Guerilla Studio totally relies upon donations from developers and commercial vendors, we can not guarantee that all technologies offered in previous years will be available at SIGGRAPH 2006.

Special Acknowledgements:

The Guerilla Studio wishes to recognize and thank the Intel Corporation for their extremely generous support.

The Guerilla Studio wishes to recognize and thank Adobe Systems Incorporated for their extremely generous support.

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Pamela Zimmerman

Opening Events

Iterated 69 Sessions

Sunday, 30 July
4:30 pm

Opening Interactive Jam Session
Lead Presenter: Marjan Moghaddam
Presenters: Flavia Sparacino, Adam Caine,
Michael Iannantuono, Richard Hagen

An interactive multimedia performance featuring live music with pre-recorded animations triggered by crowd detection. The piece references the visual language of the VJ culture and the musical sensibilities of noise guitar and art rock, while incorporating audience participation through computer vision in an interactive jam session.

Throughout the week, 2D and 3D artwork from Guerilla Studio attendees will be modified by the performance data and shown alongside some of the original artwork generated during the performance.

Premier Viewing of the Guerilla Studio Documentary

Sunday, 30 July
5:30 pm

During SIGGRAPH 2005, Patricia Clark and her audio/visual team spent the week filming and documenting the rich history of people, events, stories, and technologies that make up the Guerilla Studio. Their documentary answers many frequently asked questions, including: How and when did the Guerilla Studio get started? What is the Guerilla Studio? Why is it unique and special to SIGGRAPH and conference attendees? Who are the people who create the magic that is the Guerilla Studio?

New for SIGGRAPH 2006

Interactive Classroom

The Guerilla Studio Interactive Classroom offers a wide selection of workshops, tutorials, and lectures. Some systems are available for attendees to share and work on throughout the sessions, but attendees are also invited to bring their own laptops. Direct participation is not required. Everyone is invited to observe and acquire valuable information from our team of experts. Classroom space is limited. Space is available on a first-come, first-served basis. A queue line will begin 20 minutes prior to the workshops, lectures, and demonstrations.

Motion Capture

PhaseSpace offers an enlightening interactive experience to attendees who want to learn more about motion capture. Sign up in the Guerilla Studio for 15 minutes of time in their portable studio, put on a set of active LED markers, move, and then take your own motion capture data with you.

3D

The Guerilla Studio is accepting 3D stl files for pre-conference printing and display at the conference on a first-come, first-served basis. Guerilla Studio 3D specialists will determine the best printing process for your project. Your 3D print will be available for pick-up at the end of the conference.

Tangible User Interface

Attendees can use a Polhemus stylus digitizer, linked to a physical 12-inch x 12-inch RP panel, to navigate and control a hyperlinked 3D model of downtown Phoenix. Interact with a 3D projection of Phoenix (and other regions as they come on line) on the wall of the 3D area.

Juried and Curated Special Projects

The Guerilla Studio has five special projects and two workshops that were accepted from the first official Call for Participation in several years. Several additional projects and workshops were curated into the Guerilla Studio. Please review the Special Projects and Workshops sections for more information on the artists, projects, and workshops.

Animation

The TeraGrid is a computing infrastructure combining high-performance computers, data resources and tools, and high-end experimental facilities around the country. Combined, the TeraGrid sites provide more than 102 teraflops of computing capability and more than 15 petabytes of online and archival data storage, including over 100 discipline-specific databases. Attendees can learn how to access and use Purdue University's TeraDRE, a TeraGrid distributed rendering environment with over 2,000 render nodes.

Laura Arns

John Moreland

Envision Center for Data Perceptualization
Purdue University

Janett Tillotson

Preston Smith

Rosen Center for Advanced Computing
Purdue University

International Projects Area

Join Lyn Bishop and others for a live connection to Bangalore, India each morning at 9 am, or drop in anytime to learn more about how you can participate in the International Collaboration.

Technologies and Creative Areas

See each area for scheduled daily events.

2D Area - Guerilla Editions

Area Chief: Karl Lang

The 2D area is the heart of the Guerilla Studio. Images are received via our high-speed network and made into fine-art pigment prints on the best papers with pigment inks that resist fading for over 120 years under proper display conditions. Master printmakers and even a color scientist manage all aspects of the color workflow and printing. The latest technologies for Epson, X-Rite, Gretag-Macbeth, Hahnemühle, Colorbyte, and others are used to produce museum-quality prints. If you have questions about color management, calibration, file prep, or image permanence, ask someone in the 2D area.

The Guerilla Studio is committed to accommodating as many attendees as possible. Due to extremely high demand for 2D printing, please observe our new policy for the 2D Area: two prints per attendee.

**2D printing signup times: 1 - 4 pm Sunday,
9 am - noon and 1 - 4 pm Monday - Wednesday.**

3D Area

Area Chief: Dan Collins

The Guerilla Studio is accepting 3D .stl files for pre-conference printing and display at the conference on a first-come, first-served basis. Guerilla Studio 3D specialists will determine the best printing process for your project. Your 3D print will be available for pick-up at the end of the conference.

Submit your files to: siggraph.alti.asu.edu/cgi-bin/WebObjects/Siggraph

The system will generate a personal "artist web site" when you upload your first file. You can tag your files for public or private consumption. If you want thumbnails linked to your projects, upload full size .jpgs, .gifs, or .pngs, and thumbnail versions of these source images will be autogenerated and dropped into your artist web site. Most popular file formats can be used, and, best of all, there is no limitation on file size (although you will be timed out after several minutes).

The 3D Area pre-printed a selection of 3D stereolithography (.stl) files. If you submitted a file to the 3D Production Pipeline and Archive before SIGGRAPH 2006, please check the status of your work at the 3D Area. It could already be on display in the Guerilla Studio.

Hosted by Arizona State University, this system is being developed by the Applied Learning and Technology Institute (alt^I) to provide continuity with future Guerilla Studios and a platform for further development in data management and archiving.

Your comments are most welcome.
Contact dan.collins@asu.edu

**3D printing signup times: 1 - 4 pm Sunday,
9 am - noon and 1 - 4 pm Monday - Wednesday.**

Technologies and Creative Areas

See each area for scheduled daily events.

3D Area (continued)

3D Data Capture

The 3D Area features an array of 3D scanning devices. Bring in an object to be scanned, scan your self, or sculpt an object out of clay and scan that. Once an object has been scanned and converted into a digital model (usually an .stl file), that file can be imported into 3D modeling applications to enable further cleanup or manipulation (cut, scaled, twisted, bent, combined with other models, etc.). Then the model can be output to a rapid-prototyping machine as a "stereolithography" file (.stl), going full circle to again become a physical 3D object, animated with 3D animation software, or shaded, textured, rendered, and printed as a 2D image.

3D Modeling

Almost any form, real or imagined, can be generated using 3D modeling applications. The excitement is in the realization that you are actually drawing in three dimensions, where objects (or whole environments) can be viewed from any point of view and quickly moved, scaled, or more dramatically altered for more dynamic and intuitive creative exploration. A completed model can be output to a rapid-prototyping machine, animated with 3D animation software, or shaded, textured, rendered, and printed as a 2D image.

Rapid Prototyping

Rapid prototyping (RP), or 3D printing, is an elegant and fairly simple set of manufacturing processes. Any CAD model that has wall thickness or is a "watertight solid" can be prototyped. RP was originally developed and used in aerospace, automotive, toy, and medical applications, but it has gained wide acceptance in the arts, architecture, jewelry, and other areas. The simple yet profound difference between additive rapid prototyping and subtractive modeling technologies such as CNC or laser cutting is that undercuts, convolutions, nested forms, and very intricate geometries in any direction can all be accomplished in a single part.

Animation Area

Area Chief: Gene Cooper

Explore a broad range of hands-on processes, hardware systems, and software packages in the Animation Area. Attendees can learn about, explore, and create animations on the spot using very high-tech systems and software as well as low-tech systems and techniques used by early animators and inventors. Introduce yourself to various off-the-shelf commercial animation software packages and general interface, workflow, and creation tools via hands-on sessions and interactive tutorial presentations.

Station signup times: 1 - 4 pm Sunday, 9 am - noon and 1 - 4 pm Monday - Wednesday, 9 am - noon Thursday.

New This Year

The TeraGrid is a computing infrastructure combining high-performance computers, data resources and tools, and high-end experimental facilities around the country. Combined, the TeraGrid sites provide more than 102 teraflops of computing capability and more

than 15 petabytes of online and archival data storage, including over 100 discipline-specific databases. Attendees can learn how to access and use Purdue University's TeraDRE, a TeraGrid distributed rendering environment with over 2,000 render nodes.

**Laura Arns
John Moreland**

Envision Center for Data Perceptualization,
Purdue University

**Jenett Tillotson
Preston Smith**

Rosen Center for Advanced Computing,
Purdue University

Polhemus Latus Body-Tracking System

The Polhemus LIBERTY LATUS provides truly wireless tracking. There are no wires; each marker is self-contained. The system is capable of tracking up to 12 markers for full six-degree-of-freedom solutions over large areas. Each marker is tracked in space by a receptor that covers up to an eight-foot (2.44m) diameter. Each system is capable of connecting up to 16 receptors for total coverage of hundreds of square feet. Systems may also be concatenated for even larger area coverage. All wireless communication is via a proprietary magnetic data link so the system does not suffer from the occlusion problems associated with camera-based motion tracking systems.

Audio/Video Area

Area Chiefs: Byron Lahey and Patricia Clark

Audio technologies support an experimental, interactive media studio with an emphasis on creation and application of prototype instruments using a variety of sensor technologies and custom software. Attendees are invited to interact with and make audio recordings using existing sensor and software combinations or explore the creative tools further by assembling their own. These systems will be directly linked to the systems of the video area, allowing live, collaborative audio-video performances to be staged and recorded.

Demos: Monday - Thursday

Noon: Final Cut Pro hands-on demo

3 pm: Isadora: digital mixing/switching hands-on demo

Collaboration Area

Area Chief: Kathy Beal

The Collaboration Area is a place to play and explore your creativity with small print projects. Various projects are available to turn your images into collectibles; hand-bound folding books, note cards, and calendars. Use our cache of art supplies to further enhance and personalize your project.

CyberFashion Area

Area Chief: Isa Gordon

This year, instead of staging an event, the CyberFashion Area presents a series of workshops on wearable technology:

**Smart Fabrics
Joanna Berzowska**

XS Labs and Concordia University

Marcelo Coelho

XS Labs

Circuit Building & Bending Aesthetics & Meaning

**Matt Kenyon
Doug Easterl**
y S.W.A.M.P

Basic Electronics

Janet Hansen
Enlighted Designs

DIY Wearables

Greg Priest Dorman
Vassar College

The Guerilla Studio also presents sessions on the general field of CyberFashion, the state of the art in wearable computers, and the future of lighted clothing.

International Projects Area

Area Chief: Lyn Bishop

In this relatively new area, attendees share collaboration, cultural exchange, and cooperative art making. Artists and attendees collaborate, in real time, on networked projects with students in Bangalore, India. The live connection begins each day at 9 am. Everyone is invited to drop in anytime to learn more about participating in the International Collaboration.

Lenticular Printing Area

Area Chiefs: Raleigh Souther, Helena Pasquarella, Chris Williams

Create spectacular 3D lenticular effects with lenticular training from Chris Williams (Adventure Gaming) and Raleigh Souther (Get Flipped!, Inc.). They show how to create 3D depth in any 2D images, explore the process of mastering any file for a full 3D or animated lenticular effect, and help attendees produce a finished lenticular 3D image. Attendees can also use Get Flipped! Pro Studio software to experience a 3D environment and an actual 3D lenticular image capture.

Daily signups (15 minutes or two hours):

1 - 6 pm Sunday, 9 am - noon and 1 - 6 pm Monday - Wednesday, 9 am - 5 pm Thursday.

Motion Capture Area

Area Chiefs: Tracy McSheery, Charles Luther

PhaseSpace Inc. is demonstrating the latest two-person, real-time, high-resolution, optical motion-capture technology. Dancers, performers, martial artists, and actors can capture their motion on standard characters, and character artists can perform and capture motion with their own characters.

New This Year

Sign up for 15 minutes of time in the PhaseSpace portable studio, put on a set of active LED markers, move, and then take your own motion capture data with you.

Sign up in the Guerilla Studio.

Special Projects

Soma: Physical Media Meditation

Daily Yoga & Meditation Sessions
Sunday - Thursday in the Guerilla Studio

Presenters: Heather Raikes, Genessa Krasnow

Twenty-minute immersive media yoga sessions and ambient meditation zones create a sanctuary for the integration of body and mind. Soma, a word connoting both physical body and ritual offering, explores new dimensions of physical experience while bringing opportunities for yoga practice, deep breathing, meditation, creative contemplation, and energetic rejuvenation to SIGGRAPH 2006 attendees. Wear your conference clothes for 20-minute yoga sessions and/or or 20-minute meditation zones. Wear your yoga gear for a 60-minute class every afternoon (mats will be provided).

Soma also invites attendees to generate thematic imagery, sound, and video for inclusion in the Guerilla Studio Meditation Stream, which will develop throughout the conference week.

Enter the Graffiti Research Lab

Sunday - Thursday in the Guerilla Studio

Presenters: James Powderly, Evan Roth

The Graffiti Research Lab demonstrates technologies that combine the aesthetic and intent of street art with DIY electronics, graphics software, digital fabrication tools, and the internet. Workshop participants contribute to creation of a geek mural that will redefine a public space at the conference.

This is an incredible opportunity to work with a dynamic and exciting group of artists who are presenting their work at events all over the United States. However, due to the cost of the materials involved in offering this workshop, the artists may need to charge a reasonable materials fee. Participants will take home the materials they purchase and the work they create for this project.

Interactive Holographic Window

Sunday - Thursday in the Guerilla Studio

Presenter: Flavia Sparacino

Flavia Sparacino from Sensing Places, a spinoff from the MIT Media Lab, captures 3D photographs and videos and simultaneously transforms them into holo-portraits and holo-landscapes, and displays them on a commercial auto-stereo display.

Attendees inside the Guerilla Studio use the display to interact with people outside, through the Interactive Holographic Window. Potential additional outcomes include 3D printing and texturing of the 3D photographs, and, in some instances, creation of interactive, responsive holo-portraits of the participants.

Painterly Rendering With Designed Imperfection

Sunday - Thursday in the Guerilla Studio

Presenter: Jin Wan Park

Digital rendering of attendee portraits that resemble traditional paintings. The process is displayed in real time on a 50-inch PDP monitor, and the output is printed to paper via color inkjet and provided to the subject.

This project, supported by the Korean Ministry of Information and Communication, represents more than implementation of a tool for creation of painterly rendering; it is the result of ongoing scientific research. A collection of artists and scientists from Chung-Ang University and the Electronics and Telecommunications Research Institute formed a research team with the goal of simulating a representational painting style that achieves human-like imperfection.

Recontextualize Your Online Avatar With OGLE (OpenGLExtractor) and a 3D Printer or Google Earth

Sunday - Thursday in the Guerilla Studio

Lead Presenter: Michael Frumin

Presenter: Rob O'Neill

Eyebeam's Open Lab publishes the open-source software package OGLE (OpenGLExtractor) for capturing 3D geometries from applications using OpenGL. With OGLE, attendees can capture 3D geometries of avatars and other forms from a variety of video games. The captures will be fabricated with 3D-printers, exported into GoogleEarth, or saved for use in other applications.

The Iterated 69 Sessions

Sunday, 4:30 pm: Opening Interactive Jam Session
Sunday - Thursday in the Guerilla Studio

Lead Presenter: Marjan Moghaddam

Presenters: Flavia Sparacino, Adam Caine, Michael Iannantuono, Richard Hagen

An interactive multimedia performance featuring live music with pre-recorded animations triggered by crowd detection. The piece references the visual language of the VJ culture and the musical sensibilities of noise guitar and art rock, while incorporating audience participation through computer vision in an interactive jam session. Throughout the week, 2D and 3D artwork from Guerilla Studio attendees will be modified by the performance data and shown alongside some of the original artwork generated during the performance.

Workshops

Soft Computation and Physical Interaction Workshop

Monday, 31 July, 9 am - 6 pm
CyberFashion Area

The field of electronic textiles (also called "smart fabrics") is quite fashionable right now.

On one end of the spectrum, there are pragmatic applications such as military research into interactive camouflage or textiles with nanobots that can heal wounded soldiers. On the other end of the spectrum, artists and designers are working in the area of reactive clothes: "second skins" that can adapt to the environment and to the wearers; express aspects of wearers' personalities, needs, and desires; and represent aggregate social information.

This one-day workshop introduces participants to the idea of electronic textiles and to the principles of soft-circuit design through hands-on demos and experimentation. Each attendee will build a squeezable "soft switch" (a simple interactive textile with stitched sensors and beaded components).

This is an exceptional opportunity to work with Joanna Berzowska, an internationally renowned artist in the field of electronic textiles, and her team from XS Labs. However, due to the cost of the materials involved in offering this workshop, the artists may need to charge a reasonable materials fee for participating in the workshop. Participants will take home the work they create in this workshop!

Sign-up available Sunday, 30 July, 1 pm

Presenters:
Joanna Berzowska
XS Labs and Concordia University

Marcelo Coelho
XS Labs

Pod Casting Workshops

Sunday, 30 July - Tuesday, 1 August
Interactive Classroom

The Pod Casting workshops explore various approaches for developing and creating content for podcasts:

Recordings of Place: Creating a Memoir of a Location

Sunday, 30 July, 1 - 2 pm

Presenter: Cynthia Beth Rubin

From Atget's Paris, photographs of architectural details, interior spaces, and broad exterior views, generally without people. Emphasis is on the spirit of the cityscapes as drama.

Podcasting Emptiness Into a Sea of Fullness, Yearning for a Moment of Rest

Monday, 31 July, 9:30 - 10:30 am

Presenter: Daniel Peltz

Designing a silent intervention: Free writing, based on a series of prompts, to further clarify the quality of the silence you're interested in finding or creating. Find or make a pocket of silent darkness somewhere in SIGGRAPH 2006. Format your silent darkness for podcast.

Drawing From Memory; Drawing Into the Computer

Monday, 31 July, 2 - 3 pm

Presenter: Copper Frances Giloth

A demonstration of using a podcast as a slide show that appears to be animated, because it is made up of a series of related images. Users input images and then, working together on the compiling process, add visual effects.

Captain's Log: SIGGRAPH as Experience

Tuesday, 1 August, 9:30 - 10:30 am

Presenter: Jim Demmers

How can we go beyond ordinary reporting? How can we use the interviewing process as a vehicle to further social interactions and understanding among people with divergent cultural experiences?

Participants begin by answering seven questions to determine their cultural experience: age group, gender, region or country, language(s) their great grandparents spoke as their first language, the continent their ancestors came from, political identification, area of computer graphics. Then 30-second video interviews are conducted with SIGGRAPH 2006 attendees who provide different answers to at least four of the questions on cultural experience. The focus of the interviews is their experience at the conference. Workshop participants will then edit and compile the interviews as podcasts.

Change the World in Five Minutes

Tuesday, 1 August, 2 - 3 pm

Presenter: Colette Gaiter

A demonstration of using a podcast to elicit responses, then making a new video podcast and updating it periodically after collecting video stories from conference attendees. This project involves users in the round trip of a podcast as a generator and recorder of responses within a relatively short period of time.

Interactive Documentary Workshop

Monday, 31 July - Tuesday, 1 August,
11:30 am - 1 pm and 4 - 5:30 pm;
Wednesday, 2 August, 10:30 am - noon
Interactive Classroom

Lead Presenter: Steve Anderson

Presenters: Holly Willis, Eric Gordon, Erin O'Brien

This hands-on workshop introduces attendees to the art and technique of designing interactive documentaries for publication on DVD or the web. Each attendee will leave the session with a working interactive documentary and the ability to add features or create new projects using free, downloadable software. Bring your own Quicktime files or work with media that will be provided.

Photoshop Workshops

Beginning level: Monday, 31 July, 10:30 am;
Tuesday, 1 August, 3 pm; Thursday, 3 August, 9 am
Intermediate level: Monday, 31 July, 3 pm;
Wednesday, 2 August, 9:30 am;
Thursday, 3 August, 1 pm
Advanced level: Tuesday, 1 August, 10:30 am;
Wednesday, 2 August, 2 pm
Interactive Classroom

Presenter: Steven Burns

Wet Transfer Workshop With Dorothy Simpson Krause

Tuesday, 1 August, 2 - 3 pm
Collaboration Area

In this workshop, Dorothy Simpson Krause discusses and deconstructs the process of making a wet transfer from digital source materials, and leads attendees through the process of creating their own digital transfers.

Dorothy Simpson Krause is a painter, collage artist, and printmaker who incorporates digital mixed media into her art. Her work is exhibited regularly in galleries and museums and featured in numerous periodicals and books. She is professor emerita at Massachusetts College of Art, where she founded the Computer Arts Center, and a member of Digital Atelier, an artists collaborative, with Bonny Lhotka and Karin Schminke. She is also the co-author, with Lhotka and Schminke, of *Digital Art Studio: Techniques for Combining Inkjet Printing with Traditional Art Materials*, Watson-Guptill, 2004.

Interactive Classroom Schedule

Classroom space is limited. Space is available on a first-come, first-served basis. A queue line begins 20 minutes prior to the workshops, lectures, and demonstrations.

Sunday, 30 July

Podcast Workshop: Recordings of Place: Creating a Memoir Location
Cynthia Beth Rubin
1 - 2 pm

3D Workshop: Digital Sculpture Overview
2 - 3 pm

3D Workshop: Maya 3D Modeling Overview
3 - 4 pm

3D Workshop: 3D Tangible User Interface Demo
4 - 5 pm

3D Data Capture: Cyberware Laser Scanning Demo
5 - 6 pm

Monday, 31 July

Animation Workshop: Introduction to Distributed Rendering Using the TeraGrid
9 - 9:30 am

Podcast Workshop: Podcasting Emptiness Into a Sea of Fullness, Yearning for a Moment of Rest
Daniel Peltz
9:30 - 10:30 am

Steven Burns Photoshop Workshop (Beginning)
10:30 - 11:30 am

Interactive Documentary Workshop
11:30 am - 1 pm

Animation Workshop: Introduction to Stop-Motion Animation
1 - 1:45 pm

Podcast Workshop: Drawing From Memory; Drawing Into the Computer
Copper Giloith
2 - 3 pm

Steven Burns Photoshop Workshop (Intermediate)
3 - 4 pm

Interactive Documentary Workshop
4 - 5:30 pm

3D Workshop: Preparing 3D Models for RP
5:30 - 6 pm

Tuesday, 1 August

Animation Workshop: Introduction to Distributed Rendering Using the TeraGrid
9 - 9:30 am

Podcast Workshop: Captain's Log: SIGGRAPH as Cross-Cultural Experience
Jim Demmers
9:30 - 10:30 am

Steven Burns Photoshop Workshop (Advanced)
10:30 - 11:30 am

Interactive Documentary Workshop
11:30 am - 1 pm

Animation Workshop: Creating Low Tech Zoetropes and Animations With High Tech Tools
1 - 1:45 pm

Podcast Workshop: Change the World in Five Minutes
Colette Gaiter
2 - 3 pm

Steven Burns Photoshop Workshop (Beginning)
3 - 4 pm

Interactive Documentary Workshop
4 - 5:30 pm

3D Workshop: Simple But Rewarding Animation Techniques for Maya and XSI
5:30 - 6:15 pm

Wednesday, 2 August

Animation Workshop: Introduction to Distributed Rendering Using the TeraGrid
9 - 9:30 am

Steven Burns Photoshop Workshop (Intermediate)
9:30 - 10:30 am

Interactive Documentary Workshop
10:30 am - noon

3D Data Capture: Minolta Scanning Demo
noon - 1 pm

Animation Workshop: Tools and Techniques for Panoramic VR Applications
1 - 2 pm

Steven Burns Photoshop Workshop (Advanced)
2 - 3 pm

Animation Workshop: Using Mel-Scripting to Import Data Into Maya
4 - 4:45 pm

Video Workshop: Motion Graphics and Compositing
5 - 6 pm

Thursday, 3 August

Steven Burns Photoshop Workshop (Beginning)
9 - 10 am

3D Workshop: 3D Data Capture Overview
10 - 11 am

3D Workshop: Maya 3D Modeling Overview
11 am - noon

Steven Burns Photoshop Workshop (Intermediate)
1 - 2 pm

3D Workshop: CAD/CAM Jewelry Lecture
2 - 3 pm

3D Workshop: Open Discussion on Digital Sculpture (Assembled Artists)
3 - 4 pm

3D Modeling: Rhino 3D Modeling Overview
4 - 5 pm

Presentations & Events

To sign up for these presentations and events, please inquire at the Guerilla Studio front desk. All signups and activities are on a first-come, first-served basis.

Visit the Guerilla Studio web page for a detailed schedule of the daily events and presentations, www.siggraph.org/s2006

Location

Hall B Lobby

Days & Hours

Saturday, 29 July

Sunday, 30 July

Monday, 31 July

Tuesday, 1 August

Wednesday, 2 August

Thursday, 3 August

6 – 8 pm

8 am – 6 pm

8 am – 6 pm

8 am – 6 pm

8 am – 6 pm

8 am – 5 pm

The Teapot Exhibit

intertwingle with real teapots, virtual teapots, and teapot-inspired images that showcase the long association of the teapot with computer graphics, art, and Boston. The teapot exhibit includes juried and curated work by computer scientists, artists, and designers from around the world.

Committee

Marc J. Barr

Teapot Exhibit Chair

Middle Tennessee State University

Sonny Kamm

Kamm Teapot Foundation

Guanping Aheng

Middle Tennessee State University

Teapot Exhibit Talks

Tuesday, 1 August**Location: International Center/Hall B Lobby**

3 - 3:30 pm

The Teapot Through the Ages

The canonical teapot was modeled over 30 years ago by Martin Newell at the University of Utah. This talk examines how this simple geometric model became a graphics icon and shows some of the many images made of the teapot over the years, as well as the variants of the model that have been made.

Peter Shirley

University of Utah

shirley@cs.utah.edu

3:30 - 4 pm

Enjoying the World's Most Popular Beverage

Apart from water, tea is the most popular beverage in the world. This talk looks at the nature of tea and its history, manufacture, and enjoyment.

Frank Sanchez

Upton Tea Imports

4 - 5 pm

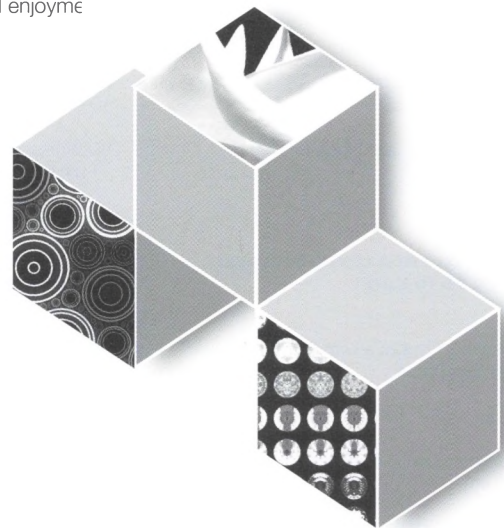
Tea-Time

Meet Frank Sanchez and ask questions about the international culture of tea drinking. Upton Tea Imports will be distributing samples of their products.

Marc J. Barr

Middle Tennessee State University

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1630

A cylindrical catoptric anamorphic image, combining a diagram from Vaulezard's work with a distortion of the Utah teapot. Through the process itself, straight lines of light unfold in curves, in a shape that resembles the teapot in its minimalist wireframe representation.

In 1630, the year Boston was founded, Jean-Louis Sieur de Vaulezard published his "Perspective cilindrique et conique, ou Traicté des apparences veuës par le moyen des miroirs cilindriques et cōniques, soient convexes ou concaves" (Cylindrical and conical perspective, or treatise on appearances seen using cylindrical and conical mirrors, either convex or concave). It proposed the first known geometric (we would now call it ray-traced) solution to the construction of catoptric anamorphosis images. Such images had been popular in Europe for more than a decade, and were also known in China. It has been conjectured that, as tea, they were introduced to Europe from China. Before Vaulezard, catoptric anamorphosis was realized using polar-grid approximations, or by painting while looking through a mirror.

