

Program & Buyer's Guide

28th International Conference on Computer Graphics

28th International Conference on Computer Graphics and Interactive Techniques

and Interactive Techniques

CONFERENCE 12-17 AUGUST 2001 EXHIBITION 14-16 AUGUST 2001

Los Angeles, California USA

Los Angeles Convention Center

SIGGRAPH

2001

EXPERIENCE INTERACTION
AND DIGITAL IMAGES

ACM
1515 Broadway
New York, New York
10036 USA

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Program & Buyer's Guide
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Contents

2	Conference at a Glance	125	Attendee Services	129	Exhibition
3	Welcome		Airport Shuttle Desk	130	Exhibition Floor Plan
4	Conference		Audio/Visual Services	132	Exhibitors
	Technical Program		Automated Teller Machines (ATMs)	172	Product Index
	Conference Programs & Activities		Banks/Currency Exchange	185	Advertiser Index
	Special Sessions		Beaming Stations	186	ACM SIGGRAPH Organization
8	Exhibitor Forums		Bookstore	188	Committees
10	Areas of Interest		Child Care	189	Acknowledgements
12	Creative Applications Lab		Conference Management Office	190	SIGGRAPH 2002
14	Pathfinders		Electronic Theater Tickets	192	Convention Center Map
15	Courses		Exhibition Management Office		
43	Course Organizers		Exhibitor Registration		
45	Papers & Panels		First Aid Offices		
56	Paper Contacts/Panel Organizers		Food Services		
59	Sketches & Applications		Housing/Airline Desk		
80	Educators Program		Information Desks		
86	Art Gallery: N-Space		International Resources		
95	Computer Animation Festival		Internet Access Centers		
	2001: A Digital Odyssey		Los Angeles Convention Center		
	Animation Theater		Accessibility		
	Multiplex Showtimes		Business Center		
103	Emerging Technologies		Parking		
107	The Studio		Lost and Found/Security		
115	Student Volunteers		Luggage/Coat Checks		
116	SIGGRAPH TV		Merchandise Pickup Center		
116	SIGGRAPH Online		Message Center		
117	GraphicsNet		Registration (Advance & On-site)		
118	International Resources		Restaurant Information Desks		
120	Career Services		Shipping Desk		
121	Birds of a Feather		Shuttle Service		
122	Hotels/Maps of Los Angeles		SIGGRAPH Store		
124	Registration and Media Information		Speaker Prep Room		
			Special Assistance Desk		
			Special Policies		
			Technical Materials Sold After the Conference		
			Technical Session Lounge		
			Ticket