Contemporary lectures on catoptric anamorphosis often relate it to a juncture point between art and science, or mathematics, where computer graphics is often located. Even in a media-rich era, this geometric optical transformation continues to fascinate. The iconic Utah teapot appeared in the 1976 paper describing reflection mechanism and texture mapping. Figure 5 of that paper showed the cylindrical anamorphosis of a photograph as an illustration of the power of the technique.

In this work, while the cylindrical mirror reveals the original image, the anisotropic scaling of the diagram's pixels induced by the mapping emphasizes the discrete nature of the image.

Contact
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30th Anniversary Teapot 1

The year 2006 marks the 30th anniversary of my pioneering efforts in the field of digital media. Having participated in early SIGGRAPH conferences from 1983 on, along with the Pioneers Exhibition in Orlando in 1998, I felt it was important to create an iconic image.

The teapot has been near and dear to most of us early digital creators as we struggled through some of the difficulties of massaging technology. This work symbolizes that tension and shows where we are today, where just about anything is possible. Now, for sure, we are only limited by our imagination. It wasn't always that way.

I photographed a teapot that has been a family heirloom for more than 75 years to create a very dense collage of personal imagery. As background imagery, I added pictures created from my Nuvo Japonica Series, produced in 1989. Those images were captured from a video monitor, so they have the texture of the screen. Through multiple layers in Photoshop CS, I added colors to create lighting techniques. Going back and forth through the layers, I was able to get the jagged "cut" look of paper to add to the tension of the work. The final piece was printed on a DesignJet 130nr for brilliant color and final rendition.

Contact
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2D Origami Teapot With Diagram

The 2D origami teapot is folded from one piece of square paper. The model can be folded by anyone interested in origami, yet it keeps the proportions of the Utah teapot unchanged.

The teacup is also folded from one piece of square paper (both pot and cup).

Technical Overview

The configuration of the origami model was modeled by simulating rigid origami, which is origami represented as rigid polygons linked to each other with hinges on crease lines. Forward kinematics of the multi-vertex origami was calculated by combining single-vertex constraint equations by Belcastro and Hull.¹

Contact
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1. Sarah-Marie Belcastro & Thomas C. Hull. 2002. A mathematical model for non-flat origami. Proceedings of the 3rd International Meeting of Origami Mathematics, Science, and Education.

3D Origami Teapot

An origami teapot folded from one piece of square paper. As far as I know, this is the first attempt in the world to make a three-dimensional origami Utah teapot.

The model was manually constructed from a triangulated version of the Utah teapot to prove the original algorithm to convert a polygonal manifold into an origami crease pattern.

Technical Overview

No cutting was needed to make the 3D model from the crease pattern, so this approach is different from the method for making papercraft proposed by Mitani et al. (SIGGRAPH 2004), which requires cutting the sheet of paper into a number of non-convex parts. The original "origamizing" algorithm results in a totally zero-gaussian-curvature surface which is on and enveloped by the desired three-dimensional surface. The idea is based on aligning polygons on a plane, so that "tucking" of the blank area around the polygons is possible.

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A Terribly Scratched Teapot

A terribly scratched teapot is a piece of scratched flat sheet. When the sheet is illuminated, a teapot appears, and observers perceive a three-dimensional surface as the specular reflection changes.

This “scratched 3D” technique creates a three-dimensional appearance on nearly flat sheets such as plastic films. It generates anisotropic reflection by forming scratches that refer to three-dimensional information modeled in the manner of computer graphics. The result is a three-dimensional appearance in arbitrary curved surfaces on real-world surfaces without holography or lenticular technology.

Technical Overview

A terribly scratched teapot was modeled as an ordinary teapot. The Z-buffer of the teapot was taken instead of RGB color channels in the rendering process and transformed into a gradient field in the diagonal direction. Then several small curved lines were drawn using a method called “hedge hog illustration” that makes each curved line follow the direction defined at each position of the gradient field. The binary image of curved lines was substantiated as scratches on a metal plate using a photo-engraving plate-making system. Copies that reproduce the 3D appearance can be easily made with an embossing process.

Contact

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Aggregated Teapot

This teapot, originally created for a SIGGRAPH 2005 Sketch, is part of the Aggregation series: a set of digitally generated sculptural forms that study the incredible intricacy of organic natural forms.

The Aggregated Teapot demonstrates how the rules used to generate an aggregated structure can be directed toward a targeted goal.

Influenced by the work of D’Arcy Thompson, Alan Turing, and Ernst Haeckel, the images in the series examine how the forms of plant and coral-like structures can be created by digital simulation of flow and deposition. Sculptural shapes are created by a process of accretion over time, gradually grown by simulating the paths of millions of particles randomly flowing in a fluid field. Over time, they build on top of an initial simple seed surface to produce structures of immense complexity.

Technical Overview

The base algorithms used to generate images from the Aggregation series are variations on diffusion limited aggregation. Different structures are produced by introducing biases and changes to the rules for particle emission, motion, and deposition. The growth-like nature of the process, repeatedly aggregating on top of the currently deposited system, produces reinforcement of deviations caused by small forces applied to the undeposited particles as they randomly move. This means that small biases to the rules and conditions for growth can produce great changes to the final form.

The rendered structures are implicit surfaces composed of many millions of particles. Simulations can run for many days or even weeks. The Aggregated Teapot is composed of nearly 58,000,000 particle primitives. All the software used to simulate the structures and render the final images was written by the artist in Visual C++.

Contact

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Alphabet Word Gestures

I make stories based on objects and their descriptive words and associated processes.

When thinking about the history of the teapot in relation to computer graphics, I became intrigued with the history of the teapot. After learning some of the vocabulary to describe teapots and tea, I began to look at the vocabulary used in the field of computer graphics. After reviewing computer graphics glossaries and SIGGRAPH technical and art journals from 1977 through 2005 I eventually compiled a list of 1,243 computer and computer graphics terms. My list of teapot, tea, and ceramic-construction terms came in at 231.

This series of images is formed from my visually playing and ordering those 1,474 words.

Technical Overview

These images were made with off-the shelf software and hardware and lots of words from numerous technical journals and dictionaries.

Contact

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Amazing Portrait [al la prima]: Process of Drawing Teapot

There are many kinds of people in the world. And teapots also have many usages.

This paint rendering was done with a rough al la prima oil painting. As if a painter was creating a painting. This is an amazing portrait of a teapot. It follows the order that a painter uses to paint a picture. The computer draws the image from an original photograph. It reveals the texture of the oil colors and the shape of the brush.

Technical Overview

Painterly rendering may generate various results depending on the parameters that determine brush-stroke characteristics, such as, color, orientation, size, shape, and textures. In this work, manual oil-painting effects were created by applying the most appropriate brush strokes in the source images. Emulation of brush strokes with dynamic properties was achieved with a brush orientation that surrounds the edges by referring to the edge orientation of source images. The sizes were determined by the different sizes of the objects, from wide to narrow brushes. Line and spline curve shapes were applied to simulate curves and swirls, and to express texture effects using the two brush textures.

Contact

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inter

Animated Embroidery: A Teapot in Modern Blackwork

An exploration of new domains of computer graphics through uncommon media, pushing the bounds of non-photorealistic rendering (NPR). This work uses NPR methods to move beyond the common pen-and-ink or impressionist oil painting styles.

It implements computer-generated blackwork, a decorative art of embroidery that originated in Elizabethan times, to add detail to clothing. The basic techniques of blackwork were later used as an illustrative form, and the technique was revived in the mid-20th century. This work adapts the approach to computer graphics and shows how iconic objects such as the Utah teapot (and the less-well-known teacup) can be rendered anew using vintage media. It adds a very uncommon twist: animating embroidery, a medium that does not lend itself to moving images.

This modern interpretation renders polygonal objects using computer graphics techniques and uses computer-controlled embroidery machines to translate them to embroidered panels. Using the venerable Utah teapot as the subject for a still life connects a tradition in the field of computer graphics to a centuries-old art form.

Technical Overview

Blackwork is characterized by the use of straight stitches on a contrasting color fabric, most commonly black thread on white linen. Traditional blackwork can be seen in Elizabethan period paintings in the form of edgings along cuffs and collars, as well as broader areas embellished with figures filled with intricate patterns. More modern interpretations of blackwork, beginning around 1950, use repeating fill patterns to create representational images from the contrasting lights and darks. The effect of this more modern blackwork resembles that of a pen-and-ink drawing using very elaborate hatching patterns, where the sum of strokes in a region produces a target tone.

Translated into modern computer graphics, 3D polygonal shapes are rendered, not as pixels to be transferred to colored stitches, but as individual strokes of dark thread on a light cloth field. The process is not image-based. It generates the directives from a graphics pipeline employing common tools for shading and illumination and hidden surface removal. Ultimately, however, scan conversion is transformed into stitch placement, and the result is a control file for an automated embroidery machine.

The Utah teapot is used here as a subject for a “not-so-still life,” connecting a traditional icon of computer graphics to an ages-old decorative craft formerly used to embellish the garments of royalty. In a new spin on this medium, the representation is animated using a rudimentary scene graph that creates a short loop sequence of 12 panels mounted on a zoetrope, a primitive viewer for moving images, which animates blackwork for perhaps the first time.

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Collaborators
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David T. Chen
Marc Olano
Bradley Lowekamp

Boston Skyline, Rendered With Teapots

While mulling over several ideas for teapot-related artwork, I had a flash of inspiration: “I’ll just use teapots themselves as render primitives!” Over 466,000 teapots were used to represent this aerial view of Boston, my tribute to the city.

Technical Overview

Custom software was written by the artist in C++ and Perl on a Macintosh to create this image.

The elements used to build the image were a high-resolution photograph of the Boston skyline, and 211 unique digital teapot images. Each teapot image was rotated by five-degree increments, resulting in 72 images for each original teapot.

An iterative process was used to create the scene. For each iteration, a random location was chosen on the photograph. Every teapot image was compared against its “footprint” on the photograph at that location and given a value that corresponded to how closely it matched the underlying image. The one that most closely matched was considered a candidate for placement on an initially blank “canvas” image.

A second value was computed to represent how completely the candidate teapot would cover previously placed teapots. The two values were combined, and, if they met a pre-defined metric, the program painted the teapot onto the canvas; otherwise, it was rejected and nothing was done for the current iteration.

For this image, the program ran through 625,000 iterations, which placed 466,961 teapots.

Contact
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minggle

Coming Together/Coming Apart, Teapots and Flying Saucers, Up in Smoke, Pregnant Pause

This work is about “revealing through conversation.” The revelation occurs not through words, but rather, through body language. And in the absence of humans, it occurs through the space and objects left behind by its inhabitants.

The viewer steps into the midst of an intimate conversation, yet finds only silence. What appears to be a scene of domestic tranquility -- a calm on the surface -- slowly transforms into a mounting unease because, while the space is typically set for two, there is a distinct sense of being alone, of engaging someone or something that isn't there. What is left to contemplate is the aborted conversation, the miscommunication, the emptiness of words, the unspoken word. In its state of suspension, the narrative communicates a sense of waiting, wanting, and hope. It speaks about the expectations, the potential, and the psychological tensions that exist within that single moment of time.

Technical Overview

These prints weave together digital and traditional technologies by integrating 3D modeling, 2D imaging, and non-toxic etching techniques through the following process:

1. Each image begins as a 3D computer-generated model. The scene is modeled digitally so as to remove the artist's hand from the “drawing,” thereby charging the image with an emotional distance.
2. After the modeling is complete, the rendering is imported into Photoshop, where scanned patterns, 2D elements, and distortions of space are added and manipulated, giving a further twist to the image's sense of logic.
3. The image is then separated into the four process colors used in commercial printing (cyan, magenta, yellow, and black), and each layer is printed onto a transparency. These transparencies are exposed onto photopolymer etching plates, which are then hand-printed in the traditional intaglio manner.

The polymer multiple-plate printing technique results in an intensity of color that is unachievable with traditional etching. Furthermore, this printing method retains the original image's pixels, thereby producing a soft, slightly grainy surface that accentuates the overall nostalgic tone.

Contact

Janet Ballweg

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Community Tea Project

My art investigates the nature of relationship -- to home, objects, place, history, family, and community. I am concerned with how we capture a moment and how memory is held. Relationships are nurtured with sharing and interacting.

I am intrigued by the way we interact with and within the spaces we inhabit, and how these spaces affect our view of the world at large. The correspondence practice is beautiful because the ephemeral nature of the exchange can not be documented or recorded. I work with book arts, mail arts, ceramics, found objects, and other media. I often experiment in new ways to tell a story or create something that appeals to a different sense. Because of the intimate and changing nature of home, there is an intersection where my practice meets home, my correspondence, and books. I come from a long history of letter writers. Since I was young, I have tried to push the limits of what can be exchanged through the mail. For me, the magic of the correspondence is not just what goes through the mail but the relationship that is built and the journey that takes place between the two destinations. Often I create and mail something that is a gift only to be shared with the recipient. It could be a card I letter-pressed to mark a certain day of importance or a watercolor painting of a particular image. It is the intimate space between myself and the recipient that I am honoring with these works. With my art, I try to make small and quiet spaces for enjoying moments away from the hectic world that exists outside. I honor connections and wisdom that have been shared with me and the intimacy that can exist even across vast distances. I hope to raise questions about where we can find comfort or healing, and how we can find common ground despite our many differences.

Technical Overview

For the past two years, I have been working on a project that creates community through the mail. I created a collection of small mailable ceramic tea pots and asked the recipients to all drink the tea at the same time. I asked each person to send back some sort of response. I did not ask for anything specific because I wanted to see which part of the project had an impact on the individual. I created a book that now houses all of the responses that have come back to me in the form of postcards, illustrations, photographs, stories, and poems. With each response, I have the photograph of the box with the teapot that was sent. For me, the process of preparing the teapot for the journey was an essential part of the project.

I received a variety of responses from my tea project. Many people chose to respond to the fact that they were part of a group project. One mentioned that it ended up being a lonely experience. Some brought their teapot to work so they could fit it into their everyday lives. Many families included their children in their tea drinking.

In addition to the book, I created a web site that contains all of the responses, and I invited the participants and others to see who else participated in the project. This project is as much about time as it is about community, and I hope I can continue it for a long time. No part of this project or process can be rushed, and I find that stopping and consciously enjoying a moment becomes more and more rare.

Contact

Mare Dianora

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Contrast

My work is a journey of exploration and experience, then questioning and responding in the form of tangible and non-tangible creative processes. Art and our existence go together whether it is about socio-political, ecological, personal or emotional experiences.

The world around me is the inspiration for and source of ideas. It is very exciting and satisfying to find appropriate subjects and record images on the film for later use. Clay is a very rich, tangible medium with which I can achieve painterly colors and textures that are embedded within forms. I also like to use glass and wood. From very simple concepts, I create elaborate and expressive work that becomes engaging and inviting.

In this piece, the concept is the dilemma of our existence within our environment. It is a simple concept, but it carries a complex message. The feeling I want to convey is a very simple metaphor represented by a surreal teapot that reveals interesting details as the observer approaches.

Technical Overview

Contrast is based on organic forms in nature. Digital images were transferred to Photoshop. Analog images were scanned. In Photoshop, the images were converted to positive output, which was used to expose the silkscreen. Then glazes were used to transfer the images to clay. Different pieces were fired at different temperatures. The cube base was fired at cone 6. The teapot form was fired at cone 10 in a traditional gas kiln. The piece in between the teapot form and the cube was Raku fired.

Contact

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Evolution of a Creature

As a 3D artist specializing in creatures and characters in pursuit of surrealism, I thought about what has influenced this dynamically fast moving field of artistic and technical research.

It was important for me as an artist to know where my art has come from the past to influence what we have now. The look and feel of a person's artwork can be linked to the tool makers and the research done to develop their tools. This artwork is based on this fact. I had previously done some artwork of a Griffon creature, and so this fur-and-feather-covered teapot is a reflection of where we have come from, and how my work and are evolving.

Technical Overview

This work was created with Autodesk's 3ds Max 7 and Ormatix 1.4 hair plugin by Ephere on an AMD 64-bit fx53 chip with 2gig of RAM.

Contact

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From Digital to Analogue, or the Rebirth of a Teapot

In my research, I have explored using rapid prototyping technology to create computer generated durable output solutions such as heat-resistant molds and positive objects made of ceramic material.

Since I was coming from the perspective of the 3D design and animation realm, I was well aware of the Martin Newell and Jim Blinn teapot experiments. It became obvious to me that the best icon I could possibly use to question the tradition of ceramic making with new technologies like rapid prototyping was Newell's teapot. Just as this object was first selected by Newell and Blinn based on its challenging aspects of shape and form, the teapot became one of the most challenging objects I could render in ceramic with this process.

Since the teapot is made of both positive and negative shapes, and since the handle resides away from the main body of clay, it requires a delicate balance of saturation and curing time for it to dry without breaking. I find particularly interesting the idea that it is now possible to create a functional object from a computer assisted design. The model I am presenting this year has been bisected but has not been glazed in order to demonstrate the technology without hiding it.

Technical Overview

The teapot was rendered using an additive rapid-prototyping process from a digital 3D file. It is inspired by Martin Newell's original analogue Melitta teapot. Since Jim Blinn's rendering experiments were done using an Evans & Sutherland frame buffer, which unfortunately had the disadvantage of having nonproportional pixel appearance, he had to squash the model rather than scale the image in order to print it with its real proportion.

The first experiments made with the rapid-prototyping ceramic process were based on Blinn's squashed version, but ironically the squashed shape did not survive the heat of bisecting. The rather distorted teapot that came out of the kiln had to go back to the original source, and the process had to re-engineered to create this SIGGRAPH 2006 model. This is a representation of the layering extraction involved in the rapid prototyping process.

By dividing by 10 the total amount of layers involved in the creation of the ceramic teapot it is possible to cut out the shape from slices of acrylic sheets.

This example is a good way to demonstrate the process and renders the negative shape in a see-through material.

Contact

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Head Full of Dreams

My work represents the next generation of ceramic artists, who fuse today's technology with one of the oldest traditions in art. To some, the computer is completely foreign, while others have grown up in front of one.

During the day, I work as an art director at a Chicago advertising agency. I use the computer to create a myriad of advertising elements. While at work, I am exposed to programs and media that have direct applications for our clients. But in the back of my mind, I am wondering how can I apply this to my artwork, and when I get home, it is not long before I am situated in front of the computer again. I like to make work that makes people think. Because much of my work deals with personal things in my life, I often use a complex layering of semiotics to convey the meaning. The basic idea sits on the surface, with successive levels buried in symbolism. I give clues to viewers and let them unravel the mystery.

I think the role of art is to convey or evoke emotion, and I hope all of my work succeeds on this level.

Technical Overview

I use the computer in my artwork to illustrate, manipulate, and compose the elements for each piece. It allows me to create several versions of a concept while refining it along the way until there is a version that successfully conveys my vision. Once the concept is complete, I send my computer files out for film positives. I use the film separations to create silkscreens used in transferring the images onto large sheets of wet clay. The process can take several hours and is rather delicate, as the clay is quite soft and records every push and pull. One accidental slip can ruin a piece. My printing medium is glaze and not ink, which presents all sorts of challenges and contributes to the lengthy process.

I like to work wet on wet as it gives me freedom. I can emboss a cardboard trompe l'oeil affect on the surface of the clay and fool people into thinking it's cardboard and not clay. Once the printing is complete, I often give additional volume to the work, so it pops off a wall when it is hung in place. Once the imagery and clay are free of moisture, the work is placed in a kiln and fired. The once-delicate imagery is now permanently fixed to the clay body to stand the test of time.

Contact

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In This, Teapots Are LikeTypefaces

Since the 1970s, few fields have remained untouched by advances in computer graphics, but hardly have been affected so profoundly as typography. Many of the subtleties of letters are forgotten and ignored, especially when designers have myriad fonts to choose from, many of them illegible and overstylized.

I endeavored to make a teapot glyph that accentuates the spirit in each font I used, but also functions legibly and seamlessly within the text. I chose the fonts after much deliberation; they reflect the statements that the text makes and represent commonly used fonts that are archetypes of their class. Beaming with personality, Bodoni MT continues to be an extremely popular and elegant font. Adobe Jenson Pro is based on completely pen-formed letters; its imperfections and inconsistencies recall the humanist calligraphy of the Renaissance. ITC New Baskerville is elegant in its modeled balance and uprightness, showing a true break in type and handwriting. Futura is the quintessential geometric sans serif. Lucida Console has its roots in early digital typography and is used in various other software applications. Adobe Garamond Pro and other interpretations of Garamond's type are the quintessential font for setting books and titles alike.

The text itself tells a history of teapots in broad strokes, leaving it up to the viewer to make the connection to fonts. But the text is not intended to be the focus of the piece, by any means. With the x-height measuring about a quarter-inch, the scale of the letters calls for the letter shapes to be seen as abstract shapes and for the rhythms of whitespace to be much more tangible. When seen at a distance, each typeface clearly creates a different color, as it's commonly referred to, on the page. When seen close up, the citation of each font calls attention to the juxtaposition of teapots and letters and symbols. Not only do the citations give credit to the designers whose creations account for more than 99% of my piece, but they are also insights into the historical context of the letterforms.

Because of their prominent position in culture and history, not to mention their anthropomorphic nature and symbolic status, teapots have unique personalities that operate within their given form. This piece asserts that, for the same reasons, typefaces have similar personalities.

Technical Overview

All but one of the fonts in this piece were cut in metal decades or centuries before the advent of the computer. However, as typography became a digital art, each was reimagined and reconstructed using virtually the same Bézier curves and coordinate systems that made the Utah teapot ubiquitous. The one exception is a font that was created specifically for the computer, a standard monospaced screen font used in many software applications.

The fonts account for over 99 percent of the characters on the page. The remaining one percent (the teapot glyphs) were assembled in Adobe Illustrator CS2 and set in Adobe InDesign CS2. This piece utilizes many digital typographic innovations that are now automatic, namely full justification, kerning, ligatures, and other characteristics of OpenType fonts.

Contact

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inter

It's Tea Time!

It's Tea Time! How often we hear this sentence! People from all walks of life sit together to enjoy a cup of tea for the relaxing sense of community and the aesthetic experience that accompanies it.

This work of art presents a radically different view of tea time and an opportunity to experience a contrast between the simulated design presented by the steam and the tactile, physical, "hands-on" design seen in the embroidered teapot. The steam seen coming out of the spout of the teapot is displayed through a high-dynamic-range display that makes the viewer feel as if the steam is, in fact, on the front side of the embroidery instead of behind it. The hand-embroidered teapot was created with six colors harmonically blended together to form smooth transitions between light and shadow. The varying orientation of the individual stitches makes it appear three-dimensional and solid. The red and orange colors symbolize warmth, love, and passion.

The work contrasts two very different processes: the ancient craft of embroidery and cutting-edge technology. Both processes are designed to be compelling when experienced together so as to remind us that we live in a world where artistry from any source can be juxtaposed to create more expressive visual communication.

Technical Overview

It's Tea Time! consists of two parts: a handmade silk-shading embroidery of the famous Utah teapot and a fluid-dynamics simulation of steam displayed on a special high-dynamic-range display that is much brighter than a conventional monitor. The embroidery is mounted on a frame and attached to the front side of the display. When the dynamically changing steam is displayed on the monitor, it shines through the black cloth and gives the impression of a teapot filled with steaming hot tea.

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Machined Aluminum Utah Teapot by Gershon Elber

In this test case, the iconic Utah teapot model was used as a benchmark shape for research into algorithms for automatically computing 3D machining toolpaths for objects represented by NURBS solid models with curved surfaces, concavities, and hollows.

Technical Overview

The body of the teapot, including spout and handle, was sculpted from a solid block of aluminum in the Advanced Manufacturing Lab of the College of Engineering of the University of Utah.

The Cincinnati Milacron T-500 5-axis horizontal milling center used to make this object has a rapidly spinning cutter, shaped like a rounded drill bit in this case, cylindrical with a hemispherical end, and cutting teeth on both. The machine holds a block of material clamped to a table with three linear and two rotational axes, all under precise computer control. The object of the computation is to generate a 5-axis tool path that sweeps the cutter through the negative volume around the desired object.

The trick is not cutting into the surface of the desired shape, tilting the milling cutter around its ball end to avoid projections such as the spout and handle of the teapot. A larger-diameter roughing cutter is used to remove the bulk of the material first. The lid of the teapot was separately turned on a lathe, specifically a Cincinnati Milacron MillTurn turning center with a 12-tool turret. In a lathe, the cylindrical block of aluminum raw material is spun rapidly, as a sharp cutter moves into and along the axis of rotation.

The Bézier-curve profile of the Utah teapot model is offset and used directly for the final lathe finishing-tool path. The most interesting algorithmic bit is the part that leads up to that, which efficiently roughs out the bulk of the raw material as aluminum chips.

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view

Martin Newell's Original Teapot

This is the original Utah Teapot, as presented by its creator in his PhD dissertation in the summer of 1975. The teapot became a benchmark model for image synthesis programs and an icon in the SIGGRAPH research community.

In 1975, shaded rendering of simple faceted 3D polygon models was new, and the next frontier was finding ways to increase the visible complexity of images. Curved shapes could be approximated by a large number of polygons, but such models were laborious to create and taxed the small memory capacity of the computers of the day.

It is far more elegant to represent smooth objects with a naturally smooth curved-surface representation such as bicubic Bézier patches. But there were few curved-surface objects available to computer graphics researchers in the 1970s. Martin Newell modeled and rendered this table setting scene, including a teapot, tea cups, saucers and spoons, and a milk pitcher, all on a table top with a draped curtain as a background. The Bézier control points of the teapot and other objects were made available within the close-knit DARPA-Net computer graphics research community of the time and later posted to Usenet newsgroups and the internet, where they can still be found.

Technical Overview

This image is Figure 29 from Dr. Newell's PhD dissertation, which was published as a DARPA research technical report and distributed to numerous universities. All of the image pages in both the archival and distribution copies of these documents were original photographic prints. This artifact is an archived original publication print. A high precision CRT camera station generated 4 x 5-inch negatives, and Mike Milochik, the official photographer of the Utah computer graphics project, printed the publication pages from these negatives.

The Bézier curved-surface object models of the tea set, of which the teapot became the most well known, are distinguished by their graceful curved shapes and thrifty use of computer memory. The object were modeled before there were interactive 3D computer-aided-design programs for curved surfaces. Indeed, creation of such programs was an active topic of research. Each physical tea-set object was sketched on graph paper. Control-point coordinates were estimated and typed into a computer terminal, with geometric continuity constraints implied mathematically.

The teapot with its lid, handle, and spout comprise only 28 bicubic Bézier patches, each with 16 3D control points in a 4 x 4 grid. In the circular directions of the teapot body and lid, each patch covers 1/4 of a circle. The control points on and next to the edges of all adjacent patches are collinear, so that there are no sharp edges between the patches.

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Perfectly Rendered

It seems ironic that so much effort has gone into simulation of optically perfect, photorealistic glass, while real glass in art rarely achieves, or even attempts, the perfection shown in synthetic images. At the same time, it seems odd that glass has been such a fertile subject for computer graphics artists, yet similar pollination has not occurred from the computer arts back into physical glass arts. When glassblower Daniel Schreiber and sci-vis researcher William Ray considered these facts, the Looking Glass collaboration project was born. Their work explores the synergy between CG and glass arts.

The Utah teapot has become an icon in the field of computer graphics. In returning the form to three dimensions, the artists have cast a sidelong glance at the pursuit of the perfectly rendered form; it is now, indeed, perfectly rendered.

Technical Overview

Hybrid digital/glass works start out as simple sketches of object profiles. Simple CG lathe techniques allow rapid prototyping of how collections of objects would interrelate in the physical world. The objects are then hand-blown freehand and worked without molds to produce physical objects corresponding to the sketches. Finished glass objects are then digitized in 3D, to provide virtual models of the real pieces. The models can be used for further previsualization modeling of installations or used directly in hybrid sculptural and print works.

The glass objects are formed using traditional glass-blowing techniques. The glass artist and his team of assistants manipulate molten glass, as hot as 2150 degrees Fahrenheit, by repeatedly heating and shaping it with simple hand tools.

Contact

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Plastic Utah Teapot by Steve Sady

In this test case, The iconic Utah teapot was used as a benchmark shape for research into rapid prototyping of complex 3D objects represented by NURBS solid models.

Technical Overview

The solid teapot and separate lid were created as paper-thin layers of white plastic, laid down by a Stratasys FDM (Fused Deposition Modeler) machine. This machine has been described as a computer-controlled hot-glue gun. It continuously melts a plastic cord, squeezing out a very fine trail of molten plastic that cross-hatches each layer of the solid object. This object was made from the third-generation trimmed NURBS Utah teapot solid model created by Russ Fish, based on Martin Newell's original Utah Teapot Bézier patch model and Hank Driskill's second-generation NURBS teapot solid model. The algorithmic research explored slicing the trimmed NURBS surfaces and automatically generating the support structure of grey plastic.

When the surface of the object being created in this way slopes out away from the solid body, each layer can only extend out a small distance beyond the previous one. Wherever the surface angles out more than 45 degrees from vertical, there must already be a support structure in place to hold it up. An ephemeral honeycomb structure is fabricated from a grey plastic, to which the white plastic will only weakly bond. After the prototyping run is completed, the grey plastic support parts are removed.

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SIGGRAPH Teapot

Before anything else, there was the mud. From this primordial ooze sprang all life: the trees and ferns, blue-green algae and bacteria, hamsters and homo sapiens. All that is human originates in this clay, this earth. Semiconductors, too.

As an artist, I seek to find what other things may be hidden in the mud. I am sometimes able to liberate unexpected whimsy; the anthropomorphized earth is surprisingly playful. Other times, I find only gravity and serious ideas. I let the mud direct me, tell me its stories, assemble itself into runes, signs, and symbols. This SIGGRAPH teapot is inspired by the Utah teapot and the influence of computer graphics on motion pictures. It speaks to the effects of computer graphics on our lives and the way we think.

Technical Overview

The work was inspired by electronic imagery. Images of the Utah teapot model were consulted during the initial design work, as were various images of tessellated head-shaped objects.

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Tea 43

Computer graphics arts have a long-standing tradition of exploring reflections and refractions, and seeking perfection in the representation of these physical phenomena in glass.

Traditional glass arts explore similar issues, but are more frequently interested in generating the optically unexpected, rather than the optically perfect. When these realizations were considered by glassblower Daniel Schreiber and sci-vis researcher William Ray, the Looking Glass collaboration project was born. Their work explores the synergy between CG and glass arts.

This work explores the relationship between the form of the Utah teapot as a computational ideal, and the process by which that form is realized using traditional glassblowing techniques. Displayed as a hanging sculptural work, Tea 43 allows a full round glimpse of the glassblowing, teapot-making process – a process that is surprisingly different from the computational lathing process. More of the physical glassblowing process is involved with the construction of necessary, but “not-teapot” appendages that have to be removed later, than in the teapot itself. Interestingly, many of the most intriguing and beautiful optical effects in the teapot are in portions of the work that are eventually removed from the final form and are therefore usually seen only by the artist.

In this companion piece to Perfectly Rendered, the viewer gets the chance to observe, as closely as possible without being present at the glassblowing furnace, the teapot as the artist sees it, before it is finally, perfectly rendered.

Technical Overview

Hybrid digital/glass works start out as simple sketches of object profiles. Simple CG lathe techniques allow rapid prototyping of how collections of objects would interrelate in the physical world. The objects are then hand-blown freehand and worked without molds to produce physical objects corresponding to the sketches. Finished glass objects are then digitized in 3D, to provide virtual models of the real pieces. The models can be used for further previsualization modeling of installations or used directly in hybrid sculptural and print works. The glass objects are formed using traditional glass-blowing techniques. The glass artist and his team of assistants manipulate molten glass, as hot as 2150 degrees Fahrenheit, by repeatedly heating and shaping it with simple hand tools. Metallic oxides provide coloration, in this case a crosshatch of stripes applied to the still-molten glass during the blowing process.

Each of the three hanging proto-teapots in Tea 43 is a Utah teapot in intermediate states of the glassblowing process. Much like the proverbial elephant within the block of marble, the finished teapots remain to be removed from among the blown parts that “aren’t teapot.”

Contact

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Tea Four Two

An interactive teapot and teacup that can be played by you. When you lift the lid of the teapot to various heights, you create a melody on the overtone scale, which is as old as if not older than tea itself. If you play for a just a little while, you will hear harmonies coming out of the teacup. The more you play, the faster or slower you play, will all determine how the music will sound. To stop the music, just place the lid on the teapot and let another person try it out.

In this work, I wanted to work with the idea that both music and sharing a cup of tea are universal methods of communication. I recently read that people who drink tea together tend to talk together and talk more, and in a time of international conflict between apparent differences in religion and politics that is slowly but surely leading to conflicts between cultures, drinking tea and talking together "sounds good."

Tea, like music, is found everywhere. However, unlike musical styles, which tend to stay put where they were developed, tea has made its way from the farthest corners of the world onto the most ordinary of shelves in almost every store around the world. Chinese, Russian, Indian, English, Indonesian teas etc. sit all together peacefully on those shelves without fighting. This work concentrates on the fact that we have things that are different, and we have things in common, and by emphasizing what we have in common, like music and tea drinking, without disrespecting those aspects that are different between our cultures, like religion, we may find ourselves drinking more tea together in harmony. Tea and music are multi-national. Should not peace be international, also?

Technical Overview

The piece is constructed from a teapot and a teacup on a triangular shelf. Inside the lid of the teapot and inside the teacup are small high-quality loudspeakers. Both speakers are connected via cables to a small computer located inside the shelf. The computer runs a small program that creates the music heard when the lid of the teapot is being "played." An ultrasonic sensor located inside the teapot measures the distance between it and the lid of the teapot. By moving the lid up and down, the player can create melodies based on the overtone series (the oldest scale in human history). Since most of the tones of the overtone series harmonize with themselves beautifully, part of the computer program functions to select pitches in the melody.

Several features of the program are designed to guarantee player engagement over a period of time. The more the lid is "played," the more the role of the teacup as "harmonizer" comes into being. If the lid is left off the teapot, the sound is brought down to the level of silence until someone moves it back into the area of the sensor located in the teapot.

Contact

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Tea Set 113/114, Tea Set 119/120

I've been combining technology and traditional art processes for 20 years. These tea sets incorporate traditional methods of making functional and decorative hand-built ceramics. The teapot is a particular challenge to the potter, as the work needs to function properly and be pleasing to the hand and eye. The pieces are fired to stoneware temperatures, the glazes are lead-free, and they are functional.

Technical Overview

For these pieces, their form, construction, decoration, surfaces, and firing were designed and executed with the aid of various computer hardware, software, and peripherals. Software included Maya, Adobe Photoshop, and Adobe Illustrator. The screen-printed and relief surfaces have imagery that originates with a variety of photographs and drawings that are manipulated and turned into stencils. The textural or relief surfaces were created with the aid of laser-engraved and photopolymer plates. The plates were then pressed into large wet clay slabs before cutting and assembly.

Marc Barr

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Teapot

My original idea was to create something very representational of the actual teapot and try to incorporate as much detail as possible. With that in mind, I decided to make a teapot on a flat surface (but by using the photographs of the one single teapot, with each photo being taken from different sides, different points of view), to give viewers the feeling that they are looking at the actual 3D object (seeing different sides, seeing it under different light sources) and receiving information about its shape, lines, perspective, etc. By putting everything in a single composition, I thought that it would be a pretty effective way of illustrating all this information.

I also had this idea in my mind of making something like pixels in digital photographs, where colors are represented by dots placed next to each other, so when you look at the teapot from a distance, it would seem to be one solid color, or as if it is composed of textural lines of colors.

Technical Overview

This piece was composed with the ining, rotating, and sizing tools in Photoshop CS. All of the teapots are photographs of the same one taken under different lighting conditions, against different backgrounds, and from different points of view. Then they were aligned next to each other, in some places to create shape, and in others to represent the lighting. This was done by taking an individual teapot and placing it in the line, separating lines or groups of lines within the same color.

Contact

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Teapot #1, #3

My artwork is about my ongoing fascination with natural patterns and design. This latest series of teapots focuses on interpreting a traditional functional object using the sculptural vocabulary I have developed while examining crystalline growth systems. Using this strategy I am integrating my expressive formal concerns with objects for personal rituals, such as drinking a cup of tea or coffee.

Technical Overview

The process I am using to create these teapots is fairly new to my traditional creative methods. I have begun to incorporate digital technology to create 3D models using Blender 2.41.

I then go into my studio and interpret the 3D renderings with porcelain clay. I build the pots in a way that is similar to how I draw them with the Blender program. Each cube is created individually and then added to the composition. Once the clay has dried, I apply a high-temperature glaze and fire in a gasfueled kiln.

Contact

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Teapot Subdivision

This image celebrates my third generation updating of Martin Newell's original tea-table scene. Dr. Newell taught my computer graphics class in 1975-76 at the University of Utah. He became the chair of my thesis research committee in 1976-77.

His ideas of combining object-oriented procedural modeling with curved-surface geometry strongly influenced my career for the next 20 years, developing the Alpha_1 research geometric modeling system at the University of Utah. Dr. Newell's Bézier teapot model was one of the first curved surface objects available to the computer graphics research community. The teapot became a "benchmark model" for image synthesis programs and an icon in the SIGGRAPH research community.

In creating this image, I improved on Hank Driskill's second generation Alpha_1 procedural/NURBS teapot model and modeled and rendered a scene revealing the lovely new insides of the teapot by slicing it in half like an onion (slightly surreal, I admit). The title, "Teapot Subdivision," is also an oblique reference to the recursive NURBS surface-subdivision algorithm, based on the Oslo algorithms, that is used to adaptively create a bounding volume tree to speed up ray-traced rendering in Alpha_1.

Technical Overview

This is a third-generation teapot model, in a scene modeled using Alpha_1 and rendered by the Alpha_1 ray tracer. Martin Newell's classic 1975 teapot model contains 28 bicubic Bézier patches, each with 16 3D control points in a 4 x 4 grid. In the circular directions of the teapot body and lid, each patch covers 1/4 of a circle and is round within about 1 percent.

There were originally no bottom or inside surfaces for the body, lid, and spout of the teapot. The spout and handle penetrated the body of the teapot, so their ends were visible inside. Hank Driskill made a second-generation teapot as an Alpha_1 procedurally generated, NURBS-surface solid model. The srfOfRevolution operator made continuous, truly round swept surfaces from the Bézier profile curves. Hank added missing interior and bottom surfaces, and a hole drilled down the spout, subtracting it as a post-process while generating polygons for rendering.

This third-generation teapot model has nicer inside shapes and is a true trimmed-surface NURBS solid model. There is one trimmed NURBS surface each for the body, lid, handle, and spout. The hole down the middle of the spout is procedurally tapered and contoured from the outer surface. The combineShells operator joins the body and spout solids together with trimming curves and adjacencies and is also used to slice the teapot body and lid in half for this scene.

A cleaver and chopping block complete the scene. The cleaver was modeled after a real Sabatier knife, which was photocopied, cut out, and taped to a monitor. Outline curves were designed in the Alpha_1 graphical user interface, and the handle and tapered blade were procedurally modeled. The chopping-block surface textures were procedurally sliced and colored from stock wood-grain images, using the Utah Raster Toolkit.

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TEAPOT: The Movie Teaser

Presented as part of the SIGGRAPH 2001 Electronic Theater pre-show entertainment, this piece plays homage to the teaser trailer originally produced for the film "Alien" and, of course, to the Utah teapot.

"In space, no one can hear you steam ..."

Technical Overview

The model of the teapot was created in Maya from the original Utah teapot Bézier patch control points. All of the imagery of the teapot was rendered using Pixar's PhotoRealistic RenderMan and Sony Pictures Imageworks' proprietary lighting interface. The bumpy surface of the shell (meant to evoke the look of the egg from the "Alien" teaser), and the ground cracks were produced using displacement shaders.

The moving star field at the beginning of the piece was captured from a Microsoft Windows screensaver using a video camera. The final shot featuring actress Sigourney Weaver was captured on DVCAM and composited in Inferno. The sound effects in the piece were sampled from a gas stove and a whistling tea kettle, and manipulated using PC-based sound editing tools.

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Tempest (inquiry)

Ann Torrence uses digital photography and Adobe Photoshop compositing techniques to reveal underlying patterns, histories, and relationships in seemingly random movement or the passage of time.

The artist's personal connection to the teapot in computer science stems from her prior work at the School of Computing at the University of Utah. As coordinator of outreach and alumni affairs, she edited the school's newsletter, The Teapot, which was named to honor alumnus Martin Newell's PhD dissertation work. She was inspired to use the icon in her personal work by students and faculty who illustrate today's advanced computer graphics techniques with a teapot motif.

Technical Overview

Tempest (inquiry) was assembled from multiple digital photographs of a glass teapot containing ordinary bubbles in plain water, taken under typical white strobe light without the use of any colored filters. In the post-processing phase, Adobe Photoshop was used to separate each image into its spectralsource grey-level channels. Using single-channel elements from more than a dozen images as sources for the composite, she assembled a new color-channel series to produce the teapot image shown here.

As with film-based multiple-exposure photos, the photographer can use this technique to visualize spatio-temporal histories that are otherwise lost. But, unlike film-based exposures, digital photography gives the photographer immediate access to the spectral-source and precisely time-stamped channels. The resulting transformation of time into spectral space yields a nonrealistic yet evocative approach to image-making. Additional images in this series are available on the artist's web site.

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The Air-Teapot

The Air-Teapot challenges our reliance on sight to understand the world we live in and rebels against the visual dominance of computer interfaces. By tapping with the teaspoon, we can feel and hear a teapot in the space in front of us, but there is nothing to be seen but a teapot stand. This is a teapot with character that convinces you there's more to the world than meets the eye.

Where better to foment a revolution in a teapot than Boston!

Technical Overview

The Air-Teapot is rendered interactively using computer-generated touch and sound. The teapot is the `OpenGL glutSolidTeapot()` graphics primitive modeled on the original Utah teapot. The 3D touch interface is rendered using OpenHaptics and the SensAble Omni force-feedback device. The forces from taps and scrapes on the surface are rendered as sounds in real time using a physical-acoustic model from the Synthesis Toolkit. A narrative composed from a recording of a tea party emanates from the teapot stand where the teapot seems to sit. The work runs on a Windows multimedia PC with an Omni and a speaker attached. There is no screen.

Contact

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The Common World of Tea

There are many distinctive ways that cultures connect to other cultures, through different languages and various traditions. There are also other ways in which cultures share similarities.

One of those is the teapot. For each culture represented in this work of art, the teapot has a different shape. In the different countries, there are unusual styles and diverse arrangements of the parts of a teapot. The simple display of a spout, handle, body, and top are altered to make them either complex or simple yet noticeably unique.

The teapots sit together on a shelf to represent the unity among the countries. The teapot is a form of art that has united companies in computer graphics, and in this piece, it unites nations.

Technical Overview

This digital image was created with Adobe Illustrator and Adobe Photoshop.

Contact

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The Utah Teapot Paperweight 1991

This teapot was introduced in the paper "NC-Machining with G-buffer Method" at SIGGRAPH 91. During the 1980s, the surface patch data of the Utah teapot was widely used as a 3D shape example, and many computer-generated teapot images were presented in various conferences and journals. However, nobody had made the Utah teapot as a real 3D solid. In 1990, we developed a simple framework for NC machining with image-processing techniques called the G-buffer method. In our experiments, we used the teapot data and milled a lot of "hemi-teapots." It worked so nicely that we submitted the paper to SIGGRAPH 91. After the paper was accepted, we made a pair of hemi-teapots by milling modeling wax, and ordered 200 Utah teapots of cast metal. This is one of them. We believe it is the first NC-machined Utah teapot in the world.

Technical Overview

This teapot is made of cast metal. The original solid shapes, a pair of hemi-teapots, were milled with a 3-axis NC machine, and the G-buffer method¹ was used to control the NC machine. The G-buffer method was originally developed for non-photorealistic rendering, such as edge-enhanced drawing and cross hatching.²

By preparing the G-buffer (z-buffer) with a parallel projection, the various functions required for an NC system are realized with-image processing operations. The functions include tool path generation, path verification, and feed-rate control. To generate a tool path, for example, it is necessary to obtain the offset surface, which is not easy to calculate from surface patches. However, it can be easily obtained by the convolution with the G-buffer of the surface and the tool-end shape.

Contact

Takafumi Saito

Tokyo University of Agriculture and Technology
txsaito@cc.tuat.ac.jp

1. Saito, T. & Takahashi, T. 1991. NC machining with G-buffer method. Computer Graphics, 25(4), (Proc. SIGGRAPH 91), 207-216.
2. Saito, T. & Takahashi, T. 1990. Comprehensible rendering of 3-D shapes. Computer Graphics, 24(4), (Proc. SIGGRAPH 90), 197-206.

Wuyi Mountains

In the spring of 2001, my wife and I were invited to participate in a tea tour to regions of China famous for producing tea. When I arrived in Wuyi Shan, I was overwhelmed by the beauty of the landscape of the Wuyi Mountains, the peaks shrouded in mist, and in my mind, I could see all kinds of fantastic shapes. It was just so rich in atmosphere. Taking photographs of these mountains, I knew, as a surrealist, that I wanted to show steaming teapots and tea cups in the mist. When I arrived home, I downloaded my pictures and produced these images by enhancing those shapes on the computer, creating "surrealistic photographs." I strived to preserve the realism of these photographs, using special effects to recreate what I had seen in my mind. On this tea tour, I was learning new things about tea and how it came to be. We visited a teapot factory in Yixing, participated in tea ceremonies, and traveled to different regions to see tea farms and tea factories.

I was strongly impressed by the way tea affects so many aspects of life and nature. The elements (earth, air, water, and fire) all relate back to tea and are crucial to each stage of growth, oxidation, and steeping. It's no wonder that the resulting drink nourishes our bodies as well as our souls. I wanted to show how these elements of nature served as strong inspiration for these pictures.

People often ask me the same question about the Wuyi Mountains: Do they really look like that? I always reply: Yes, they do. In my mind, that was how I saw the mountains, with all those shapes in the landscapes. Relatively very little manipulation was needed for the finished images. The landscape itself was very suggestive. So these questions convince me that I succeeded in creating the effect I wanted. The photographs were taken in April 2001. I created the series of images in August 2002 in preparation for an art exhibit at Tea-Tray in the Sky in Arlington, Massachusetts the following month.

Technical Overview

The Wuyi Mountains Series was published as a set of 12 prints in a box set. The photographs have been exhibited throughout the United States and have been seen in *Tea, A Magazine*. The photographs of The Wuyi Mountain Series were shot with a Nikon Coolpix 800 digital camera. Once the photographs were downloaded to a Mac G4, 12 photographs were selected and taken into Adobe Photoshop to be manipulated: erasing portions of the photograph, cutting and pasting elements within the composition, and air-brushing were all used to create the effect you see in this series. Once the images were completed, they were printed on an Epson 1270 Photo Printer.

Contact

Julian Landa

Surreal Infusions
jldlanda@comcast.net

inter

Location
Hall B Lobby

Days & Hours
Saturday, 29 July
Sunday, 30 July
Monday, 31 July
Tuesday, 1 August
Wednesday, 2 August
Thursday, 3 August

6 – 8 pm
8 am – 6 pm
8 am – 6 pm
8 am – 6 pm
8 am – 6 pm
8 am – 5 pm

International Resources

In the International Center, the multi-lingual International Resources Committee answers attendee questions, hosts presentations for attendees from specific countries and regions, offers space for talks and demonstrations, and provides informal translation services.

International Committee

Kirsten Cater
International Resources Chair
English
University of Bristol
cater@siggraph.org

Matt Adcock
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Media Lab
matta@media.mit.edu

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Miho Aoki
Japanese, English
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University of Alaska Fairbanks
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Alexia Convers
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Volodymyr Kindratenko
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National Center for Supercomputing
Applications, University of Illinois
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Yong Tsui Lee
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Nanyang Technological University
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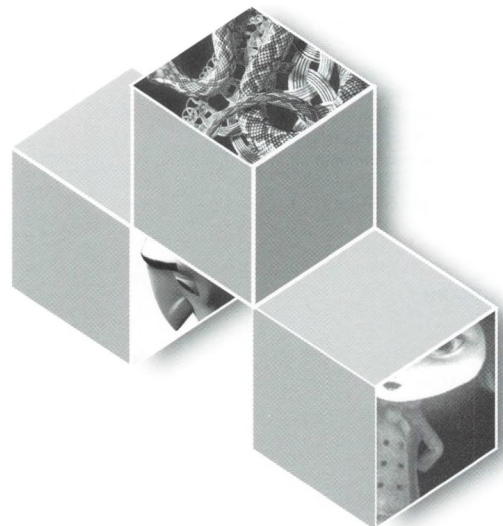
Patrick Marais
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patrick@cs.uct.ac.za

Marilenis Olivera
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Stanford University
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Tulay Tetiker
German, Turkish, English
Alias
tulay@xtensionfx.com



rogate

International Resources Events

Informative international sessions on the current state of computer graphics around the world, organized by representatives of ACM SIGGRAPH and affiliated societies.

Sunday, 30 July

10 am – noon

Overview of SIGGRAPH 2006 (with Japanese interpreter)

Members of the SIGGRAPH 2006 Committee present an overview of the conference and highlights of their programs.

Midori Kitagawa

SIGGRAPH Japanese Liaison
midori@utdallas.edu

4 - 5 pm

SEAGRAPH, ANZGRAPH, and GRAPHITE Meeting

Attendees from Australia, New Zealand, Southeast Asia and surrounding regions are invited to this meeting to find out how we can help each other channel our energies to promote computer graphics activities in these countries. Members of ANZGRAPH (Australia and New Zealand Graphics) and SEAGRAPH (South East Asian Graphics) will present details of their activities during the year and provide information about the forthcoming GRAPHITE conference. Join us, meet others from these regions, and find out how to get involved.

Yong Tsui Lee

Chair of SEAGRAPH
mytlee@ntu.edu.sg

Viveka Weiley

Chair of ANZGRAPH
viveka@siggraph.org

Matt Adcock

matta@siggraph.org

5 - 6 pm

Australasian and Southeast Asian Reception

Come and meet professionals, artists, and students from Australia, New Zealand, and Southeast Asia. This is a great chance to find out what is happening in the computer graphics field in some of the most exotic places on earth. Hosts: the ANZGRAPH and SEAGRAPH organizations.

Yong Tsui Lee

Chair of SEAGRAPH
mytlee@ntu.edu.sg

Viveka Weiley

Chair of ANZGRAPH
viveka@siggraph.org

Matt Adcock

matta@siggraph.org

Monday, 31 July

11:30 am - 1 pm

Inter-Society for the Electronic Arts (ISEA) Open Forum

ISEA is an international non-profit organization fostering interdisciplinary academic discourse and exchange among culturally diverse organizations and individuals working with art, science, and emerging technologies. This discussion includes information about the organization and the upcoming ISEA Symposium to be held in San Jose, California, 5-13 August 2006 and plans for the future of ISEA. All interested members of the electronic arts community are welcome to attend, to learn about future symposia and share ideas for potential organizational collaborations.

Cynthia Beth Rubin

cbrubin@risd.edu

Tuesday, 1 August

10 - 11 am

Japanese Mind in Animation

Is animation enough if it is interesting or full of action? DCAJ will show a series of short animations created by young talents who do not think this is the case and therefore include a variety of sentiment in their animations. You can see real Japanese animations that have not been filtered by western taste. The animation techniques are first class, because all the works were selected by the Digital Content Association of Japan. Also, the 3D Consortium presents an environmentally minded sea-floor observation movie that was CG-processed into 3D.

Toshio Suzuki

Digital Content Association of Japan (DCAJ)
suzuki@dcaj.or.jp

11 am - noon

Industrial Application of CG

A presentation on how the world's most advanced CG technologies are utilized in the Japanese automobile industry and other manufacturing industries.

Toshio Suzuki

Digital Content Association of Japan (DCAJ)
suzuki@dcaj.or.jp

noon - 1 pm

ACM SIGGRAPH In-Cooperation and Sponsored Conferences and Workshops

If you are on a committee for a conference or are thinking of setting one up that is relevant to computer graphics and interactive techniques, then this meeting is for you. The ACM SIGGRAPH Small Conference Coordinators provide information on developing a relationship with ACM SIGGRAPH.

Kirsten Cater

ACM SIGGRAPH Small Conference Coordinator
cater@siggraph.org

Scott Lang

ACM SIGGRAPH Small Conference Coordinator
lang@siggraph.org

Tuesday, 1 August

3 - 3:30 pm

The Teapot Through the Ages

The canonical teapot was modeled over 30 years ago by Martin Newell at the University of Utah. This talk examines how this simple geometric model became a graphics icon and shows some of the many images made of the teapot over the years, as well as the variants of the model that have been made.

Peter Shirley

University of Utah
shirley@cs.utah.edu

3:30 - 4 pm

Enjoying the World's Most Popular Beverage

Apart from water, tea is the most popular beverage in the world. This talk looks at the nature of tea and its history, manufacture, and enjoyment.

Frank Sanchez

Upton Tea Imports

4 - 5 pm

Tea-Time

Meet Frank Sanchez and ask questions about the international culture of tea drinking. Upton Tea Imports will be distributing samples of their products.

Marc J. Barr

Middle Tennessee State University
mjbarr@mtsu.edu

Wednesday, 2 August

9 - 10 am
SIGGRAPH Traveling Art Show Meeting

Every other year, a subset of the art pieces exhibited at the conference is selected to form a Traveling Art Show (TAS). The TAS is available for travel for two years after the completion of the conference. Past exhibitors of the TAS include museums, university galleries, and new-media festivals. If you're interested in bringing these or future art shows to your community, please attend this meeting to find out more, including assistance in scheduling, shipping, and insurance.

Lina Yamaguchi
lina@siggraph.org

10 - 11 am
SIGGRAPH 2007 International Resources Information Session

Are you interested in volunteering for the SIGGRAPH 2007 International Resources Committee? Maybe you'd like to help publicize the conference in your city or country. Or maybe you'd just like to make some suggestions or recommendations about international services for SIGGRAPH 2007. Whatever your level of interest, please join us and meet the ACM SIGGRAPH International Relations Coordinators.

Kirsten Cater
ACM SIGGRAPH International Relations Coordinator
cater@siggraph.org

Scott Lang
ACM SIGGRAPH International Relations Coordinator
lang@siggraph.org

noon - 1:30 pm
ACM SIGGRAPH Professional and Student Chapters Start-Up Meeting

The Professional and Student Chapters of ACM SIGGRAPH span the globe. Within their local areas, chapters continue the work of ACM SIGGRAPH on a year-round basis via their meetings and other activities. Each chapter consists of individuals involved in education, research and development, the arts, industry, and entertainment who are interested in the advancement of computer graphics and interactive techniques, related technologies, and their applications. Chapter members gather throughout the year at meetings, site visits, conferences, video screenings, art shows, and special events.

This session explains how to start and run a successful ACM SIGGRAPH Professional or Student Chapter. Topics regarding the process are outlined in detail by members of the Chapters Committee, and the session concludes with a Q&A session.

Francis McAfee
ACM SIGGRAPH Director for Chapters
mcafee@fau.edu

3 - 4 pm
AFRIGRAPH Meeting (African Graphics Association)

This meeting reviews the latest exciting developments in computer graphics and interactive techniques in Africa, and provide details of the forthcoming AFRIGRAPH conference. Members of AFRIGRAPH also present details of their activities during the year, including an overview of the 4th International Conference on Virtual Reality, Computer Graphics, Visualization and Interaction in Africa, 25-27 January 2006.

Alan Chalmers
alan_chalmers@siggraph.org

Patrick Marais
patrick@cs.uct.ac.za

4 - 5 pm
Computer Graphics in the Czech Republic

Meet professionals, artists, and students from the Czech Republic. This is a great chance to find out what is happening in the computer graphics field in this part of Europe and to hear from members of the newly chartered Prague ACM SIGGRAPH Professional Chapter.

Alexia Convers
alex@ARKYtex.com

Multilingual Tours

To join a tour of the Art Gallery and Emerging Technologies in your language, please meet five minutes before the tour begins at the Art Gallery entrance in Hall B1. Spaces are limited and are available on a first-come, first-served basis.

Monday, 31 July

9 – 9:45 am	Chinese: Mandarin
10 – 10:45 am	Japanese
11 – 11:45 am	Korean

Tuesday, 1 August

9 – 9:45 am	German
10 – 10:45 am	French
11 – 11:45 am	Spanish
2 – 2:45 pm	Japanese
3 – 3:45 pm	Korean
4 – 4:45 pm	Chinese: Mandarin

Wednesday, 2 August

10 – 10:45 am	Spanish
11 – 11:45 am	Chinese: Mandarin
noon – 12:45 pm	Korean
2 – 2:45 pm	Japanese
3 – 3:45 pm	French
4 – 4:45 pm	German

Thursday, 3 August

9 – 9:45 am	Korean
10 – 10:45 am	Chinese: Mandarin
11 – 11:45 am	Japanese

GraphicsNet

Interject your gratitude to the volunteer crew of infrastructure experts who organize the high-bandwidth network that delivers access to every machine in the convention center. GraphicsNet is the digital infrastructure of SIGGRAPH 2006. It interconnects all programs and events and is the gateway to the global graphics community. GraphicsNet is comprised of fiber and Fast Ethernet (100Mbps) links connecting the presentation rooms for Courses, Educators Program, Emerging Technologies, Panels, Papers, Sketches, and Special Sessions. Both a 20Mbps commercial circuit and a 100Mbps Internet2 circuit connects the conference to the internet.

GraphicsNet Committee

David Spoelstra
GraphicsNet Chair
Blackmagic Design

Carlos Cardenas
Tyco Electronics

Bob Cromwell
Cromwell International

Joe Cychosz
Purdue University Network for
Computational Nanotechnology

Larry Kauffman
Sallie Mae Inc.

Ed Konowal
Lee County School District

Kim Nankivell
Purdue University Calumet

Cathy Sewell
Monterey Bay Aquarium Research Institute
(MBARI)

Swaroop Shivarajapura
Purdue University Network for
Computational Nanotechnology

Jim Wilkinson
The Hasten Hebrew Academy of Indianapolis

Javier Zambrano
XSV: Ex-Student Volunteer
Media Mandoca Post

Pathfinders

The Pathfinders program and its volunteer mentors have been offering help to new attendees at SIGGRAPH since 1998. While the format changes some from year to year, the basic idea is the same: to help people navigate through a week at SIGGRAPH and make the most of their time. It's easy to remember how difficult it was to find the things that were cool at our first couple of SIGGRAPH conferences. Pathfinders helps new attendees "find their path."

If you're new to the conference (or just feel overwhelmed): Please stop by the Pathfinders Booth. The booth is staffed with many different people who have been to SIGGRAPH many times and who can help guide you through the conference. We all keep coming to SIGGRAPH because we recognize the value, and we volunteer because we want you to get everything you can out of SIGGRAPH 2006.

We can help you find the specific things that are in your interest areas. We can also help you find some pleasant surprises. We can give advice on your portfolio, how to find work, how to network with people, and how to make it through the day and get up the next morning and do it again (it takes stamina).

Location

Hall B1

Days & Hours

Saturday, 29 July	6 – 8 pm
Sunday, 30 July	8 am – 6 pm
Monday, 31 July	8 am – 6 pm
Tuesday, 1 August	8 am – 6 pm
Wednesday, 2 August	8 am – 6 pm
Thursday, 3 August	8 am – 2 pm

Pathfinders Committee

Lou Harrison
Pathfinders Chair
North Carolina State University

Genevieve Mathieson
Pathfinders Booth Manager
Case Western Reserve University

Student Volunteers

The Student Volunteers program offers selected high school, undergraduate, and graduate students from every discipline the opportunity to become an integral part of the annual SIGGRAPH conference. Students meet and learn directly from computer graphics and interactive media industry professionals, educators, and artists from around the world. They participate in a variety of activities while supporting conference programs, events, and attendees. Student Volunteers also have access to all programs, receptions, and many special events related to the conference in exchange for their service. Student Volunteers are some of the most visible people at the conference because they are stationed at nearly every program and event, providing assistance and direction.

The Student Volunteers Chair and Committee would like to extend a special thanks to the employees at Sony Pictures Imageworks who have donated their time to the SIGGRAPH 2006 Student Volunteers Program. Through both a special Student Volunteers Only Session and individual sessions throughout the week, they share their professional knowledge and expertise with the participating students.

Student Volunteers Committee

Jaime E. Radwan
Student Volunteers Program Chair

Cristobal Y. Cheng
DMP Consulting, Inc.

Matylda Czarnecka
SIGGRAPH 2007 Student
Volunteers Chair

Nicolas Gonzalez

Jason Jerald
University of North Carolina at Chapel Hill

Mona Kasra
Eedeh Media

Birds of a Feather

Attendees who want to get together with others who share their interests, goals, technologies, environments, or backgrounds are invited to organize and/or attend a Birds of a Feather event.

Contact:

3D Printing for Scientific Visualization

Michael Pique
pique@siggraph.org

3D-Pro Brown Bag Social

Jim Meyer
purp@acm.org

ACM SIGGRAPH Carto BOF

Theresa Marie Rhyne
tmrhyne@ncsu.edu

AJAX3D: The Open Platform for Rich 3D Web Applications

Tony Parisi
tparisi@mediamachines.com

Animation Mentor Gathering

Monique Shih
monique@animationmentor.com

arts.siggraph.org

Jacquelyn Morie
morie@ict.usc.edu

Blender Foundation: Community Meeting

Ton Roosendaal
ton@blender.org

Blender Foundation: Open Source Movie Creation

Ton Roosendaal
ton@blender.org

BRL CAD Open Source Solid Modeling

Christopher Sean Morrisson
siggraph@brlcad.org

CAD Society Meeting

Jeffrey Rowe
jrowe@cairowest.com

Cell for Digital Media

Bruce D'Amora
damora@us.ibm.com

Computer Graphics Pioneers

Sherry Westworld
sherry@westworld.com

Computer Graphics Research for Undergraduates

William Joel
joelw@wcsu.edu

DIVERSE-Flexible Open Source VE API

John Kelso
kelso@nist.gov

ETSU Digital Media Alumni Reunion and Advisory Board Meeting

Cher Cornett
cornettc@mail.etsu.edu

Extensions to Interactivity in X3D

Pablo Figuero
pfigero@acm.org

High Dynamic Range Imagery

Alan Chalmers
alan.chalmers@bris.ac.uk

ICC on Color Management in Film Production

Lars Borg
borg@adobe.com

IGDA Game Development Series

Jason Della Rocca
jason@igda.org

Industrial Application of CG

Toshio Suzuki
suzuki@dcaj.or.jp

Japanese Mind in Animation

Toshio Suzuki
suzuki@dcaj.or.jp

Maya for Medical Professionals

David West
west@pxlgraf.com

Medical Working Group-Web 3D Consortium

Sandy Ressler
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Molecular Graphics

Michael Pique
pique@siggraph.org

NVIDIA's Gelato Users Group Meeting

Bea Langsdort
blangsdort@nvidia.com

NYIT Reception

Lynn Pocock
pocock@earthlink.net

Open SceneGraph BOF

Michael Weiblen
mew@mew.cx

Open SG BOF

Dirk Reiners
mail@dirkreiners.com

OZONE: Our 10th Anniversary Year at SIGGRAPH

Kevin Pelleas
kevin@pelleas.org

Purdue University Reunion

Jim Sprinkles
jsprink@purdue.edu

Quality Assurance Brown Bag Get Together

Anna Newman
anewman@pdi.com

RenderMan Users Gathering

Rudy Cortes
rudy@rendermanacademy.com

Ringling School Alumni Reception

Terri Arnell
tarnell@ringling.edu

RIT Alumni Reception

Kelly Redder
karrar@rit.edu

Sharing Ideas in Teaching 3D Animation

Richard Lapidus
lapidus@morainevalley.edu

SPEC/GPC Press Conference

Bob Cramco
bobc@cramco.com

Stony Brook University Center for Visual Computing Reunion

Arie Kauffman
ari@cs.suny.edu

Taipei SIGGRAPH Reunion

Bing Yu Chen
robin@ntu.edu.tw

The CG Performance and Opening Barrel at SIGGRAPH 2006

Toshihiro Yatsumonji
tyatsu@iea.att.ne.jp

Tokyo ACM SIGGRAPH Chapter Party

Yukio Ando
andoh@opengl.com

VERSE-Networked Content Creation Pipelining

Eskil Steenberg
eskil@obsession.se

Visual Effects and Animation Student Meet-Up

Tad Lackman
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Reviewers by Program

Art Gallery: Intersections

Walter Behrnes
Brit Bunkley
Sheriann Ki Sun Burnham
David Burns
Tracy Colby
Greg Cornelius
Jennifer Dowling
Heather Elliot-Famularo
John Finnegan
Greg Garvey
Sue Gollifer
Stephan Hillerbrand
Masa Inakage
Chris Johnson
Mona Kasra
Andruid Kerne
Hye Kyung Kim
Midori Kitagawa
Patrick Lichty
Jeff Lieberman
Elainie Lillios
Gregory Litte
Peter Mackey
Kim Nankivell
Naomi Ribner
Cynthia Rubin
Laura Rusnak
Anne Spalter
Anna Ursyn
Ruth West
Jana Whittington

Art Gallery Papers

Paul Brown
Bill Bigge
Tim Blackwell
Donna Cox
Margaret Dolinsky
Alan Dorin
Dena Eber
Charlie Gere
Sue Gollifer
Simone Gristwood
Phil Husbands
Troy Innocent
Janis Jefferies
Nick Lambert
Patrick Lichty
Tony Longson
Catherine Mason
Jon McCormack
Christiane Paul
Michael Punt
Alan Sutcliffe
Bruce Wands
Mitchell Whitelaw

Courses

Maneesh Agrawala
Tomas Akenine-Möller
Nina Amenta
John Anderson
Ed Angel
Ken Anjyo
Tony Apodaca
Okan Arikan
Mike Bailey
Daniel Baker
Kavita Bala
Adam Bargteil
Francesca Barrientos
Alexander Belyaev
Kevin Björke
David Blythe
Samuel Boivin
Mario Botsch
Jean-Yves Bouguet
Rob Bredow
Robert Bridson
Juan Buhler

Richard Bukowski
Ted Burge
Francesco Callari
Nicola Candussi
Yong Cao
Steve Capell
Nathan Carr
Alan Chalmers
Per Christensen
Jonathan Cohen
Alan Commike
Murilo Coutinho
Willem De Boer
Paul Debevec
Tony Derosé
Laura Downs
Fredo Durand
David Ebert
Ashley Eden
Doug Epps
Petros Faloutsos
Bryan Feldman
Tom Forsyth
Ilja Friedel
Thomas Funkhouser
James Gain
Michael Garland
Reid Gershbein
Andrew Glassner
Mashuda Glencross
Tolga Goktekin
Carlos Gonzalez-Ochoa
Amy Gooch
Bruce Gooch
Craig Gotsman
Brad Grantham
Robin Green
Cindy Grimm
Larry Gritz
Xianfeng Gu
Stefan Gumhold
Igor Guskov
Eric Haines
Mark Hammel
Charles Hansen
Clinton Hanson
Alex Harper
Parag Havaladar
Christopher Healey
Wolfgang Heidrich
Jeff Heisserman
Christophe Hery
Anil Hirani
Kenneth Hoff
Nathaniel Hoffman
Kai Hormann
Donald House
Carl Hultquist
Stephen Hwan
Hayley Iben
Leslie Ikemoto
Masa Inakage
Martin Isenburg
Doug James
Henrik Wann Jensen
Michael Johnson
Thouis Jones
Pushkar Joshi
Tao Ju
Zoran Kacic-Alesic
Florian Kainz
Marcelo Kallmann
Jan Kautz
Alexander Keller
Shawn Kelly
Liliya Kharevych
Andrei Khodakovsky
Mike King
Adam Kirk
Scott Klemmer
Joe Kniss

Mach Kobayashi
Leif Kobbelt
Hilmar Koch
Lucas Kovar
Bob Kuehne
Ilda Ladeira
Paul Lalonde
Hayden Landis
Firstname Lastname
Anselmo Lastra
Gene Lee
Aaron Lefohn
Alex M. Lehmann
Jaakko Lehtinen
Bruno Lévy
Jp Lewis
Chung-An Lin
James Lin
Ming Lin
Karen Liu
Tony Longson
Katerina Mania
Dinesh Manocha
Xiaoyang Mao
Gary Marsden
Steve May
David K. Mcallister
Alexander Mckenzie
Sara McMains
Michelle Meeker
Bruce Merry
Andrew Milne
Jason Mitchell
Henry Moreton
Karol Myszkowski
Shree Nayar
Shawn Neely
Martin Nguyen
David Nunez
James O'Brien
Marc Olano
Victor Ostromoukhov
Valerio Pascucci
Mark Pauly
Jorg Peters
Stace Peterson
Matt Pharr
Fred Pighin
Konrad Polthier
Jovan Popović
Emil Praun
Simon Premoze
Heather Pritchett
Guido Quaroni
Ravi Ramamoorthi
John Rapp
Erik Reinhard
Juergen Richter
Nate Robins
Doug Roble
Charles Rose
Charles Rose
Brian Rosen
Saba Roufchaie
Holly Rushmeier
Szymon Rusinkiewicz
Mark Sagar
Pedro Sander
Guillermo Sapiro
Scott Schaefer
Philip Schneider
Peter Schroeder
Carlo Sequin
Jonathan Shade
Robert A. Shakespeare
Alla Sheffer
Chen Shen
Peter Shirley
Dave Shreiner
Claudio Silva
Maryann Simmons

Peter-Pike Sloan
Philipp Slusallek
Jordan Smith
Ryan Smith
Olga Sorkine
Steven Spitz
Marc Stamminger
George Stantchev
Gordon Stoll
John Sullivan
Richard Szeliski
Ayellet Tal
Rasmus Tamstorf
Gabriel Taubin
Demetri Terzopoulos
Jerry Tessendorf
Tien Truong
P. Jeffrey Ungar
Jan Vandenbrande
Luiz Velho
Kiril Vidimce
Bretton Wade
Michael Wahrman
Colin Ware
Joe Warren
Rüdiger Westermann
Mary Whitton
Holger Winnemoeller
Anthony Wong
Zoe Wood
Wayne Wooten
Yizhou Yu
Li Zhang
Victor Zordan
Denis Zorin

Educators Program

Marc J. Barr
Peter Border
Colleen Case
Esteban Clua
Steve Cunningham
Glenn Goldman
Paula Hindman
Dalton Hunkins
Valerie Miller
Kim Nankivell
Richard Redditt
Anna Ursyn
Adam Watkins
Jana Whittington

Papers

Neeharika Adabala
Andrew Adams
Bart Adams
Anders Adamson
Edward Adelson
Aseem Agarwala
Maneesh Agrawala
Emmanuel Agu
Kurt Akeley
Tomas Akenine-Möller
David Akers
Samir Akkouché
Ergun Akleman
Marc Alexa
Daniel Aliaga
Brett Allen
Pierre Alliez
Pierre Alliez
Nina Amenta
John Anderson
Dragomir Anguelov
Ken Anjyo
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Exhibition

Experience all the tools that empower the fundamental breakthroughs and amazing achievements discussed and displayed at SIGGRAPH 2006. Meet the experts who create the hardware and software that you'll be using tomorrow. Test drive the world's most advanced systems in real time. Ask the questions that are important to your specific applications. And get the answers you need to make critical purchasing decisions.

Important Notice

Registered attendees under the age of 16 must be accompanied by an adult at all times throughout the Boston Convention & Exhibition Center, except for the Exhibition, where children under 16 are not permitted. Age verification is required for the Exhibition.

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VR Software
Web 3D
Web Graphics
Workstation

Exhibitor Tech Talks

interconnect with this year's breakthrough hardware and software. SIGGRAPH 2006 exhibitors demonstrate the systems you need for another year of achievement in computer graphics and interactive techniques. After the sessions, company experts are available for one-on-one conversations about specific questions and applications.

Making Fun: How to Score a Career in the Video Game Industry

Electronic Arts Inc.

Tuesday, 1 August, 9:45 - 11:30 am
Hall A

Mary Welsh

Electronics Arts Inc.
209 Redwood Shores Parkway
Redwood City, California 94065 USA
mwelsh@ea.com

The Future of Creative Expression and Collaboration in Virtual Worlds

Linden Lab

Tuesday, 1 August, 12:30 - 2:30 pm
Hall A

Join us for insights into the latest innovations in avatar expression and creative content collaboration in the 3D virtual world Second Life with Jeffrey Ventrella, Richard Nelson, and Eric Call from Linden Lab. Not familiar with Second Life yet? Check it out at secondlife.com and get your free account today.

Digital Storyboarding

Toon Boom Animation Inc.

Tuesday, 1 August, 9:45 - 11:30 am
Hall A

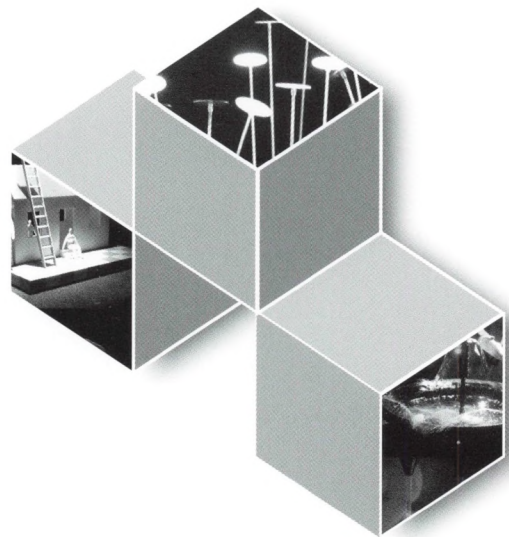
This Toon Boom workshop covers introductory material as well as concrete examples to show the power and flexibility of Toon Boom Storyboard, a powerful storyboarding system for visual storytelling that is perfectly suited to traditional and paperless methods. Truly completing the production pipeline, Storyboard helps users take an idea and translate it into a visual story that will become a complete program, whether animated or live-action. The first half of the workshop is devoted to a high-level introduction to Toon Boom Storyboard for producers, artists, students, and faculty members interested in learning about the system's capabilities. The second half of the workshop focuses on creation of a complete paperless storyboard, using existing templates and rendering real-time, dynamic, and synced animatics.

Karina Bessoudo

Marketing Director
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7 Laurier est
Montréal, Québec H2T 1E4 Canada
karina@toonboom.com

Kara Jordan

Linden Lab
1100 Sansome Street
San Francisco, California 94111 USA
kara@lindenlab.com



3D Real-Time Filmmaking: Machinima Beyond the Game Character Generation, Facial Animation, Scene Production

Reallusion, Inc.

Tuesday, 1 August, 3:30 - 5:30 pm
Hall A

Experience the real-time revolution that blasts Machinima beyond the game inside Reallusion's iClone (fast-paced character generation and scene production) and CrazyTalk, featuring streamlined facial animation and lip-synch tools to bring your virtual cast to life. Learn how everyone with the desire to direct and debut 3D animated movies can shoot movies with Reallusion and uncover the next wave in 3D real-time filmmaking. Get in on the action and join Reallusion and industry leaders in a discussion and technology demonstration designed to ignite an explosion in independent filmmaking and animation production that allows you to create the cast and lose the crew.

John Martin

Reallusion, Inc.
Director of Product Marketing
Reallusion, Inc.
2033 Gateway Place, 5th Floor
San Jose, California 95110 USA
john@reallusion.com

Innovation in Breakthrough Technology: The Cell BE for Acceleration of Digital Content Creation

IBM

Wednesday, 2 August, 9:45 - 11:30 am
Hall A

Innovation has always been at the forefront of what IBM does. We continue to meet the demands of digital content creation (DCC) with our broad spectrum of products. This talk will focus on the latest in innovative breakthroughs for DCC and the use of Cell Broadband Engine technology to accelerate the rendering, image processing, and simulation techniques typically required in DCC applications. The session reviews the primary architectural elements of the Cell Broadband Engine, details how they can be leveraged to provide significant performance advantages when creating and processing digital content, and reviews the more commonly established programming models used to implement several common image processing algorithms.

Bruce D'Amora

IBM T. J. Watson Research Center
1101 Kitchawan Road/Route 134
Office 18-208
Yorktown Heights, New York 10598 USA
damora@us.ibm.com

Training for Careers in Animation and Technology

Vancouver Film School

Wednesday, 2 August, 1 - 3 pm
Hall A

Interested in a career in the world of animation? This session includes a screening of outstanding student work, a comprehensive overview of the Vancouver Film School's classical and 3D animation programs, admissions requirements, and career opportunities, and a question-and-answer period.

Janet Cacchioni

Vancouver Film School
200-198 West Hastings Street
Vancouver, British Columbia V6B 1H2 Canada
jan@vfs.com

X3D: The 3D Solution for Web, Documents, and Real-Time Applications

Web3D Consortium

Wednesday, 2 August, 3:30 - 5:30 pm
Hall A

The X3D standard has evolved over 10 years while other 3D standards have come and gone. X3D is growing with content and applications from a variety of sectors and across a variety of hardware platforms. X3D is turning out to be not only viable; it also has a vibrant, dynamic, and innovative community of content and application developers who see this standard as the ideal format for archival, real-time 3D graphics. See the latest real-world applications and content, and find out just how useful X3D can be for your 3D graphic needs.

Rita Turkowski

Executive Director
Web3D Consortium
225 Bush Street, 16th Floor
San Francisco, California 94104 USA
rita.turkowski@web3d.org

Exhibitor Sessions

NVIDIA Next-Generation Programmability in OpenGL **Wednesday, 2 August, 9:45 - 10:30 am**

The next generation of NVIDIA OpenGL Extensions offers a much more flexible shader instruction set and brand new programmable pipeline stages. This presentation describes how this new functionality is exposed via extensions in OpenGL and how it can be used from high-level shading languages such as Cg and GLSL. It also presents examples of using these new features for both graphics and general-purpose computation applications.

Physics on NVIDIA GPUs **Wednesday, 2 August, 11 am - noon**

The extreme parallelism and increasing flexibility of GPUs is making general-purpose computation on GPUs useful in real-world applications. This talk reviews the state of the art in game-physics simulation on NVIDIA GPUs, from basic particle-system simulation through rigid-body dynamics. The presentation showcases Havok FX, a GPU-based game-physics API co-developed by Havok and NVIDIA. Havok FX leverages state-of-the-art software and hardware technology from NVIDIA to enable physics processing for massive real-time effects. The presentation describes how Havok FX uses NVIDIA technology to simulate and render thousands of particles and rigid bodies in games. Live real-time demos demonstrate the high performance available with current GPUs and provide a look into the future of physics on NVIDIA GPUs.

State-of-the-Art Cross-Platform Shader Development with FX Composer 2 **Wednesday, 2 August, 1 - 2 pm**

Now supporting both OpenGL and DirectX, FX Composer 2 provides a state-of-the-art integrated development environment for shader authoring in Cg and HLSL through COLLADA FX. Attendees will learn all about FX Composer 2's features, including shader profiling support, artist-friendly tweakables, scripting support, custom plug-in architecture, and much more.

Next-Generation Effects **Wednesday, 2 August, 2:15 - 3 pm**

This talk focuses on new Direct3D10 features and effects for the next generation of games. It reviews the new capabilities and performance enhancements that the Direct3D10 API provides and presents several techniques that can be exploited to create new effects.

Optimize Your GPU With the Latest NVIDIA Performance Tools **Wednesday, 2 August, 3:30 - 4:45 pm**

This talk showcases NVIDIA's latest suite of GPU performance-analysis tools for OpenGL and DirectX, including NVPerfKit and NVShaderPerf. Learn how to use NVPerfKit to find and remove bottlenecks with NVPerfHUD, access powerful GPU performance counters with NVPerfSDK, and identify OpenGL API usage and performance errors with GLExpert. Handheld developers will get a brief look at NVPerfHUD ES, a new performance tool for handheld GPUs. Also, learn how to tune your fragment programs using NVShaderPerf.

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129 2d3 Ltd.
120 3D Consortium
2306 3Dconnexion,
a Logitech company
2303 3dMD/3Q
2519 The3DShop.com
1400 3D Systems, Inc.
2302 3D Training Institute (3DTI)
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Research Center
930 AMAX Information
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2030 Anark Corporation
113 Andersson Technologies LLC
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Entertainment AB
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D

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2620 DataDirect Networks Inc.
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2400 DAZ Productions, Inc.
131 DigiPen Institute of
Technology
416 Digital Artist Management Inc./
DAM Consultants, Inc.
508 Digital Content Producer
1231 Digital Domain, Inc./
D2 Software, Inc.
216 Digital Media Arts College
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2616 Digital-Tutors
506 Dimension 3D Printing
2129 Drexel University
2119 DVS Digital Video, Inc.

E

2211 e frontier, Inc.
1530 Electronic Arts Inc.
2417 EON Reality, Inc.
1828 e-on software, inc.
2206 eyeon Software Inc.

F

2424 FiatLux Corporation/KGT
211 Florida Interactive
Entertainment Academy
403 Fork Particle, Inc.
331 Frantic Films Corporation
2329 Freedom of Teach
2527 Future Publishing Limited

G

1700 GenArts, Inc.
123 Genesis Microchip Inc.
207 Gibbs College
226 Google
215 Great Eastern Technology
308 The Guildhall at SMU

H

2223 Hash, Inc.
1203 Hewlett Packard Company
827 Hotronic, Inc.

I

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2518 I-CubeX
417 IdN Magazine
2011 IDT Entertainment
617 Illuminate Labs
1211 Immersion Corporation
2308 Immersive Media Corp.
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J

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2116 JourneyEd.com

K

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L

426 LAIKA
102 Lightspeed Design, Inc.
301 Linden Lab
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M

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603 MAXON Computer Inc.
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Systems, Inc.
423 Meta Motion
2619 Microsoft Corporation
508 millimeter
831 The MIT Press
307 Mitsubishi Electric
Research Laboratories
317 Mitsue-Links Co., Ltd.
2014 Morgan Kaufmann/Focal
Press Publishers
1503 Motion Analysis Corporation
1027 MOVA

N

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515 NEC Display Solutions of
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125 New York Film Academy
2526 New York Institute of Technology
2425 New York University - CADA
1518 NewTek, Inc.
2522 Nextstar
630 NextEngine Inc.
402 Next Limit Technologies
2622 Northeastern University
1017 NVIDIA Corporation

O

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of Telecommunications
2408 Okino Computer
Graphics, Inc.
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P

306 P.I. Engineering, Inc.
2018 Peachpit Press
2614 PipelineFX, LLC
811 Pixar Animation Studios
1223 Pixologic, Inc.
626 PNY Technologies, Inc.
928 Point Grey Research Inc.
2219 Post Magazine (COP
Communications, Inc.)
1728 Purdue University, Department
of Computer Graphics
Technology

R

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229 Ravensbourne College of Design
and Communication
600 Realusion Inc.
419 REALVIZ S.A.
2026 Relic Entertainment
203 Renderosity
2023 Rhythm & Hues Studios
411 Ringling School of
Art and Design
105 Robert McNeel & Associates
200 Rochester Institute of
Technology, College of
Imaging Arts and Sciences

204 Rochester Institute of Technology,
New Media Design and Imaging
School of Design
214 Rochester Institute of
Technology, The School of
Film and Animation

S

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2016 Savannah College of Art
and Design
2629 SeeFile Software LLC
408 SensAble Technologies, Inc.
1731 Side Effects Software Inc.
715 snowball | VFX
431 Solid Modeling Solutions
109 Solidscape, Inc.
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2404 SpheronVR AG
1601 Spine3D
2419 Springer
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615 Storewiz, Inc.
514 Stratasys, Inc.
2628 StudentFilmmakers, The
Magazine and Online Portal
323 Sybex, An Imprint of Wiley
504 Syflex LLC
126 syncVUE (Intelligent Gadgets)

T

2300 Tech Data Corporation
2430 Technicolor
208 TechViz
2406 TeraRecon, Inc.
1702 Texas Memory Systems
619 Thomson Course Technology/
Charles River Media
2516 Tobii Technology AB
1201 Toon Boom Animation, Inc.
414 Torcomp, Inc.
2202 Total Immersion
2626 Triple Squid Software Design
108 T-Splines, LLC

U

118 The University of the Arts
629 University of Massachusetts
Dartmouth

V

926 Valenciennes Digital/Supinfocom
2204 Vancouver Film School
616 Vertus
823 Virtools SA
1014 VisMasters
1301 Visual Media, LLC

W

1011 Wacom Technology Corp.
1227 Walt Disney Animation
223 Web3D Consortium
2428 Westbridge Film School
1501 Wolfram Research, Inc.
606 wondertouch, LLC
132 WorldViz LLC

X

517 Xerox Corp.

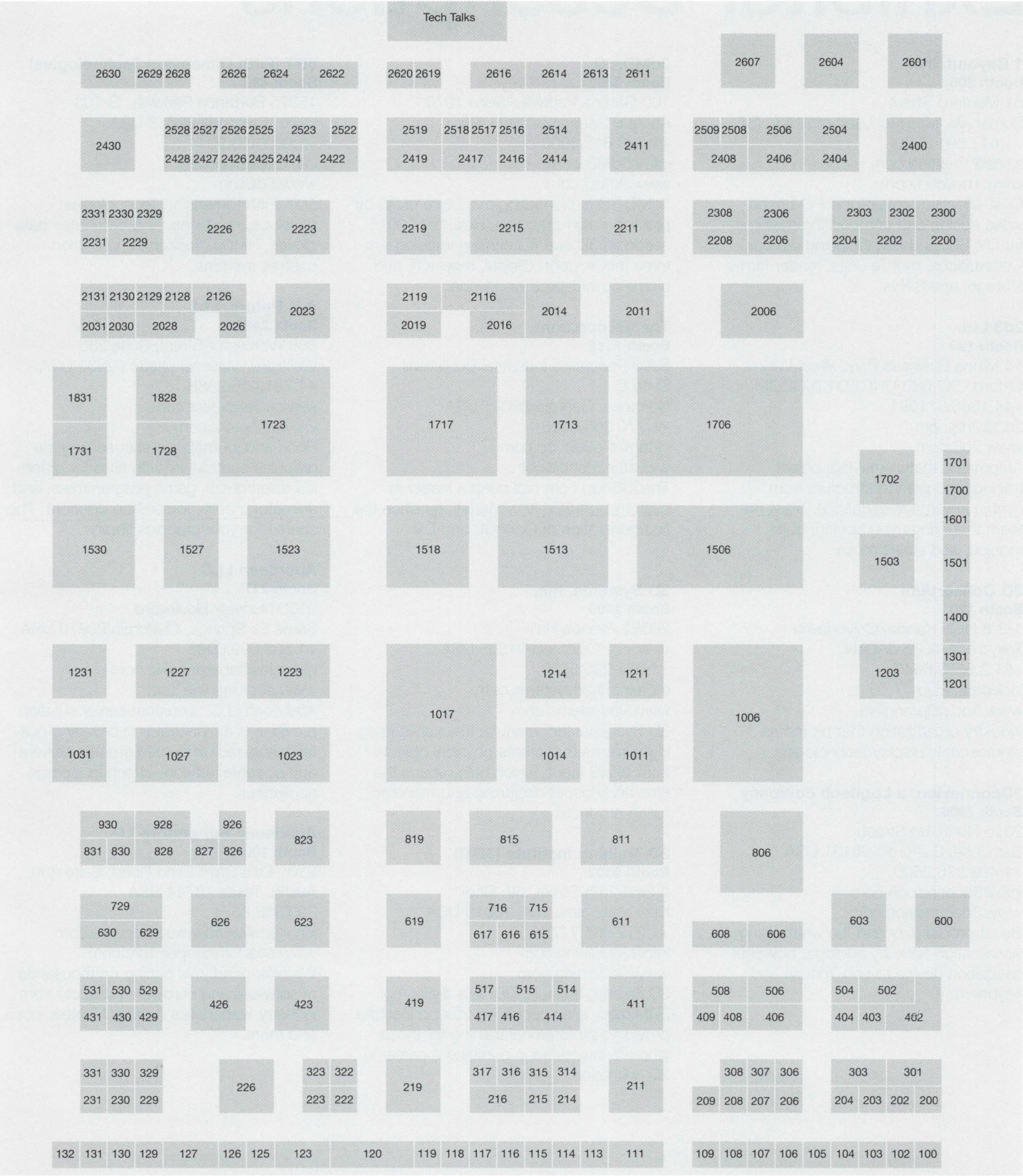
Y

2427 Yorkshire Forward

Z

1831 Z Corporation
2411 Zygo Media Group, Inc.

Exhibitor Map



Exhibitor Descriptions

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www.3dc.gr.jp/english
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cktan@the3dshop.com
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www.3dsystems.com
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www.3dtraining.com
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www.quest3d.com/
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Akasaka Natural Vision Research Center**Booth 608**

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www.blender.org
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Booth 623

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at Boston University**

Booth 531

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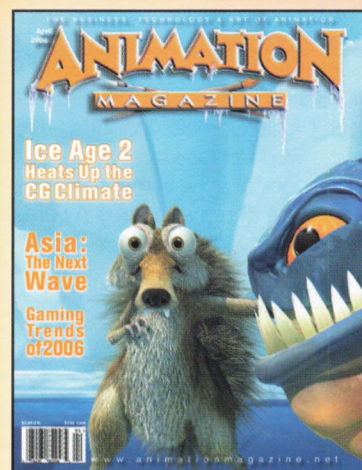
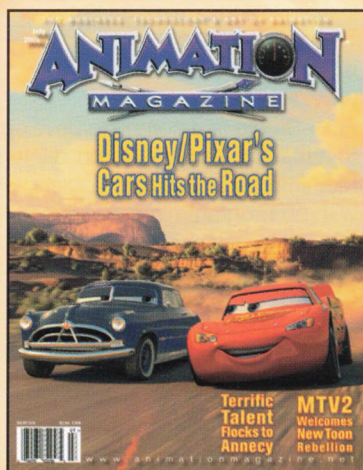
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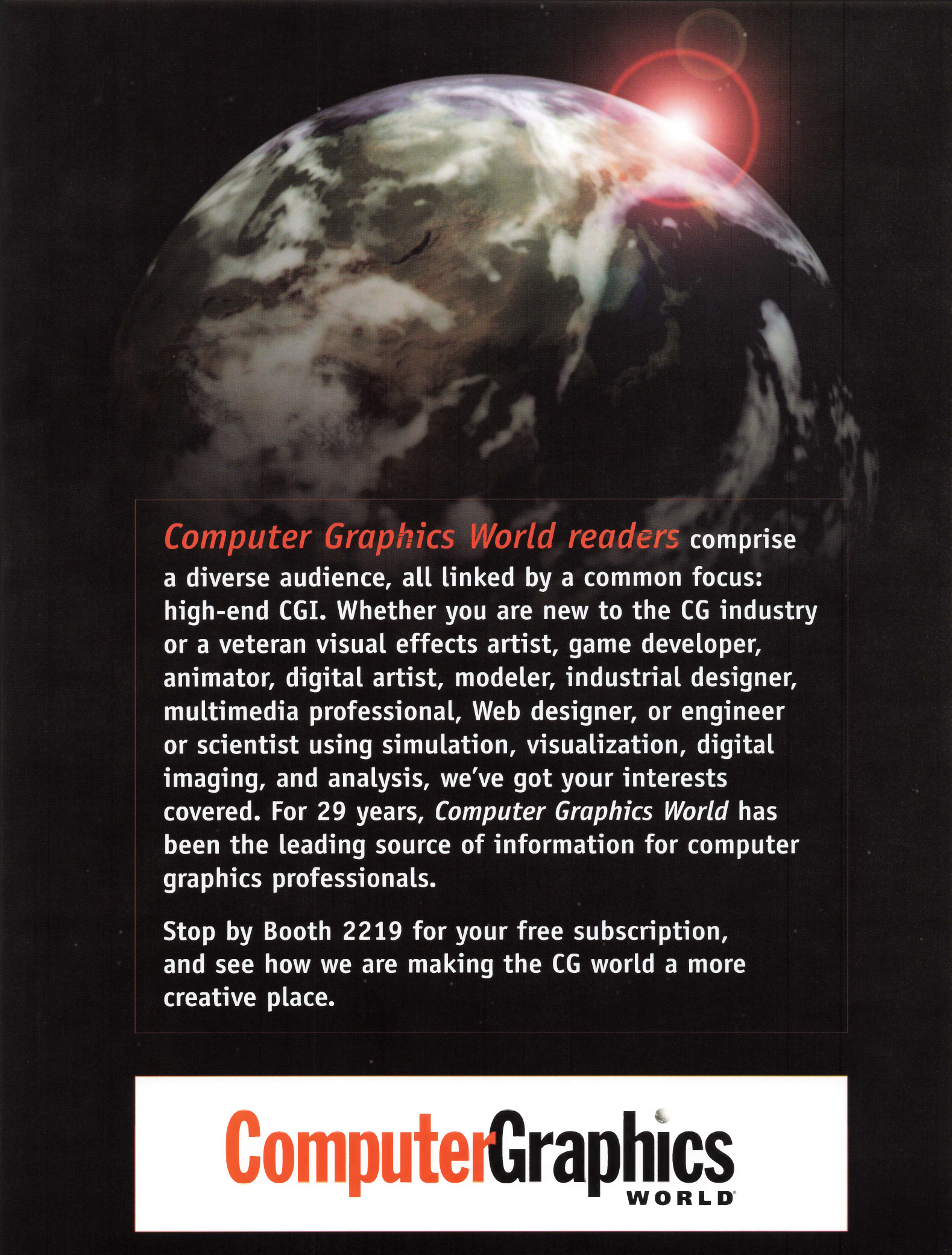
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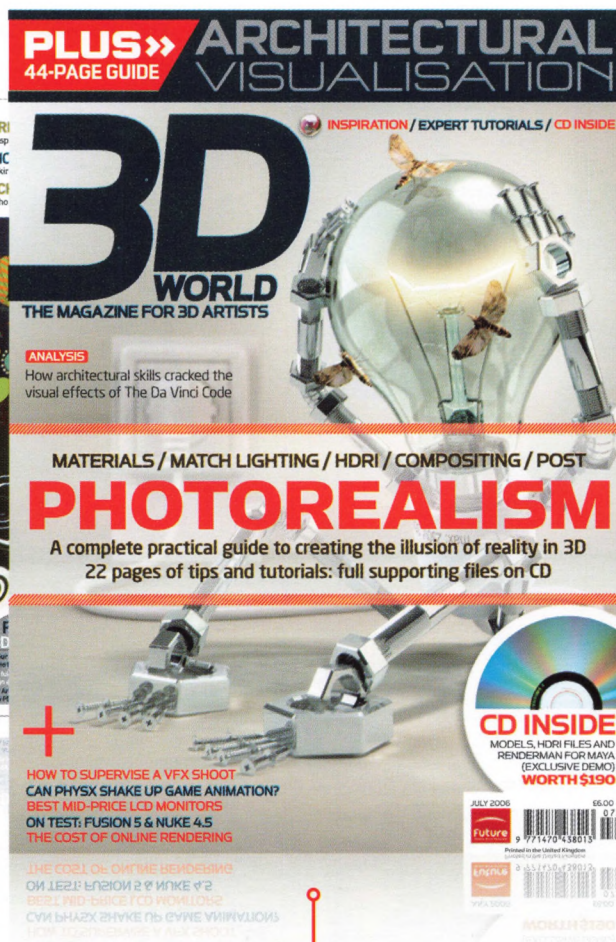
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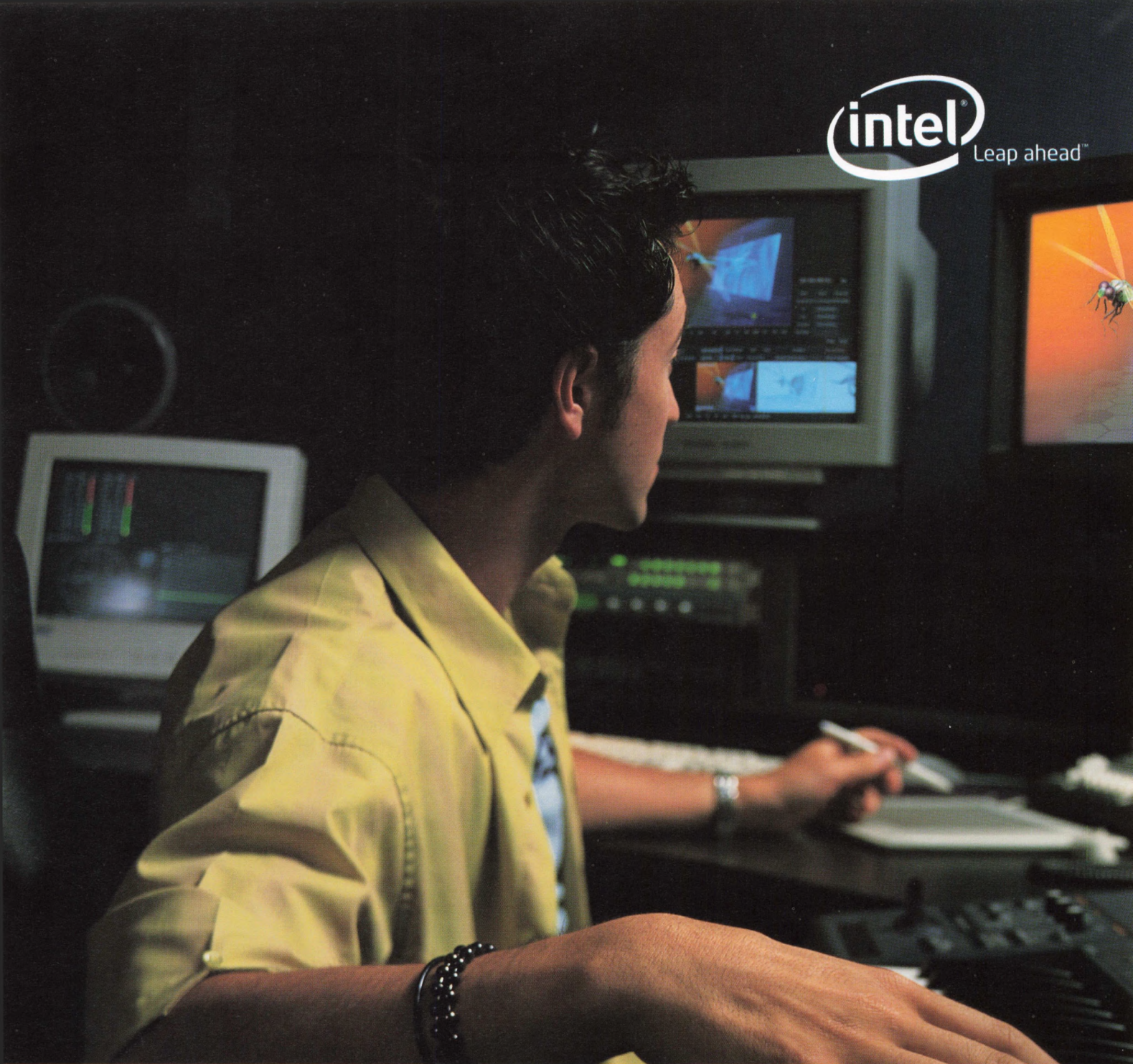
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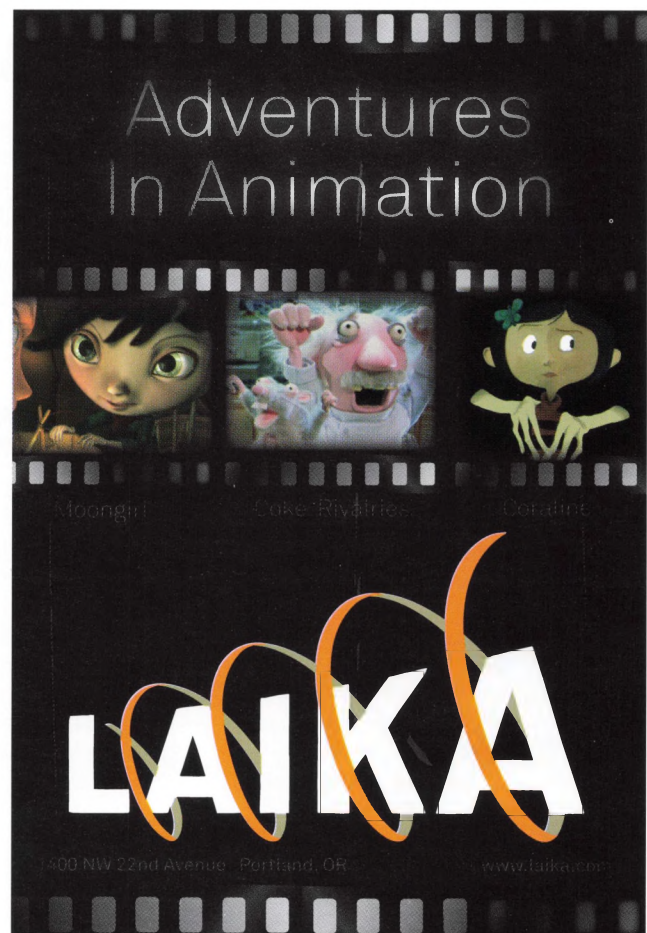
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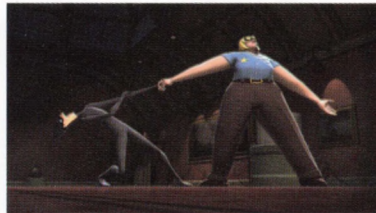
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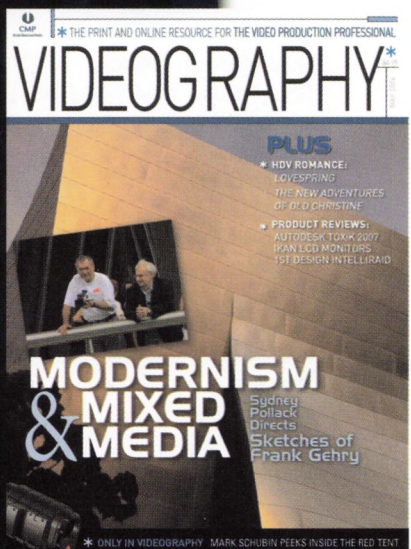
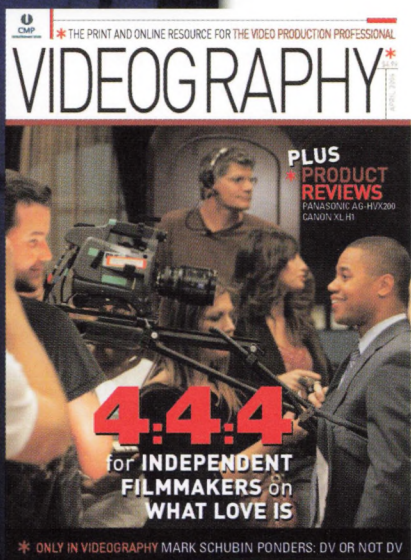
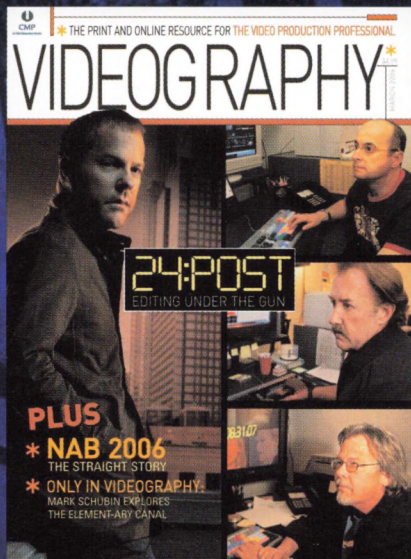
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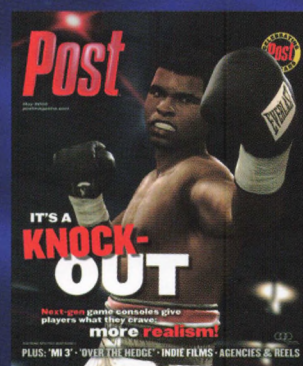
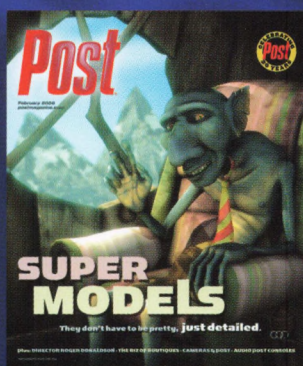
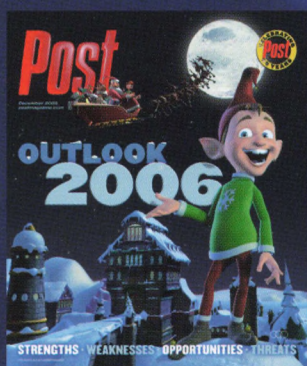
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1700	GenArts, Inc.
2223	Hash, Inc.
2116	JourneyEd.com
611	Khronos Group
301	Linden Lab
1023	Massive Software
1518	NewTek, Inc.
715	snowball VFX
126	syncVUE (Intelligent Gadgets)
531	The Center for Digital Imaging Arts at Boston University
414	Torcomp, Inc.
1301	Visual Media, LLC



Look how far you've come in 20 years.
Thanks for reading us along the way!



(There will be a quiz.)

COME SEE US AT THE SHOW: BOOTH 2219

Digital Cameras

2303	3dMD/3Q
2519	The3DShop.com
100	Academic Superstore LP
729	B&H Photo-Video
209	BrightSide Technologies Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
2116	JourneyEd.com
1503	Motion Analysis Corporation
928	Point Grey Research Inc.
2404	SpheronVR AG
2428	Westbridge Film School

Digital Imaging

2519	The3DShop.com
2302	3D Training Institute (3DTi)
2303	3dMD/3Q
2523	Act-3D, B.V.
2019	Addison-Wesley Professional
2006	Adobe Systems Incorporated
608	Akasaka Natural Vision Research Center
1513	ATI Technologies Inc.
729	B&H Photo-Video
1527	Blender Foundation, Open Source Pavilion
531	The Center for Digital Imaging Arts at Boston University
130	CMG-Collaborative Media Group
303	Corel Corporation
131	DigiPen Institute of Technology
2616	Digital-Tutors
2211	e frontier, Inc.
1828	e-on software, inc.
2206	eyeon Software Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
617	Illuminate Labs
1211	Immersion Corporation
2528	MediaLab
1518	NewTek, Inc.
402	Next Limit Technologies
2018	Peachpit Press
1223	Pixologic, Inc.
928	Point Grey Research Inc.
419	REALVIZ S.A.
715	snowball VFX
2404	SpheronVR AG
126	syncVUE (Intelligent Gadgets)
616	Vertus
1301	Visual Media, LLC
223	Web3D Consortium
2428	Westbridge Film School
1501	Wolfram Research, Inc.
2411	Zygote Media Group, Inc.

Digital Video Hardware

206	1 Beyond, Inc.
2519	The3DShop.com
100	Academic Superstore LP
1031	AJA Video Systems Inc.
1513	ATI Technologies Inc.
729	B&H Photo-Video
219	Barco
1523	BOXX Technologies, Inc.
209	BrightSide Technologies Inc.
2119	DVS Digital Video, Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
2308	Immersive Media Corp.
2116	JourneyEd.com
102	Lightspeed Design, Inc.
1518	NewTek, Inc.
1017	NVIDIA Corporation
502	Orad Hi Tec Systems Ltd.
928	Point Grey Research Inc.
223	Web3D Consortium

Digitizing Cameras

2303	3dMD/3Q
100	Academic Superstore LP
729	B&H Photo-Video
1211	Immersion Corporation
2028	InSpec Inc.

Display Technology

729	B&H Photo-Video
2527	Future Publishing Limited
215	Great Eastern Technology
1203	Hewlett-Packard Company
307	Mitsubishi Electric Research Laboratories
1017	NVIDIA Corporation
1011	Wacom Technology Corp.

DVD Authoring Tools

206	1 Beyond, Inc.
2519	The3DShop.com
729	B&H Photo-Video
2527	Future Publishing Limited
1203	Hewlett-Packard Company

Education/Training

2302	3D Training Institute (3DTi)
429	5DT (Fifth Dimension Technologies)
100	Academic Superstore LP
1723	Academy of Art University
2019	Addison-Wesley Professional
2030	Anark Corporation
530	Anzovin Studio
1006	Art Institutes
115	ASC-American Cinematographer
219	Barco
1701	cebas Computer GmbH
531	The Center for Digital Imaging Arts at Boston University
2611	The Cleveland Institute of Art
130	CMG-Collaborative Media Group
222	Cogswell Polytechnical College
131	DigiPen Institute of Technology
216	Digital Media Arts College
2129	Drexel University
2206	eyeon Software Inc.
211	Florida Interactive Entertainment Academy
215	Great Eastern Technology
2200	International Academy of Design & Technology
114	ITT Educational Services, Inc.
301	Linden Lab
423	Meta Motion
2128	National Animation & Design Centre
125	New York Film Academy
2425	New York University - CADA
2622	Northeastern University
2130	Ohio University School of Telecommunications
2018	Peachpit Press
1728	Purdue University, Department of Computer Graphics Technology
203	Renderosity
411	Ringling School of Art and Design
200	Rochester Institute of Technology
2016	Savannah College of Art and Design
431	Solid Modeling Solutions
109	SolidScape, Inc.
2628	StudentFilmmakers, The Magazine and Online Portal
126	syncVUE (Intelligent Gadgets)
619	Thomson Course Technology/Charles River Media
1201	Toon Boom Animation, Inc.
118	The University of the Arts
629	University of Massachusetts Dartmouth
2204	Vancouver Film School
223	Web3D Consortium
2428	Westbridge Film School
1501	Wolfram Research, Inc.
132	WorldViz LLC
2411	Zygote Media Group, Inc.

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AND INFORMATION

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Electronic Publishing

2006	Adobe Systems Incorporated
531	The Center for Digital Imaging Arts at Boston University
130	CMG-Collaborative Media Group
1530	Electronic Arts Inc.
1828	e-on software, inc.
2206	eyeon Software Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
2116	JourneyEd.com
301	Linden Lab
1717	Lucasfilm Ltd.
126	syncVUE (Intelligent Gadgets)
616	Vertus
1301	Visual Media, LLC
1501	Wolfram Research, Inc.

Encoders/Decoders

2519	The3DShop.com
1031	AJA Video Systems Inc.
1513	ATI Technologies Inc.
1706	Autodesk, Inc.
729	B&H Photo-Video
1523	BOXX Technologies, Inc.
209	BrightSide Technologies Inc.
131	DigiPen Institute of Technology
2119	DVS Digital Video, Inc.
611	Khronos Group
1301	Visual Media, LLC

Encoders/Decoders-HW

206	1 Beyond, Inc.
2519	The3DShop.com
1513	ATI Technologies Inc.
729	B&H Photo-Video
1523	BOXX Technologies, Inc.
209	BrightSide Technologies Inc.

Engineering Applications

429	5DT (Fifth Dimension Technologies)
2030	Anark Corporation
819	auto.des.sys, Inc.
430	Axceleon Inc.
2426	Caligari Corporation
131	DigiPen Institute of Technology
2417	EON Reality, Inc.
2424	FiatLux Corporation/KGT
1211	Immersion Corporation
2308	Immersive Media Corp.
2517	IntegrityWare, Inc.
2116	JourneyEd.com
1023	Massive Software
402	Next Limit Technologies
2408	Okino Computer Graphics, Inc.
2614	PipelineFX, LLC
105	Robert McNeel & Associates
431	Solid Modeling Solutions
414	Torcomp, Inc.
2626	Triple Squid Software Design
108	T-Splines, LLC
223	Web3D Consortium
1501	Wolfram Research, Inc.
132	WorldViz LLC

Furniture

2519	The3DShop.com
2414	Anthro Corporation
729	B&H Photo-Video

Geographic Information Systems

2308	Immersive Media Corp.
307	Mitsubishi Electric Research Laboratories
223	Web3D Consortium

Geographic Information Systems-HW

1203	Hewlett-Packard Company
2308	Immersive Media Corp.
307	Mitsubishi Electric Research Laboratories
2408	Okino Computer Graphics, Inc.
414	Torcomp, Inc.
223	Web3D Consortium

Graphic Design Systems

2523	Act-3D, B.V.
2006	Adobe Systems Incorporated
608	Akasaka Natural Vision Research Center
2030	Anark Corporation
819	auto.des.sys, Inc.
531	The Center for Digital Imaging Arts at Boston University
131	DigiPen Institute of Technology
1828	e-on software, inc.
2206	eyeon Software Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
2116	JourneyEd.com
1017	NVIDIA Corporation
2614	PipelineFX, LLC
1223	Pixologic, Inc.
715	snowball VFX
431	Solid Modeling Solutions
414	Torcomp, Inc.
1301	Visual Media, LLC

Graphics Accelerator Boards

206	1 Beyond, Inc.
2519	The3DShop.com
1513	ATI Technologies Inc.
729	B&H Photo-Video
403	Fork Particle, Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
2116	JourneyEd.com
611	Khronos Group
2619	Microsoft Corporation
1017	NVIDIA Corporation
414	Torcomp, Inc.

Graphics Accelerator Boards-HW

206	1 Beyond, Inc.
2519	The3DShop.com
729	B&H Photo-Video
1523	BOXX Technologies, Inc.
403	Fork Particle, Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
1017	NVIDIA Corporation
502	Orad Hi Tec Systems Ltd.
626	PNY Technologies, Inc.
1501	Wolfram Research, Inc.

Graphics Standards Software

2523	Act-3D, B.V.
1513	ATI Technologies Inc.
1828	e-on software, inc.
611	Khronos Group
2619	Microsoft Corporation
223	Web3D Consortium

GroupWare

307	Mitsubishi Electric Research Laboratories
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GroupWare Software

307	Mitsubishi Electric Research Laboratories
2629	SeeFile Software LLC
1301	Visual Media, LLC

Haptic Input Devices

2527	Future Publishing Limited
215	Great Eastern Technology
1203	Hewlett-Packard Company
1211	Immersion Corporation
128	Measurand Inc.
423	Meta Motion
307	Mitsubishi Electric Research Laboratories
408	SensAble Technologies, Inc.
414	Torcomp, Inc.
223	Web3D Consortium
1501	Wolfram Research, Inc.

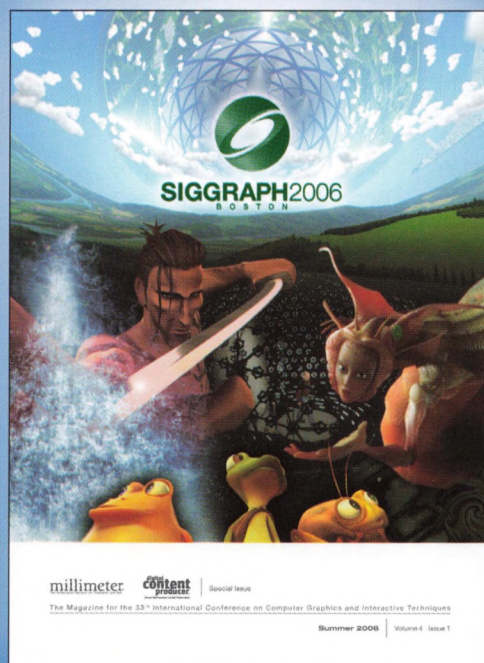
HDTV

1031	AJA Video Systems Inc.
1513	ATI Technologies Inc.
729	B&H Photo-Video
1523	BOXX Technologies, Inc.
2119	DVS Digital Video, Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
307	Mitsubishi Electric Research Laboratories
1017	NVIDIA Corporation
502	Orad Hi Tec Systems Ltd.
126	syncVUE (Intelligent Gadgets)
2428	Westbridge Film School

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Head Mounted Displays

429	5DT (Fifth Dimension Technologies)
2527	Future Publishing Limited
1214	InterSense
423	Meta Motion
223	Web3D Consortium
132	WorldViz LLC

High Performance Graphics Processors

930	AMAX Information Technologies
1513	ATI Technologies Inc.
1523	BOXX Technologies, Inc.
815	Ciara Technologies
409	Digital Media Professionals Inc.
2119	DVS Digital Video, Inc.
403	Fork Particle, Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
1017	NVIDIA Corporation
502	Orad Hi Tec Systems Ltd.
626	PNY Technologies, Inc.
223	Web3D Consortium

High Resolution Technologies

2030	Anark Corporation
219	Barco
1523	BOXX Technologies, Inc.
209	BrightSide Technologies Inc.
2119	DVS Digital Video, Inc.
1214	InterSense
307	Mitsubishi Electric Research Laboratories
1017	NVIDIA Corporation
2404	SpheronVR AG

Image Based Modeling

2302	3D Training Institute (3DTI)
2303	3dMD/3Q
2523	Act-3D, B.V.
2019	Addison-Wesley Professional
2006	Adobe Systems Incorporated
113	Andersson Technologies LLC
131	DigiPen Institute of Technology
2616	Digital-Tutors
1828	e-on software, inc.
2527	Future Publishing Limited
617	Illuminate Labs
1211	Immersion Corporation
301	Linden Lab
307	Mitsubishi Electric Research Laboratories
2018	Peachpit Press
1223	Pixologic, Inc.
928	Point Grey Research Inc.
419	REALVIZ S.A.
431	Solid Modeling Solutions
2404	SpheronVR AG
1014	VisMasters
1301	Visual Media, LLC
223	Web3D Consortium
2411	Zygo Media Group, Inc.

Image Management

2006	Adobe Systems Incorporated
2030	Anark Corporation
130	CMG-Collaborative Media Group
1828	e-on software, inc.
2527	Future Publishing Limited
2416	Isilon Systems, Inc.
2614	PipelineFX, LLC
203	Renderosity
2629	SeeFile Software LLC
715	snowball VFX
1014	VisMasters
1301	Visual Media, LLC

Industrial Design

608	Akasaka Natural Vision Research Center
2030	Anark Corporation
2514	ARTVPS
819	auto.des.sys, Inc.
1706	Autodesk, Inc.
2426	Caligari Corporation
2616	Digital-Tutors
1828	e-on software, inc.
2206	eyeon Software Inc.
2527	Future Publishing Limited
215	Great Eastern Technology
1203	Hewlett-Packard Company
617	Illuminate Labs
1211	Immersion Corporation
2116	JourneyEd.com
1023	Massive Software
1017	NVIDIA Corporation
2408	Okino Computer Graphics, Inc.
105	Robert McNeel & Associates
208	TechViz
2202	Total Immersion
2626	Triple Squid Software Design
108	T-Splines, LLC
1014	VisMasters
1301	Visual Media, LLC
132	WorldViz LLC

Information Visualization

2303	3dMD/3Q
429	5DT (Fifth Dimension Technologies)
2523	Act-3D, B.V.
2019	Addison-Wesley Professional
2030	Anark Corporation
819	auto.des.sys, Inc.
1713	Avid Technology, Inc.
729	B&H Photo-Video
219	Barco
2624	BlueBoxME
209	BrightSide Technologies Inc.
2426	Caligari Corporation
130	CMG-Collaborative Media Group
2508	Cycling '74
1828	e-on software, inc.

2206	eyeon Software Inc.
1203	Hewlett-Packard Company
1211	Immersion Corporation
2308	Immersive Media Corp.
307	Mitsubishi Electric Research Laboratories
1518	NewTek, Inc.
2614	PipelineFX, LLC
408	SensAble Technologies, Inc.
1301	Visual Media, LLC
223	Web3D Consortium
1501	Wolfram Research, Inc.

Input Devices

2306	3Dconnexion, a Logitech company
2519	The3DShop.com
429	5DT (Fifth Dimension Technologies)
608	Akasaka Natural Vision Research Center
2527	Future Publishing Limited
215	Great Eastern Technology
2518	I-CubeX
1211	Immersion Corporation
1214	InterSense
128	Measurand Inc.
423	Meta Motion
307	Mitsubishi Electric Research Laboratories
306	P.I. Engineering, Inc.
928	Point Grey Research Inc.
117	Sandio Technology Corporation
408	SensAble Technologies, Inc.
2516	Tobii Technology AB
1011	Wacom Technology Corp.
1501	Wolfram Research, Inc.
132	WorldViz LLC

Interface Tools

429	5DT (Fifth Dimension Technologies)
2523	Act-3D, B.V.
1031	AJA Video Systems Inc.
404	American Paper Optics, Inc.
2030	Anark Corporation
815	Ciara Technologies
2527	Future Publishing Limited
1211	Immersion Corporation
1214	InterSense
128	Measurand Inc.
423	Meta Motion
132	WorldViz LLC

Mapping and Cartography

429	5DT (Fifth Dimension Technologies)
2019	Addison-Wesley Professional
1828	e-on software, inc.
2619	Microsoft Corporation
307	Mitsubishi Electric Research Laboratories
223	Web3D Consortium

Medical Imaging Software

2303	3dMD/3Q
429	5DT (Fifth Dimension Technologies)
2030	Anark Corporation
2426	Caligari Corporation
2206	eyeon Software Inc.
1203	Hewlett-Packard Company
2028	InSpeck Inc.
603	MAXON Computer Inc.
2619	Microsoft Corporation
1503	Motion Analysis Corporation
402	Next Limit Technologies
203	Renderosity
431	Solid Modeling Solutions
223	Web3D Consortium
2411	Zygot Media Group, Inc.

Mobile Computing

206	1 Beyond, Inc.
2519	The3DShop.com
1513	ATI Technologies Inc.
729	B&H Photo-Video
1523	BOXX Technologies, Inc.
1203	Hewlett-Packard Company
1518	NewTek, Inc.
1017	NVIDIA Corporation

Monitors and Displays

206	1 Beyond, Inc.
120	3D Consortium
2519	The3DShop.com
429	5DT (Fifth Dimension Technologies)
930	AMAX Information Technologies
729	B&H Photo-Video
219	Barco
209	BrightSide Technologies Inc.
130	CMG-Collaborative Media Group
2527	Future Publishing Limited
1203	Hewlett-Packard Company
102	Lightspeed Design, Inc.
307	Mitsubishi Electric Research Laboratories
515	NEC Display Solutions of America, Inc.
1017	NVIDIA Corporation
1011	Wacom Technology Corp.

Motion Capture Equipment

2303	3dMD/3Q
429	5DT (Fifth Dimension Technologies)
729	B&H Photo-Video
2527	Future Publishing Limited
2518	I-CubeX
1211	Immersion Corporation
2308	Immersive Media Corp.
1214	InterSense
2116	JourneyEd.com
128	Measurand Inc.
423	Meta Motion

307	Mitsubishi Electric Research Laboratories
1503	Motion Analysis Corporation
1027	MOVA
928	Point Grey Research Inc.
132	WorldViz LLC

Motion Capture Software

2303	3dMD/3Q
429	5DT (Fifth Dimension Technologies)
2006	Adobe Systems Incorporated
113	Andersson Technologies LLC
1713	Avid Technology, Inc.
729	B&H Photo-Video
1530	Electronic Arts Inc.
2527	Future Publishing Limited
2308	Immersive Media Corp.
1214	InterSense
2116	JourneyEd.com
1023	Massive Software
423	Meta Motion
307	Mitsubishi Electric Research Laboratories
1503	Motion Analysis Corporation
1027	MOVA
928	Point Grey Research Inc.
419	REALVIZ S.A.
504	Syflex LLC1301 Visual Media, LLC

Multimedia Tools and Applications

429	5DT (Fifth Dimension Technologies)
2523	Act-3D, B.V.
2006	Adobe Systems Incorporated
2030	Anark Corporation
1513	ATI Technologies Inc.
729	B&H Photo-Video
2525	Boris FX
2426	Caligari Corporation
531	The Center for Digital Imaging Arts at Boston University
130	CMG-Collaborative Media Group
2508	Cycling '74
2616	Digital-Tutors
2119	DVS Digital Video, Inc.
2417	EON Reality, Inc.
1828	e-on software, inc.
2206	eyeon Software Inc.
211	Florida Interactive Entertainment Academy
2527	Future Publishing Limited
1211	Immersion Corporation
1214	InterSense
2116	JourneyEd.com
611	Khronos Group
301	Linden Lab
2619	Microsoft Corporation
1518	NewTek, Inc.
1017	NVIDIA Corporation
2408	Okino Computer Graphics, Inc.
2614	PipelineFX, LLC

1728	Purdue University, Department of Computer Graphics Technology
600	Reallusion Inc.
419	REALVIZ S.A.
2629	SeeFile Software LLC
126	syncVUE (Intelligent Gadgets)
823	Virtools SA
1301	Visual Media, LLC
223	Web3D Consortium
2428	Westbridge Film School

Multimedia Tools and Applications-HW

2523	Act-3D, B.V.
404	American Paper Optics, Inc.
2030	Anark Corporation
729	B&H Photo-Video
219	Barco
2119	DVS Digital Video, Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
1211	Immersion Corporation
2308	Immersive Media Corp.
1214	InterSense
1518	NewTek, Inc.
1017	NVIDIA Corporation
626	PNY Technologies, Inc.
2629	SeeFile Software LLC
126	syncVUE (Intelligent Gadgets)
1011	Wacom Technology Corp.
223	Web3D Consortium

Networking Equipment

930	AMAX Information Technologies
815	Ciara Technologies
2620	DataDirect Networks Inc.
1203	Hewlett-Packard Company
2629	SeeFile Software LLC
2519	The3DShop.com

Networking Infrastructure

1527	Blender Foundation, Open Source Pavilion
130	CMG-Collaborative Media Group
2119	DVS Digital Video, Inc.
1203	Hewlett-Packard Company
2629	SeeFile Software LLC
1301	Visual Media, LLC

OEM Components

429	5DT (Fifth Dimension Technologies)
1031	AJA Video Systems Inc.
806	AMD
1513	ATI Technologies Inc.
1523	BOXX Technologies, Inc.
815	Ciara Technologies
130	CMG-Collaborative Media Group
2119	DVS Digital Video, Inc.
1214	InterSense
1503	Motion Analysis Corporation
306	P.I. Engineering, Inc.
2516	Tobii Technology AB

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Paint Systems

2006	Adobe Systems Incorporated
1527	Blender Foundation, Open Source Pavilion
2525	Boris FX
2206	eyeon Software Inc.
2527	Future Publishing Limited
603	MAXON Computer Inc.
1223	Pixologic, Inc.
1201	Toon Boom Animation, Inc.
1301	Visual Media, LLC

Printers and Plotters

2519	The3DShop.com
729	B&H Photo-Video
2527	Future Publishing Limited
1203	Hewlett-Packard Company
109	Solidscape, Inc.
414	Torcomp, Inc.
517	Xerox Corporation

Projectors

2519	The3DShop.com
429	5DT (Fifth Dimension Technologies)
608	Akasaka Natural Vision Research Center
729	B&H Photo-Video
219	Barco
116	Beijing ZhongShiDian Digital Technology Co., Ltd.
2527	Future Publishing Limited
102	Lightspeed Design, Inc.
307	Mitsubishi Electric Research Laboratories

Publications

2302	3D Training Institute (3DTi)
2422	A K Peters, Ltd.
2019	Addison-Wesley Professional
2208	Animation Magazine Inc.
115	ASC-American Cinematographer
406	Ballistic Media Pty. Ltd.
130	CMG-Collaborative Media Group
2219	Computer Graphics World (COP Communications, Inc.)
119	Create Magazine
508	Digital Content Producer
2527	Future Publishing Limited
417	IdN Magazine
508	millimeter
831	The MIT Press
2014	Morgan Kaufmann/Focal Press Publishers
2018	Peachpit Press
2219	Post Magazine (COP Communications, Inc.)

1728	Purdue University, Department of Computer Graphics Technology
2419	Springer
529	Stash Media Inc.
2628	StudentFilmmakers, The Magazine and Online Portal
323	Sybex, An Imprint of Wiley
619	Thomson Course Technology/ Charles River Media
223	Web3D Consortium
2428	Westbridge Film School
2411	Zygote Media Group, Inc.

RAID Systems and Storage

206	1 Beyond, Inc.
2519	The3DShop.com
717	Aberdeen LLC
930	AMAX Information Technologies
729	B&H Photo-Video
2226	BlueArc Corporation
1523	BOXX Technologies, Inc.
815	Ciara Technologies
2131	Ciprico, Inc.
329	CalDigit Inc.
2620	DataDirect Networks Inc.
2119	DVS Digital Video, Inc.
1203	Hewlett-Packard Company
2416	Isilon Systems, Inc.
2629	SeeFile Software LLC
715	snowball VFX
1702	Texas Memory Systems

Rendering and Modeling

2519	The3DShop.com
2302	3D Training Institute (3DTi)
2303	3dMD/3Q
2523	Act-3D, B.V.
2019	Addison-Wesley Professional
2006	Adobe Systems Incorporated
2514	ARTVPS
1513	ATI Technologies Inc.
819	auto.des.sys, Inc.
1713	Avid Technology, Inc.
430	Axceleon Inc.
1527	Blender Foundation, Open Source Pavilion
2624	BlueBoxME
1523	BOXX Technologies, Inc.
2426	Caligari Corporation
1701	cebas Computer GmbH
531	The Center for Digital Imaging Arts at Boston University
130	CMG-Collaborative Media Group
303	Corel Corporation
2400	DAZ Productions, Inc.
131	DigiPen Institute of Technology
2616	Digital-Tutors

2211	e frontier, Inc.
1530	Electronic Arts Inc.
1828	e-on software, inc.
2206	eyeon Software Inc.
2424	FiatLux Corporation/KGT
211	Florida Interactive Entertainment Academy
2527	Future Publishing Limited
215	Great Eastern Technology
2223	Hash, Inc.
1203	Hewlett-Packard Development Company, L.P.
617	Illuminate Labs
1211	Immersion Corporation
2028	InSpeck Inc.
2517	IntegrityWare, Inc.
2116	JourneyEd.com
301	Linden Lab
1717	Lucasfilm Ltd.
603	MAXON Computer Inc.
307	Mitsubishi Electric Research Laboratories
1518	NewTek, Inc.
402	Next Limit Technologies
1017	NVIDIA Corporation
2408	Okino Computer Graphics, Inc.
2018	Peachpit Press
2614	PipelineFX, LLC
1223	Pixologic, Inc.
600	Reallusion Inc.
203	Renderosity
105	Robert McNeel & Associates
408	SensAble Technologies, Inc.
715	snowball VFX
431	Solid Modeling Solutions
109	Solidscape, Inc.
2404	SpheronVR AG
504	Syflex LLC
414	Torcomp, Inc.
2202	Total Immersion
2626	Triple Squid Software Design
108	T-Splines, LLC
1014	VisMasters
1301	Visual Media, LLC
223	Web3D Consortium
2428	Westbridge Film School
132	WorldViz LLC
2411	Zygote Media Group, Inc.

Robotics

2518	I-CubeX
1214	InterSense
423	Meta Motion
1503	Motion Analysis Corporation
408	SensAble Technologies, Inc.
132	WorldViz LLC

Scan Converters

729	B&H Photo-Video
1211	Immersion Corporation

Scanners

2303	3dMD/3Q
2519	The3DShop.com
100	Academic Superstore LP
729	B&H Photo-Video
403	Fork Particle, Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
1211	Immersion Corporation
2028	InSpeck Inc.
2116	JourneyEd.com630 NextEngine Inc.

Scientific Application

2303	3dMD/3Q
608	Akasaka Natural Vision Research Center
430	Axceleon Inc.
1523	BOXX Technologies, Inc.
1828	e-on software, inc.
1211	Immersion Corporation
2116	JourneyEd.com
1023	Massive Software
402	Next Limit Technologies
223	Web3D Consortium
1501	Wolfram Research, Inc.
132	WorldViz LLC

Scientific Visualization

2303	3dMD/3Q
429	5DT (Fifth Dimension Technologies)
2523	Act-3D, B.V.
2030	Anark Corporation
2514	ARTVPS
819	auto.des.sys, Inc.
1706	Autodesk, Inc.
1713	Avid Technology, Inc.
1523	BOXX Technologies, Inc.
2426	Caligari Corporation
2508	Cycling '74
1828	e-on software, inc.
2206	eyeon Software Inc.
2424	FiatLux Corporation/KGT
215	Great Eastern Technology
1203	Hewlett-Packard Company
1211	Immersion Corporation
2517	IntegrityWare, Inc.
1023	Massive Software
603	MAXON Computer Inc.
423	Meta Motion
307	Mitsubishi Electric Research Laboratories
402	Next Limit Technologies
1017	NVIDIA Corporation

408	SensAble Technologies, Inc.
208	TechViz
1301	Visual Media, LLC
223	Web3D Consortium
1501	Wolfram Research, Inc.
132	WorldViz LLC
2411	Zygot Media Group, Inc.

Simulation

2303	3dMD/3Q
429	5DT (Fifth Dimension Technologies)
2523	Act-3D, B.V.
608	Akasaka Natural Vision Research Center
2030	Anark Corporation
1713	Avid Technology, Inc.
430	Axceleon Inc.
219	Barco
1523	BOXX Technologies, Inc.
2426	Caligari Corporation
2613	Craft Animations and Entertainment AB
131	DigiPen Institute of Technology
2616	Digital-Tutors
2417	EON Reality, Inc.
2206	eyeon Software Inc.
617	Illuminate Labs
1211	Immersion Corporation
2308	Immersive Media Corp.
2116	JourneyEd.com
301	Linden Lab
102	Lightspeed Design, Inc.
1023	Massive Software
423	Meta Motion
402	Next Limit Technologies
2130	Ohio University School of Telecommunications
502	Orad Hi Tec Systems Ltd.
1728	Purdue University, Department of Computer Graphics Technology
408	SensAble Technologies, Inc.
504	Syflex LLC
208	TechViz
2202	Total Immersion
1014	VisMasters
223	Web3D Consortium
1501	Wolfram Research, Inc.
132	WorldViz LLC

Storage Devices; Tape/Disk

2519	The3DShop.com
717	Aberdeen LLC
100	Academic Superstore LP
729	B&H Photo-Video
2226	BlueArc Corporation
2131	Ciprico, Inc.
2620	DataDirect Networks Inc.
1203	Hewlett-Packard Company
2416	Isilon Systems, Inc.
2116	JourneyEd.com
715	snowball VFX
1702	Texas Memory Systems

Streaming Technology

2519	The3DShop.com
2006	Adobe Systems Incorporated
2030	Anark Corporation
729	B&H Photo-Video
1527	Blender Foundation, Open Source Pavilion
2416	Isilon Systems, Inc.
2116	JourneyEd.com
301	Linden Lab
1518	NewTek, Inc.
928	Point Grey Research Inc.
2629	SeeFile Software LLC
1702	Texas Memory Systems

Systems Integrators

206	1 Beyond, Inc.
2303	3dMD/3Q
2519	The3DShop.com
429	5DT (Fifth Dimension Technologies)
930	AMAX Information Technologies
729	B&H Photo-Video
219	Barco
130	CMG-Collaborative Media Group
2424	FiatLux Corporation/KGT
1214	InterSense
423	Meta Motion
132	WorldViz LLC

Terminals, Monitors and Displays

2519	The3DShop.com
2302	3D Training Institute (3DTI)
429	5DT (Fifth Dimension Technologies)
729	B&H Photo-Video
219	Barco
209	BrightSide Technologies Inc.
130	CMG-Collaborative Media Group
403	Fork Particle, Inc.
2527	Future Publishing Limited
215	Great Eastern Technology
1203	Hewlett-Packard Company
307	Mitsubishi Electric Research Laboratories

Video Effects Equipment

729	B&H Photo-Video
2119	DVS Digital Video, Inc.
2206	eyeon Software Inc.
403	Fork Particle, Inc.
2527	Future Publishing Limited
1203	Hewlett-Packard Company
2308	Immersive Media Corp.
1214	InterSense
307	Mitsubishi Electric Research Laboratories
1027	MOVA
1518	NewTek, Inc.
1017	NVIDIA Corporation
502	Orad Hi Tec Systems Ltd.
2428	Westbridge Film School

Video Encoding and Compression

206	1 Beyond, Inc.
2519	The3DShop.com
1513	ATI Technologies Inc.
1706	Autodesk, Inc.
1523	BOXX Technologies, Inc.
130	CMG-Collaborative Media Group
131	DigiPen Institute of Technology
2119	DVS Digital Video, Inc.
2527	Future Publishing Limited
2116	JourneyEd.com
611	Khronos Group
307	Mitsubishi Electric Research Laboratories
1518	NewTek, Inc.
1017	NVIDIA Corporation
126	syncVUE (Intelligent Gadgets)
1301	Visual Media, LLC
2428	Westbridge Film School

Video Servers

2519	The3DShop.com
717	Aberdeen LLC
729	B&H Photo-Video
1523	BOXX Technologies, Inc.
130	CMG-Collaborative Media Group
2119	DVS Digital Video, Inc.
1203	Hewlett-Packard Company
102	Lightspeed Design, Inc.
502	Orad Hi Tec Systems Ltd.
2629	SeeFile Software LLC

Visual Effects Software

206	1 Beyond, Inc.
129	2d3 Ltd.
2302	3D Training Institute (3DTi)
2523	Act-3D, B.V.
2019	Addison-Wesley Professional
2006	Adobe Systems Incorporated
113	Andersson Technologies LLC
819	auto.des.sys, Inc.
1706	Autodesk, Inc.
1713	Avid Technology, Inc.
729	B&H Photo-Video
116	Beijing ZhongShiDian Digital Technology Co., Ltd.
1527	Blender Foundation, Open Source Pavilion
2525	Boris FX
531	The Center for Digital Imaging Arts at Boston University
303	Corel Corporation
2613	Craft Animations and Entertainment AB
2508	Cycling '74
131	DigiPen Institute of Technology
1231	Digital Domain, Inc./D2 Software, Inc.
2616	Digital-Tutors
1828	e-on software, inc.
2206	eyeon Software Inc.
211	Florida Interactive Entertainment Academy

403	Fork Particle, Inc.
2527	Future Publishing Limited
1700	GenArts, Inc.
215	Great Eastern Technology
2223	Hash, Inc.
1203	Hewlett-Packard Company
2116	JourneyEd.com
611	Khronos Group
1717	Lucasfilm Ltd.
1023	Massive Software
603	MAXON Computer Inc.
307	Mitsubishi Electric Research Laboratories
1027	MOVA
125	New York Film Academy
1518	NewTek, Inc.
402	Next Limit Technologies
1017	NVIDIA Corporation
502	Orad Hi Tec Systems Ltd.
2018	Peachpit Press
2614	PipelineFX, LLC
419	REALVIZ S.A.
203	Renderosity
1731	Side Effects Software Inc.
715	snowball VFX
1506	Sony Pictures Imageworks Inc.
504	Syflex LLC
414	Torcomp, Inc.
2202	Total Immersion
1301	Visual Media, LLC
223	Web3D Consortium
2428	Westbridge Film School
606	wondertouch, LLC
2411	Zygote Media Group, Inc.

VR Software

429	5DT (Fifth Dimension Technologies)
2523	Act-3D, B.V.
2030	Anark Corporation
1713	Avid Technology, Inc.
219	Barco
116	Beijing ZhongShiDian Digital Technology Co., Ltd.
130	CMG-Collaborative Media Group
2417	EON Reality, Inc.
2424	FiatLux Corporation/KGT
2527	Future Publishing Limited
1211	Immersion Corporation
1214	InterSense
301	Linden Lab
423	Meta Motion
307	Mitsubishi Electric Research Laboratories
1503	Motion Analysis Corporation
419	REALVIZ S.A.
408	SensAble Technologies, Inc.
208	TechViz
823	Virtools SA
1301	Visual Media, LLC
223	Web3D Consortium
132	WorldViz LLC

Web 3D

2519	The3DShop.com
2302	3D Training Institute (3DTi)
2303	3dMD/3Q
100	Academic Superstore LP
2523	Act-3D, B.V.
2019	Addison-Wesley Professional
404	American Paper Optics, Inc.
2030	Anark Corporation
2514	ARTVPS
1513	ATI Technologies Inc.
2624	BlueBoxME
2525	Boris FX
1523	BOXX Technologies, Inc.
2426	Caligari Corporation
1701	cebas Computer GmbH
531	The Center for Digital Imaging Arts at Boston University
130	CMG-Collaborative Media Group
2400	DAZ Productions, Inc.
2616	Digital-Tutors
2211	e frontier, Inc.
1530	Electronic Arts Inc.
2417	EON Reality, Inc.
1828	e-on software, inc.
2206	eyeon Software Inc.
211	Florida Interactive Entertainment Academy
2527	Future Publishing Limited
215	Great Eastern Technology
1203	Hewlett-Packard Company
617	Illuminate Labs
1211	Immersion Corporation
2028	InSpec Inc.
2517	IntegrityWare, Inc.
2116	JourneyEd.com
301	Linden Lab
603	MAXON Computer Inc.
423	Meta Motion
2619	Microsoft Corporation
630	NextEngine Inc.
2408	Okino Computer Graphics, Inc.
2018	Peachpit Press
419	REALVIZ S.A.
203	Renderosity
105	Robert McNeel & Associates
431	Solid Modeling Solutions
414	Torcomp, Inc.
823	Virtools SA
1014	VisMasters
1301	Visual Media, LLC
223	Web3D Consortium
2428	Westbridge Film School

Web Graphics

2519	The3DShop.com
2302	3D Training Institute (3DTI)
2523	Act-3D, B.V.
2019	Addison-Wesley Professional
2006	Adobe Systems Incorporated
2030	Anark Corporation
1513	ATI Technologies Inc.
2624	BlueBoxME
2525	Boris FX
1523	BOXX Technologies, Inc.
130	CMG-Collaborative Media Group
2400	DAZ Productions, Inc.
2616	Digital-Tutors
1530	Electronic Arts Inc.
2417	EON Reality, Inc.
2206	eyeon Software Inc.
211	Florida Interactive Entertainment Academy

2527	Future Publishing Limited
2116	JourneyEd.com
2619	Microsoft Corporation
2408	Okino Computer Graphics, Inc.
2018	Peachpit Press
1728	Purdue University, Department of Computer Graphics Technology
600	Reallusion Inc.
419	REALVIZ S.A.
203	Renderosity
2629	SeeFile Software LLC
531	The Center for Digital Imaging Arts at Boston University
1201	Toon Boom Animation, Inc.
414	Torcomp, Inc.
616	Vertus
1301	Visual Media, LLC
223	Web3D Consortium

Workstations

206	1 Beyond, Inc.
2519	The3DShop.com
717	Aberdeen LLC
930	AMAX Information Technologies
806	AMD
1513	ATI Technologies Inc.
729	B&H Photo-Video
1523	BOXX Technologies, Inc.
815	Ciara Technologies
2219	Computer Graphics World (COP Communications, Inc.)
2119	DVS Digital Video, Inc.
2527	Future Publishing Limited
215	Great Eastern Technology
1203	Hewlett-Packard Company
111	IBM Corporation
1518	NewTek, Inc.
1017	NVIDIA Corporation
502	Orad Hi Tec Systems Ltd.

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General Information

SIGGRAPH 2006 and the Boston Convention & Exhibition Center provide all the support and convenience you need for a successful conference experience.

Accessibility

The convention center is handicap accessible. If you have special needs or requirements, please call Conference Management at: **+1.617.954.3738**

Boston Convention & Exhibition Center
415 Summer Street
Boston, Massachusetts 02210

Age Requirement Policies

- Registered attendees under the age of 16 must be accompanied by an adult at all times.
- Children under 16 are not permitted in the Exhibition. Age verification is required.

Airport Shuttle Transportation

The following companies offer shuttle-bus service from Logan International Airport to downtown Boston hotels. Please contact each company directly for pricing and pickup/drop off information, and to make advance reservations.

JC Transportation/Ace American
+1.781.598.3433
800.517.2281

City Transportation
+1.617.561.9000

Star Shuttle, Inc.
+1.617.230.6005

Audio/Visual Services

+1.617.954.3734

Complete audio/visual services for SIGGRAPH 2006 presenters are available in the Speaker Prep Room, Hall B2 (front of the Hall), **+1.617.954.3765**.

Automated Teller Machines (ATMs)

There are several ATMs located throughout the lobbies of the Boston Convention & Exhibition Center.

Baggage Check

Outside Room 155 and Main Lobby

Baggage check service is available for briefcases, backpacks, and other small items during conference hours for \$2 per bag. SIGGRAPH 2006 is not responsible for items provided to Baggage Check.

Outside Room 155 (near escalator)

Sunday, 30 July	8:30 am – 7:30 pm
Monday, 31 July	7:30 am – 6:30 pm
Tuesday, 1 August	7:30 am – 6:30 pm
Wednesday, 2 August	7:30 am – 6:30 pm
Thursday, 3 August	7:30 am – 6:30 pm

Main Lobby

Wednesday, 2 August	7:30 am – 6:30 pm
Thursday, 3 August	7:30 am – 6:30 pm

Bookstore

Hall B Lobby

BreakPoint Books offers the latest and greatest books, CDs, and DVDs on computer animation, graphic design, gaming, 3D graphics, modeling, and digital artistry. The bookstore features recent books by SIGGRAPH 2006 speakers and award winners.

Sunday, 30 July	9 am – 7 pm
Monday, 31 July	8 am – 6 pm
Tuesday, 1 August	8 am – 6 pm
Wednesday, 2 August	8 am – 6 pm
Thursday, 3 August	8 am – 6 pm

Note: Bookstore refunds will only be processed during the conference. All bookstore policies are those of BreakPoint Books and not SIGGRAPH 2006.

See the schedule in the bookstore for book signings throughout the week.

Business Center

Main Lobby

The FedEx Kinkos offers faxing, copying, shipping/receiving, office supplies, internet access, and computer rental.

Saturday, 29 July – 3 August
8 am – 5 pm

Busing

See Shuttle Services.

Camera/Recording Policy

No cameras or recording devices are permitted at SIGGRAPH 2006. Abuse of this policy will result in the loss of the individual's registration credentials.

Child Care

Important Notice: Child Care will not be provided at SIGGRAPH 2006. Contact your hotel concierge for suggestions.

Conference Management Office

Room 153AB
+1.617.954.3738

If you have questions regarding SIGGRAPH 2006, call or stop by this office anytime during conference hours.

Conference Policies

SIGGRAPH 2006 reserves the right to deny registration or entrance to any attendee or prospective attendee, and to cancel an existing registration, if it determines that a registration or an attendee is not in the best interest of SIGGRAPH 2006 or ACM SIGGRAPH.

Currency Exchange

Attendees can exchange foreign currency at Logan International Airport (Travellex offices in Terminals A, B, C and E) and two locations in downtown Boston.

Anglo Irish Bank Corporation

84 State Street, #4
+1.617.720.2577

Travellex Canada Limited

745 Boylston Street
+1.617.266.7560

Exhibition Management Office

Room 154
+1.617.954.3745

Exhibition Management representatives are available during conference hours to meet with exhibitors and help with plans for exhibiting at SIGGRAPH 2006.

Exhibitor Registration

Hall B1

Open during registration hours. See Registration.

First Aid Office

Main Lobby Hallway

Nurses and paramedics are on duty during conference hours.

Food Services

West Side, Level 1

The Boston Convention & Exhibition Center operates several restaurants, concessions, and food carts throughout the convention center for the convenience of SIGGRAPH 2006 attendees.

Food Court Days & Hours

Saturday, 29 July 9am – 3pm
Sunday, 30 July –
Thursday, 3 August 8am – 6pm

Housing Desk

Hall B1
+1.617.954.3747

Complete information about SIGGRAPH 2006 hotel accommodations. Open during registration hours. See Registration.

Information and Restaurant Desk

Main Lobby

General Information about Boston and concierge services for reservations at Boston restaurants and clubs.

Saturday, 29 July	2 – 8 pm
Sunday, 30 July	7:30 am - 4 pm
Monday, 31 July	7:30 am - 4 pm
Tuesday, 1 August	7:30 am - 6 pm
Wednesday, 2 August	7:30 am - 6 pm
Thursday, 3 August	7:30 am - 5 pm

International Center

Hall B Lobby

The SIGGRAPH 2006 International Committee and a multi-lingual staff of student volunteers answer questions, offer suggestions, provide informal translation services, and make connections with international attendees.

Saturday, 29 July	6 – 8 pm
Sunday, 30 July	8 am - 6 pm
Monday, 31 July	8 am - 6 pm
Tuesday, 1 August	8 am - 6 pm
Wednesday, 2 August	8 am - 6 pm
Thursday, 3 August	8 am - 5 pm

Internet Access Kiosks

Free wireless access is available for SIGGRAPH 2006 throughout the Boston Convention & Exhibition Center (BCEC). SIGGRAPH 2006 will not provide public workstations for internet access. There is limited internet access in the FedEx Kinkos located in the BCEC.

Job Fair

Hall B1

Tuesday, 1 August - Thursday, 3 August
10 am - 4 pm

The Job Fair is produced by CreativeHeads.net. New technology, features, and benefits have been added to assist active jobseekers or casual networkers connect with employers during SIGGRAPH 2006. The Job Fair is open to all SIGGRAPH 2006 attendees at no additional cost.



CREATIVEHEADS.NET®
JOBS FOR THE RIGHT BRAINS

Job Fair Participants (as of 14 June)

Name	Booth #
Apple Computer, Inc.	7
Activision	16
ATI Technologies Inc.	40
BioWare Corp.	41
Blue Fang Games	35
Blizzard Entertainment	60, 61, 62
CreativeHeads.net	63
Cryptic Studios	32
Double Negative Visual Effects	37
Eidos/Crystal Dynamics	36
Emergent Game Technologies	58
Factor 5	18
Framestore CFC	57
Full Sail Real World Education	9
Harmonix Music Systems Inc.	15
Helixe Studios	7
High Moon Studios	60, 61, 62
High Voltage Studios	50
Incredible Technologies	43
Insomniac Games	23
Kaos Studios	7
LAIKA	21
Mad Doc Software	19
Microsoft Game Studios/Xbox	6
Midway	1
Naughty Dog, Inc.	38
Nintendo of America Inc.	5
NVIDIA	59
Perpetual Entertainment	22
Polygon Pictures Inc.	20
Radical Games	60, 61, 62
Rainbow Studios	7
Red 5	42
Savannah College of Art and Design	24
Sony Computer Entertainment America	3, 4
Sony Online Entertainment	33
Sony Pictures Imageworks	33
The Art Institute Online	34
THQ	7
Turbine Inc.	39
Speedshape	8
Virtual Heroes	2
Vanguard Animation	25
Vicarious Visions	17
Vivendi Games	60, 61, 62

Lost and Found

North Lobby Security Post

After the conference, all lost-and-found items will be kept by the BCEC Security Command Center for approximately 90 days. After 90 days, the lost items will be disposed of or turned over to the person who found the item(s). To inquire about lost items during and after the conference, call security at +1.617.954.2217. Lost registration badges can be claimed at the Special Assistance Office in Registration (Hall B1).

Merchandise Pickup Center

Hall B1

Your conference documentation (included with registration) must be picked up at the Merchandise Pickup Center. Technical materials and conference documentation will not be shipped, nor will refunds be given for any material that is not picked up at the Merchandise Pickup Center in Hall B1. The Pickup Center will be open during registration hours.

Message Center

Hall B Lobby

Kiosks where attendees leave and retrieve notes and requests.

Parking

+1.617.954.2230

SIGGRAPH 2006 attendees can park at the rear of the Boston Convention & Exhibition Center for \$10 per day (self parking) in the South Lot. There is also valet parking for \$20 per day in front of the convention center. There are no in/out privileges for self or valet parking.

Pathfinders

Hall B1

Special assistance for first-time SIGGRAPH conference attendees. Let us help you navigate your way through SIGGRAPH 2006. Feedback always welcome at: pathfinders@siggraph.org

Registration

Hall B1

Saturday, 29 July	6 - 8 pm
Sunday, 30 July	8 am - 6 pm
Monday, 31 July	8 am - 6 pm
Tuesday, 1 August	8 am - 6 pm
Wednesday, 2 August	8 am - 6 pm
Thursday, 3 August	8 am - 3:30 pm

Special Assistance Desk

Hall B1

Assistance with a wide range of problems and concerns, including:

- Credit card problems (validations, errors)
- Lost badges
- Registration corrections and upgrades
- Substitute registration
(only if authorized on company letterhead)

Shipping

Main Lobby

The FedEx Kinkos offers complete shipping services for your merchandise, and other conference materials. They provide next-day air, second-day air, and regular ground shipping services to destinations throughout the world.

Shuttle Service

+1.410.507.0971

SIGGRAPH 2006 provides complimentary shuttle service between most conference hotels, the Boston Convention & Exhibition Center, and to/from the SIGGRAPH 2006 reception (excluding the Westin Waterfront and Seaport Hotel due to their close proximity). Look for signs and shuttle flyers with specific shuttle details for all events in conference hotel lobbies and the information desk at the BCEC.

If you have any shuttle-related questions, please contact the shuttle service desk during official shuttle hours. For assistance with handicap service, please call +1.410.507.0971. SIGGRAPH 2006 provides shuttles with wheel chair lifts and tie-downs.

NEW THIS YEAR:

Shuttle service is available only to attendees who register at official conference hotels through the SIGGRAPH 2006 hotel reservation system. Those attendees will receive special wristbands that allow them to board the shuttle buses. Attendees who are not registered at official conference hotels will be allowed to purchase wristbands in the SIGGRAPH Store located in Hall B Lobby. Attendees without wristbands will not be allowed to use the shuttle service.

Shuttle Service Hours

Saturday, 29 July	5 pm - 8:30 pm
Sunday, 30 July	7:30 am - 8:30 pm
Monday, 31 July	7:30 am - 9:30 pm
Tuesday, 1 August	7:30 am - 9:30 pm
Wednesday, 2 August	7:30 am - 9:45 pm
Thursday, 3 August	7:30 am - 6:30 pm

Hotel shuttle service will pick up and drop off attendees at the Northeast Lower Level 0 of the BCEC.

SIGGRAPH Store

Hall B Lobby

+1.617.954.3764

SIGGRAPH Boutique

Main Lobby

For casual browsers and serious shoppers. Review and purchase additional technical materials, conference documentation, and gifts (t-shirts, polo shirts, hoodies, and coffee mugs) for friends, family, and colleagues. SIGGRAPH 2006 merchandise is available on a first-come, first-served basis.

Note: The Boutique will be closed on Saturday.

Sunday, 30 July	8 am - 6 pm
Monday, 31 July	8 am - 6 pm
Tuesday, 1 August	8 am - 6 pm
Wednesday, 2 August	8 am - 6 pm
Thursday, 3 August	8 am - 6 pm

Participation in SIGGRAPH 2007

You are encouraged to participate by submitting your work and volunteer application to SIGGRAPH 2007 programs. Stop by the SIGGRAPH 2007 Booth in Hall B Lobby. All questions and comments are welcome.

Speaker Prep Room

Hall B2 (front of the hall)

+1.617.954.3765

First, go to the contributor registration desk to pick up your registration credentials and conference information. Then go to the Speaker Prep Room to prepare your presentation. Speaker ribbons and badge holders are available only in the Speaker Prep Room. If you're presenting at the conference, you should check in at the Speaker Prep Room at least 24 hours before your presentation.

In the Speaker Prep Room, presenters preview slides and videotapes, sort slides, obtain slide carousels, and arrange for all their audio/visual needs in their presentation rooms.

Saturday, 29 July	noon - 7 pm
Sunday, 30 July	7 am - 7 pm
Monday, 31 July	7 am - 7 pm
Tuesday, 1 August	7 am - 7 pm
Wednesday, 2 August	7 am - 7 pm
Thursday, 3 August	7 am - 2 pm

Technical Material Sold After the Conference

Full Conference DVD-ROM

This digital publication contains the electronic version of the technical papers, images, and supplemental material; all of the course and tutorial notes, including supplemental material (movies, source code, HTML presentations); and the permanent record of the Educators Program, Emerging Technologies, Panels, Sketches, Research Posters, Special Sessions, and Teapot Exhibit; along with the permanent record of the Art Gallery: *Intersections* and Computer Animation Festival and ACM SIGGRAPH awards.

ACM Transactions on Graphics (Conference Proceedings special issue) – Printed

Contains the SIGGRAPH 2006 technical papers and the ACM SIGGRAPH awards.

Conference Select CD-ROM

This digital publication contains the permanent record of the Art Gallery: *Intersections* and Computer Animation Festival and the electronic version of the Educators Program, Emerging Technologies, Panels, Sketches, Research Posters, Special Sessions, the Teapot Exhibit and the ACM SIGGRAPH awards. Papers and Courses are available only on the Full Conference DVD-ROM.

Electronic Art & Animation Catalog – Printed

Contains the permanent record of images from the Art Gallery: *Intersections* and the Computer Animation Festival.

SIGGRAPH 2006 Video Review

Contains animations presented in the Electronic Theater and Animation Theaters. To order these materials after the conference, contact:

ACM Order Department

800.342.6626 (Continental US and Canada)
+1.212.626.0500 (International)
+1.212.944.1318 fax
orders@acm.org

Ticket Sale and Exchange Booth Hall B1

Electronic Theater Tickets

One ticket is included with each Full Conference and Conference Select registration. Additional tickets cost \$50. Every attempt is made to accommodate your requested Electronic Theater show. If you want to exchange your ticket, go to the Ticket Sales and Exchange Booth. Tickets are not available for every show. All Electronic Theater performances contain the same material. Badged attendees may purchase up to two additional Electronic Theater tickets (subject to availability) at On-Site Registration beginning at 6 pm Saturday, 29 July. Last-minute tickets are generally available. They will be sold at the door to the Electronic Theater one hour prior to show time. All sales are final.

Reception Ticket

Reception tickets are also available at the Ticket Sales & Exchange Booth. The cost is \$40 per person. All sales are final.

Telephone Numbers

Audio/Visual Services

+1.617.954.3734

Conference Management Office

+1.617.954.3738

Exhibition Management Office

+1.617.954.3745

Housing Desk

+1.617.954.3747

Media Headquarters

+1.617.954.3749

Parking – Boston Convention & Exhibition Center

+1.617.954.2230

Security Office

+1.617.954.2217

Shuttle Service

+1.410.507.0971

SIGGRAPH Store

+1.617.954.3764

Speaker Prep Room

+1.617.954.3765

Transportation Options

Taxis

Taxis are available around the clock from Logan Airport. It takes about 20-25 minutes from Logan Airport to the SIGGRAPH 2006 hotels in the Back Bay area. Fares are approximately \$18-25.

Subway Transportation

Free shuttle bus service runs between airline terminals and the T (subway system). The shuttle operates daily from 5:30 am to 1 am with departures every 8-12 minutes.

Wireless Internet Access

SIGGRAPH 2006 provides 802.11b/g wireless network access in all areas of the Boston Convention & Exhibition Center. To use the wireless network, attendees should have their own wireless (802.11b/g) cards.

Please refer to your laptop operating system and client adapter documentation and follow this procedure:

1. Document all existing TCP/IP and wireless configuration information before you make any changes.
2. Configure your laptop to use DHCP.
3. Configure your wireless adapter Network Name (SSID) to be "BCEC Wireless Network".
4. Disable encryption on your wireless adapter.

The SIGGRAPH 2006 wireless network provides open, unencrypted communications for conference attendees. The system is not secure and can be monitored by others.

Hotels

as of 24 June, 2006 For a complete list of hotels, visit: www.siggraph.org/s2006

A 12.45% tax per night is added to all hotel bills in Boston. Room occupancy taxes are subject to change. Early departure fees may apply.

- 1 Boston Marriott Copley Place Headquarters Hotel**
110 Huntington Avenue
Boston, Massachusetts 02116
+1.617.236.5800; +1.617.236.5885 fax
- 2 Boston Park Plaza**
64 Arlington Street
Boston, Massachusetts 02116
+1.617.426.2000; +1.617.426.5545 fax
- 3 Boston University Dormitories**
The 10 Buick Street Residence
10 Buick Street
Boston, Massachusetts 02215
+1.617.358.0657
- 4 The Colonnade Hotel Boston**
120 Huntington Avenue
Boston, Massachusetts 02116
+1.617.424.7000; +1.617.424.1717 fax
- 5 Courtyard Tremont Boston Hotel**
275 Tremont Street
Boston, Massachusetts 02116
+1.617.426.1400; +1.617.482.6730 fax
- 6 Doubletree Club Hotel Boston - Bayside**
240 Mt. Vernon Street
Boston, Massachusetts 02125
+1.617.822.3600; +1.617.822.2865 fax
- 7 Doubletree Hotel Boston - Downtown**
821 Washington Street
Boston, Massachusetts 02111
+1.617.956.7900; +1.617.956.7901 fax
- 8 Embassy Suites Boston at Logan Airport**
207 Porter Street
Boston, Massachusetts 02111
+1.617.567.5000; +1.617.567.5999 fax
- 9 Hampton Inn**
811 Massachusetts Avenue
Roxbury, Massachusetts 02118
+1.617.445.6400; +1.617.445.6411 fax
- 10 Hilton Boston Back Bay**
40 Dalton Street
Boston, Massachusetts 02115
+1.617.236.1100; +1.617.867.6104 fax
- 11 Hilton Boston Financial District**
(formerly the Wyndham)
89 Broad Street
Boston, Massachusetts 02110
+1.617.556.0006; +1.617.556.0053 fax
- 12 Hyatt Regency Boston Financial**
One Ave de Lafayette
Boston, Massachusetts 02111
+1.617.912.1234; +1.617.451.2198 fax
- 13 Omni Parker House**
60 School Street
Boston, Massachusetts 02108
+1.617.227.8600; +1.617.742.5729 fax
- 14 Radisson Hotel**
200 Stuart Street
Boston, Massachusetts 02116
+1.617.482.1800; +1.617.451.2750 fax
- 15 Seaport Hotel**
One Seaport Lane
Boston, Massachusetts 02210
+1.617.385.4000; +1.617.385.4001 fax
- 16 Sheraton Boston**
39 Dalton Street
Boston, Massachusetts 02199
+1.617.236.2000; +1.617.236.1702 fax
- 17 Westin Boston Waterfront**
425 Summer Street
Boston, Massachusetts 02210
+1.617.532.4600; +1.617.532.4630 fax
- 18 Westin Copley Place**
10 Huntington Avenue
Boston, Massachusetts 02116
+1.617.262.9600; +1.617.424.7483 fax

Map of Boston Hotels



Hotels		Closest Subway Stations	
1	Boston Marriott Copley Place Headquarters Hotel	G / Prudential; O Back Bay	
2	Boston Park Plaza	G / Arlington	
3	Boston University Dormitories	G / St. Paul / Boston University West	
4	The Colonnade Hotel Boston	G / Prudential	
5	Courtyard Tremont Boston Hotel	O / New England Medical Center	
6	Doubletree Club Hotel Boston - Bayside	R / JFK	
7	Doubletree Hotel Boston - Downtown	O / New England Medical Center	
8	Embassy Suites Boston at Logan Airport	B / Airport	
9	Hampton Inn	S / Massachusetts Avenue	
10	Hilton Boston Back Bay	G / Hynes Convention; R / Prudential	
11	Hilton Boston Financial District	O B / State Street; B / Aquarium	
12	Hyatt Regency Boston Financial (formerly the Wyndham)	O / Chinatown; O R / Downtown Crossing	
13	Omni Parker House	G R / Park Street; O B / State Street	
14	Radisson Hotel	O / New England Medical Center; G / Arlington	
15	Seaport Hotel	S / World Trade Center	
16	Sheraton Boston	G / Hynes Convention / Prudential	
17	Westin Boston Waterfront	S / World Trade Center	
18	Westin Copley Place	G / Copley; O / Back Bay	

Hotels booked as of 24 June.

- O** Orange Line
- G** Green Line
- B** Blue Line
- S** Silver Line
- R** Red Line

When traveling to the convention center, stand on the "In Bound" side of the subway platform. When traveling back to the hotel from the convention center, stand on the "Out Bound" side of the subway platform. It costs **\$1.25*** to ride the subway.

* Fare subject to change.

Registration and Media Information

Member Rate

If you are currently an ACM or ACM SIGGRAPH member you are eligible for member discounts. You must provide your current ACM or ACM SIGGRAPH membership number in order to receive the discount, otherwise, you will be charged the non-member rate. Local or regional ACM SIGGRAPH memberships are not eligible for registration discounts.

Student Rate

You must be a full-time student in order to qualify. You must provide the following to qualify for student rates (this applies for those registering in advance as well as at the conference):

- Your 2006 ACM student membership number

Failure to provide valid information will result in you being charged the non-member rate.

Note: Your badge will include your name, organization, city, state, and country as indicated on your registration form.

Registration

Hall B1

Saturday, 29 July	6 – 8 pm
Sunday, 30 July	8 am – 6 pm
Monday, 31 July	8 am – 6 pm
Tuesday, 1 August	8 am – 6 pm
Wednesday, 2 August	8 am – 6 pm
Thursday, 3 August	8 am – 3:30 pm

Media Headquarters

Room 151

Saturday, 29 July	5 – 7 pm
Sunday, 30 July	8 am – 4 pm
Monday, 31 July	8 am – 5 pm
Tuesday, 1 August	8 am – 5 pm
Wednesday, 2 August	9 am – 5 pm
Thursday, 3 August	9 am – 4 pm

Media Registration

Media representatives must register in the Media Headquarters Office, Room 151. You must submit full and proper media credentials for a media pass. No exceptions will be made.

Media Briefing/ Exhibition Floor Tour

The official SIGGRAPH media briefing provides an update to media on what's new and what's hot at SIGGRAPH 2006. Preview the Computer Animation Festival and receive insight into the SIGGRAPH 2006 presentations and experiences. Gain access to the exhibit floor before it opens to the attendees for a "sneak preview" of the latest products and applications.

Media Briefing

Tuesday, 1 August
Room 108
8 – 8:45 am

Early Exhibition Floor Access

Tuesday, 1 August
8:45 – 9:30 am
Exhibit Floor

Exhibitor Media Events

A schedule of various exhibitor media events will be available in the Media Headquarters Office in Room 151 of the Boston Convention & Exhibition Center.

Documentation

- Full Conference DVD-ROM*
 - Conference Select CD-ROM**
- *ACM *Transaction on Graphics* (Conference Proceedings Special Issue) and Electronic Art & Animation Catalog can be included depending on your level or registration.
- **The Electronic Art & Animation Catalog can be included depending on your level of registration.

Presentations

- Courses
- Papers
- Panels
- Sketches
- Research Posters
- Educators Program
- Keynote Address/Award
- Special Sessions
- Exhibitor Tech Talks
- Special Events

Experiences

- Art Gallery: Intersections
- Computer Animation Festival
- Electronic Theater Ticket - Any Show
- Electronic Theater Matinée Ticket
- Animation Theaters
- Emerging Technologies
- Guerilla Studio
- Reception
- Teapot Exhibit

Services

- Birds of a Feather
- Get Involved
- International Resources
- Job Fair
- Pathfinders

Committees

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Sketches

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Special Sessions

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Student Volunteers

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Teapot Exhibit

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Social Science and Humanities Research Council of
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Sony Electronics
The Advanced Computing Center for the Arts and
Design, The Ohio State University
The Manchester Metropolitan University
The Ohio State University and the College of the Arts
The School of the Art Institute of Chicago
The University of Oklahoma
TRIAD New Media Gallery
University of Massachusetts Dartmouth Foundation
University of Salford, UK
Wanganui School of Design

Computer Animation Festival

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Autodesk, Inc.
BlueArc Corporation
Boxx Technologies
Cinematrix Interactive Entertainment Systems
E Frontier
Extreme Networks
Intel Corporation
Interconnections Inc.
KVK Electric
Maximum Throughput
Microsoft Corporation
Ordigraphe Inc.
Sony
Sony Pictures
Sony Pictures Imageworks
Technicolor Creative Services
The Xine Project
Toon Boom Animation Inc.
Ubuntu Linux

Courses

Industrial Light & Magic
Microsoft Corporation

Educators Program

Middle Tennessee State University
Pixar

Emerging Technologies

Advanced Micro Devices, Inc.
EDS
Sony Electronics
Walt Disney Parks and Resorts

Fashion Show

Massachusetts Institute of Technology Media Lab
The New York Times Company

GraphicsNet

Blackmagic Design
Cisco
Fluke Networks

Guerilla Studio

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AltAI at Arizona State University
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Auto.des.sys, Inc.
Bardo Industries
Bauhaus Inc.
Breathing Color, Inc.
Cakewalk
Charles River Media
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College of Design, Herberger Center for
Design Research, Arizona State University
Cone Editions Press
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GretagMacbeth AG
Groveland Software Labs, Inc.
Hahnemühle FineArt
Hexagram - Concordia University
ImagePrint v6 - ColorByte Software
Ink Aid
Intel Corporation
Kaidan
Kathy Beal
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Knowledge Adventure
Konica-Minolta
Kumkum Nadig
Larry Danque
Luxology
Lyn Bishop
Materialise
MAXON Computer, Inc.
Ministry of Information and Communication of
South Korea
NewTek
NVIDIA Corporation
Optix XR2 - X-Rite Corporation
Penn State Altoona
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PhaseSpace Motion Capture
Pixologic, Inc.
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PRISM at Arizona State University
Psymbiote
Raindrop Geomagic, Inc.
Realviz S.A.
Red River Paper
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Rigel Instruments, Ltd.
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Purdue University
S.W.A.M.P
School of Art at Arizona State University
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Sensing Places
SintheteX
Softimage Co.
Solidscape
Sony Electronics
Srishti School of Art, Design and Technology
Stratasys, Inc.
Synthetik Software, Inc.
Syracuse University
Temple University, Tyler School of Art
The Art Institute of Philadelphia
The Pennsylvania State University
Toonboom Animation, Inc.
Universal Laser Systems, Inc.
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University of Southern California
Vassar College
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XS Labs
Z Corporation

International

Bergen County Academies
University of Bristol

Panels

Electronic Arts

Papers

Harvard University
Microsoft Corporation
Mitsubishi Electric Research Laboratories (MERL)
Pixar Animation Studios
Yale University

Pathfinders

Advanced Micro Devices, Inc.
Case Western Reserve University
North Carolina State University
The OPAL Group

Sketches

Advanced Micro Devices, Inc.
Mitsubishi Electric Research Laboratories (MERL)
Scientific Computing and Imaging Institute,
University of Utah

Special Sessions

The New York Times Company

Student Mentoring

Massachusetts Institute of Technology

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Advanced Micro Devices, Inc.
Alienware Corp.
Anark Corporation
Animal Logic
Animation Magazine
Archvision
AVID
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Caligari Corporation
Computer Graphics World
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Extensis, Inc.
Gnomon
Hash, Inc.
Industrial Light & Magic
Janimation
John Wiley & Sons, Inc.
JourneyEd.com
Logitech / 3dconnexion
MAXON Computer, Inc.
Maya training center
Midway
NewRiders/Peachpit Press
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O'Reilly Media, Inc.
Pixar Animation Studios
Pixologic
PNY Technologies
Rhythm & Hues Studios
Sensable technology
Softimage Co.
Sony Pictures Imageworks
Sybex Publishing
The Walt Disney Company
Wacom Technology Corporation

Teapot Exhibit

Kamm Foundation
Middle Tennessee State University
University of Utah
Upton Tea Imports

General

Monterey Bay Aquarium Research Institute
New York Institute of Technology
Purdue University
Purdue University College of Technology at New Albany
Purdue University College of Technology at South Bend
Research Institute for Digital Media
and Content, Keio University
WIDE Project

ACM SIGGRAPH Organization

ACM SIGGRAPH

In the span of 30 years, ACM SIGGRAPH has grown from a handful of computer graphics enthusiasts to a diverse group of researchers, artists, developers, filmmakers, scientists, and other professionals who share an interest in computer graphics and interactive techniques. Our community values excellence, passion, integrity, volunteerism, and cross-disciplinary interaction. We sponsor not only the annual SIGGRAPH conference, but also focused symposia, chapters in cities throughout the world, awards, grants, educational resources, online resources, a public policy program, traveling art show, and the SIGGRAPH Video Review.

Membership

The SIGGRAPH community depends on your support. Please help by joining ACM SIGGRAPH for \$35 per year (\$28 per year for students and Eurographics members). In recognition of their support, members receive the Computer Graphics quarterly online, discounted registrations for the annual conference and all other ACM SIGGRAPH sponsored programs, and access to the archive of SIGGRAPH Proceedings in the ACM Digital Library. For more details on membership or to join online, visit www.siggraph.org and select "Membership."

ACM

ACM SIGGRAPH's parent organization is ACM, the Association for Computing Machinery. ACM delivers resources that advance computing as a science and a profession, and is widely recognized as the premier organization for computing professionals. ACM serves as an umbrella organization for information-technology professionals and students, and ACM SIGGRAPH members may also join ACM. Benefits of adding ACM membership include discounts on cutting-edge magazines, journals, books, conferences, access to free, unlimited courses from the Professional Development Centre as well as job search and workplace tips in the Career Resource Centre. ACM members may subscribe to the ACM Digital Library, and receive full access to the Guide to Computing Literature which features more than 850,000 bibliographic citations from the vast world of computing. ACM membership also includes subscriptions to ACM's popular email alert news digests TechNews and CareerNews, and the online newsletter MemberNet. For more information, see: www.acm.org

Professional & Student Chapters

Chapters of ACM SIGGRAPH exist in 70 cities in 16 countries around the world. They form an international multi-cultural network of people who develop, share, continue, and extend the work and achievements presented at the annual conference. Chapter members include those involved in research, development, education, art, gaming, visualization, and entertainment, just to name a few. Student chapters have been chartered in 10 schools. These groups host activities on their campuses that highlight computer graphics and interactive techniques. For more information about the ACM SIGGRAPH network of chapters, or if you would like to start a Professional or Student Chapter, visit: chapters.siggraph.org

Education Program

ACM SIGGRAPH supports both computer graphics education and the use of computer graphics in education with curriculum studies, a web site for educators, and other educational projects. The ACM SIGGRAPH Education booth features SPACE (a juried exhibition of student animations and posters, and a display of student slides submitted by faculty from around the world) and SPICE, a juried exhibition of student web-based projects. For more information, see: www.siggraph.org/education

Symposia

ACM SIGGRAPH helps organize and sponsor focused conferences, workshops, and other symposia around the world on topics related to computer graphics and interactive techniques. These gatherings enable groups with specific interests to get together and exchange information. To see the list of symposia or find out how to get help for a conference you'd like to organize, stop by the ACM SIGGRAPH booth or visit: www.siggraph.org/conferences

Awards

ACM SIGGRAPH awards the prestigious Steven A. Coons award for lifetime achievement, the Computer Graphics Achievement Award for notable achievements, the Outstanding Service Award for extraordinary service to ACM SIGGRAPH by a volunteer, and the Significant New Researcher Award, for new contributors to our field. For a list of past award recipients, visit: www.siggraph.org/awards

Publications

ACM SIGGRAPH publications provide the world's leading forums for computer graphics research. Our conference series provides the largest source of citations in the computer graphics literature. Publications are available to ACM SIGGRAPH members for substantial discounts. See: www.siggraph.org/publications

SIGGRAPH Video Review

SIGGRAPH Video Review is the world's most widely circulated video-based publication. Over 150 programs document the annual SIGGRAPH Computer Animation Festival, providing an unequalled opportunity to study state-of-the-art computer graphics techniques, theory, and applications. New releases and recent issues available in DVD format. Visit the SIGGRAPH Review booth near the SIGGRAPH 2006 Store in the Hall B Lobby. For information, contact: svrorders@siggraph.org

SIGGRAPH 2007

You are encouraged to participate by submitting your work and volunteer application to SIGGRAPH 2007 programs: Art Gallery, Computer Animation Festival, Courses, Educators Program, Emerging Technologies, GraphicsNet, International Resources, Panels, Papers, Sketches & Posters, Special Sessions, and Student Volunteers. For complete information: www.siggraph.org/s2007

Volunteers!

All of the programs developed by ACM SIGGRAPH rely heavily on volunteer support. As a member, you are eligible to serve in some of ACM SIGGRAPH's most visible positions, including leading a professional chapter, chairing the annual conference, or serving on the ACM SIGGRAPH Executive Committee. Visit the ACM SIGGRAPH Booth or attend the ACM SIGGRAPH Get Involved session. For more information, see: www.siggraph.org/gen-info/volunteerpositions.html

Cooperative Agreements

ANZGRAPH

ANZGRAPH, the Australian and New Zealand Association for Computer Graphics, aims to provide a forum for individuals, organizations and companies that have some direct interest in the area of computer graphics. The goal is to foster the development of a computer graphics community in the Australasian region, provide a pathway to the community within our region, and facilitate participation as a member of ANZGRAPH both regionally and internationally.

www.anzgraph.org

AFRIGRAPH

AFRIGRAPH promotes computer graphics, virtual reality, and interactive techniques in Africa. It adapts these technologies to the realities of the African region, builds links between research and industry, encourages international participation of African researchers, and promotes computer graphics and interactive techniques as leading African research and application activities.

www.afrigraph.org
www.saga.za.org/

China Society of Image and Graphics (CSIG)

China Society of Image and Graphics is an academic society of scholars and engineers engaged in basic research, software and hardware development, or their applications in imaging and graphics. CSIG promotes research and development in theory and high technology, and advances popularization and applications of computer graphics.

www.jig.com.cn

Computer Graphics Arts Society (CG-ARTS)

The Computer Graphics Arts Society, officially recognized by the Japanese government in 1992, is a publicly funded body dedicated to promoting Japanese computer graphics education. It is also dedicated to developing a distinctive Japanese media arts culture in the 21st century by extending support to media-arts-related activities and artists.

www.cgarts.or.jp/

Digital Content Association of Japan (DCAj)

As digital content changes society and business, DCAj is promoting production, distribution, and use of high-quality digital content that will lead today's networked society.

www.dcaj.or.jp/

Eurographics

The European Association for Computer Graphics is a professional association that assists members with their work and careers in computer graphics and interactive digital media. Eurographics has members worldwide and maintains close links with developments in the USA, Japan, and other countries, but inviting speakers from those countries to participate in Eurographics events and by sending representatives to other events.

ACM SIGGRAPH has an affiliation agreement with Eurographics that entitles members who join both organizations to receive a discounted membership rate.

www.eg.org/

FMX/07

The 12th International Conference on Animation, Effects, Realtime and Content will be held May 1-4, 2007, in Stuttgart, Germany. FMX/07 is Europe's leading event on Animation, Visual Effects, and Games where experts exchange ideas, experiences and insights with visitors who share and understand their goals and aspirations.

www.fmx.de

Imagina

Imagina, the 25th European Digital Content Creation Festival, will be held at the Grimaldi Forum in Monte Carlo, 31 January – 2 February. Imagina focuses on the major challenges of the digital imaging industry. International experts provide insight into the state of the art and consider prospects in the main research areas of the imaging industry.

www.imagina.mc

International Game Developers Association (IGDA)

The International Game Developers Association is a non-profit association established by game developers to foster creation of a worldwide game development community. The IGDA's mission is to build a community of game developers that leverages the expertise of its members for the betterment of the industry and the development of the art form.

www.igda.org
info@igda.org

International Visual Literacy Association (IVLA)

The International Visual Literacy Association is a not-for-profit association of educators, artists, and researchers dedicated to the principles of visual literacy. It was formed for the purpose of providing education, instruction, and training in modes of visual communication and their application through the concept of visual literacy to individuals, groups, organizations, and the

general public. 2006 IVLA Annual Conference, "History, Community, & Culture: Celebrating Tradition & Transforming Our Future," will be held October 6-10 in Fort Worth, Texas.

www.ivla.org/

Laval Virtual

The 9th International Conference on Virtual Reality will be held on April 18-22, 2007, in Laval (France). Laval Virtual is where virtual reality users share their latest techniques from their fields of expertise.

www.laval-virtual.org

Nordic Interactive

Nordic Interactive focuses on initiating and stimulating research, development, and education in interactive digital technology in the Nordic countries (Denmark, Norway, Finland, Sweden). The organization facilitates collaboration among businesses, research, development, and education communities to create links among planned and existing projects, programs, and activities.

secr@nordicinteractive.org

Pacific Graphics 2006

The 14th Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2006) will be held on October 11-13, 2006 in Taipei, Taiwan. Pacific Graphics is an annual international conference on computer graphics and applications.

graphics.im.ntu.edu.tw/pg2006

SEAGRAPH

SEAGRAPH is a society headquartered in Singapore and is intended to bring together computer graphics professionals and enthusiasts in Southeast Asia, to help promote the technology in the region. The technology includes rendering techniques, graphical/geometric data compression, gaming, VR, general computer graphic techniques, and so forth.

www.seagraph.org

Swedish Computer Graphics Society (SIGRAD)

SIGRAD constitutes a meeting place for academic researchers and students, and professionals in industry with an interest in computer graphics and its applications. SIGRAD organizes an annual national conference on computer graphics as well as several workshops on various computer graphics themes.

www.sigrad.org

Call for Volunteers

ACM SIGGRAPH relies heavily on volunteers to plan and produce the premier international conference on computer graphics and interactive techniques. Volunteer opportunities for this vibrant event include: future conference chairs, SIGGRAPH 2007 sub-committee members, SIGGRAPH 2008 program chairs, and additional on-site volunteers for most years. Explore how you can contribute your ideas, energy, and expertise at:
www.siggraph.org/volunteering

Co-Located Events

The annual SIGGRAPH conference is expanding the number and breadth of co-located workshops and small conferences. Four events are co-located with SIGGRAPH 2006:

**APGV 06: Third Symposium on Applied Perception in Graphics and Visualization
28 - 30 July 2006
Sheraton Boston Hotel
Boston, Massachusetts USA**

Research in computer graphics and visualization has great potential to benefit from, and contribute to, research in perception. Since 2004, this symposium has brought together researchers from the fields of perception, graphics, and visualization to facilitate a wider exchange of ideas. Our goals are to use insights from perception to advance the design of methods for visual, auditory, and haptic representation, and to use computer graphics to enable perceptual research that would otherwise not be possible.

For more information and registration:
<http://www.apgv.org/>

**International Workshop on Volume Graphics
30 - 31 July 2006
Boston Park Plaza Hotel
Boston, Massachusetts USA**

Following successful workshops in Swansea (1999), Stony Brook (2001), Tokyo (2003), and Stony Brook again (2005), the 5th International Workshop on Volume Graphics, VG06, will take place in Boston in July 2006. VG06 brings together academic and industry researchers who are working, or wish to work, on volume graphics (modeling, processing, and rendering data that are typically acquired through analytical methods, medical scanners, computational simulations, or statistical measurements). Volume graphics is capable of modeling solid as well as amorphous objects, and interiors as well as surfaces, and it synthesizes graphical images in a true 3D manner. The workshop will continue to explore the potential of volume-based techniques beyond the scope of volume visualization as it is currently practiced.

For more information and registration:
<http://vg.swan.ac.uk/vg06/>

**Sandbox: An ACM Video Game Symposium
29 - 30 July 2006
Boston Marriott Copley Place
Boston, Massachusetts USA**

The Sandbox symposium includes keynotes, panels, papers, and, a Hot Games session that previews unreleased titles from major game companies and independent developers.

Video games are a singular technological medium, comparable in cultural impact to the telephone, television, or the internet. How can we advance the state of technology while ensuring that the medium flourishes? What role do independent developers play in maintaining diversity and creativity in this medium? How do video games affect societies and individuals?

For more information and registration:
<http://sandboxsymposium.org/>

**Symposium on Point-Based Graphics 2006
29 - 30 July 2006
Boston Park Plaza Hotel
Boston, Massachusetts USA**

The IEEE/Eurographics Symposium on Point-Based Graphics (PBG) is a forum for presenting new results related to the use of point-based primitives in modeling, rendering, data acquisition, simulation, geometry, and graphics hardware. Building on the successful PBG 2004 in Zürich and PBG 2005 in Stony Brook, the next symposium is co-located with SIGGRAPH 2006 in Boston.

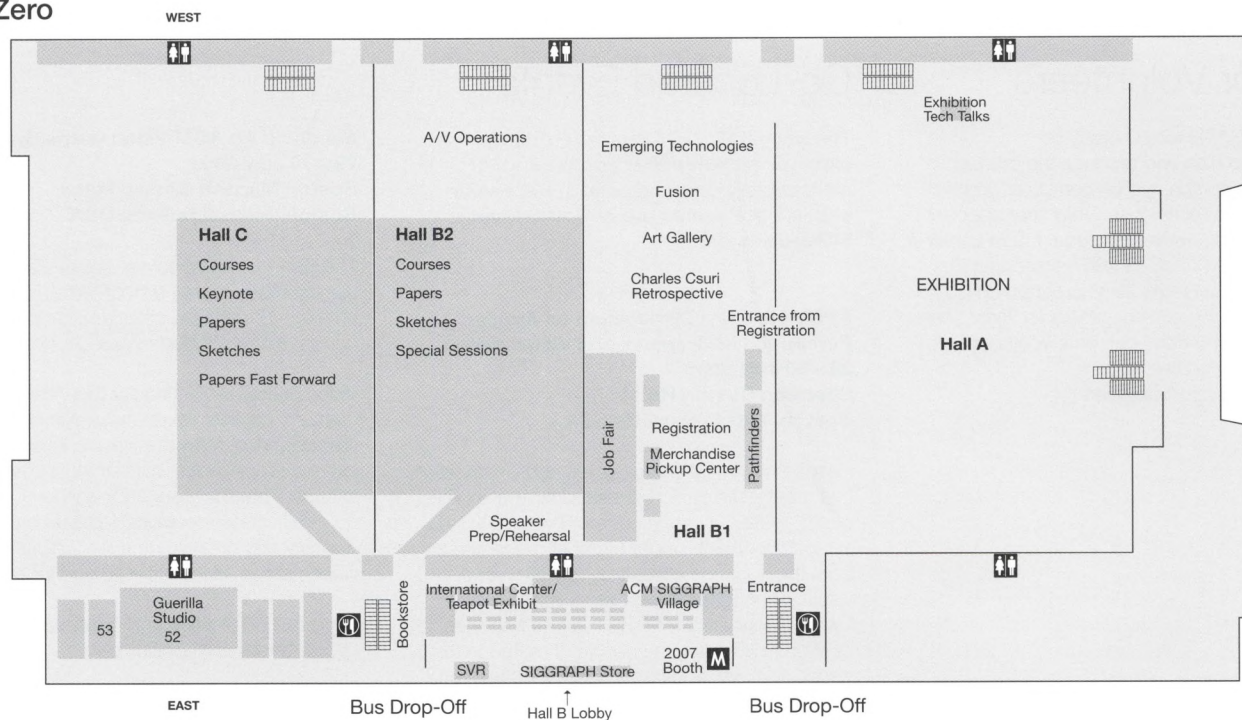
For more information and registration:
<http://graphics.ethz.ch/PBG06/>

Inquiries about co-locating events with the annual SIGGRAPH conference should be directed to:

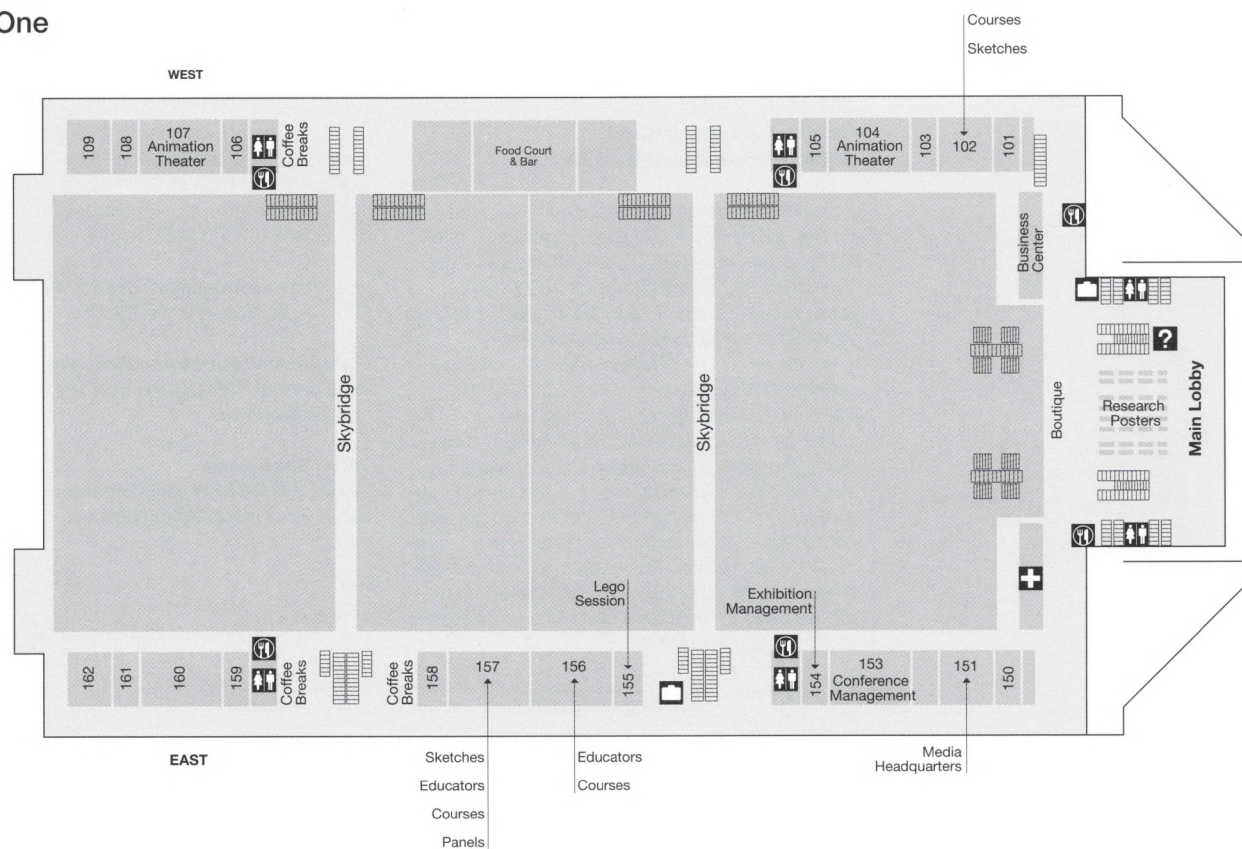
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ACM SIGGRAPH Vice President
alyn_rockwood@siggraph.org**

Boston Convention & Exhibition Center

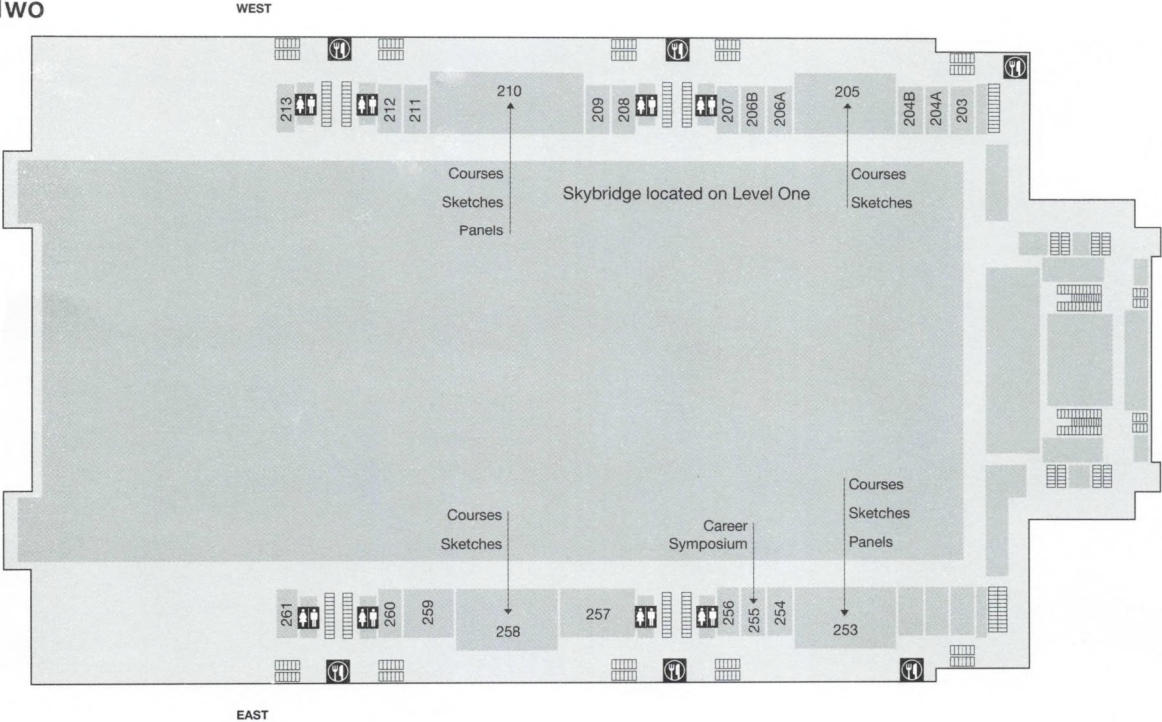
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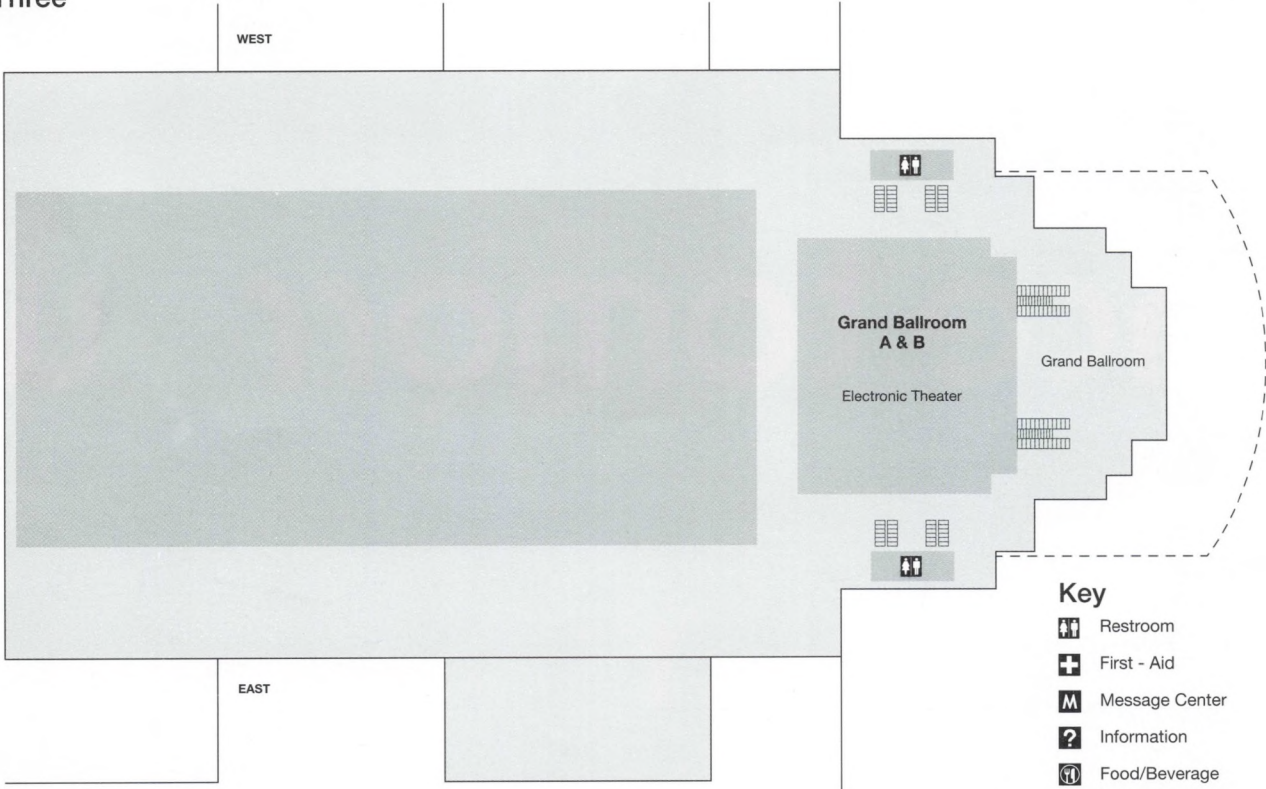
Level One



Level Two



Level Three



- Key**
- Restroom
 - First - Aid
 - Message Center
 - Information
 - Food/Beverage
 - Baggage Check

A large, stylized, blue-toned graphic of a face, composed of geometric shapes and patterns, set against a dark blue background with faint star-like speckles. The face has a futuristic, almost robotic appearance with various lines and shapes defining its features.

face tomorrow

SIGGRAPH2007

The 34th International Conference and Exhibition on Computer Graphics and Interactive Techniques

Conference 5-9 August 2007 Exhibition 7-9 August 2007 San Diego Convention Center San Diego, California USA www.siggraph.org/s2007



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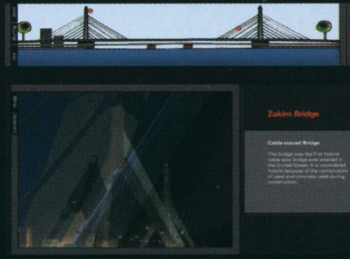
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Manager, Create Boston, a program of the Boston Redevelopment Authority, Boston's Planning, Economic Development, and Workforce Development Agency. (www.createboston.com)

Future Conference Dates

SIGGRAPH 2007

5 - 9 August 2007

San Diego, California USA

SIGGRAPH 2008

11 - 15 August 2008

Los Angeles, California USA

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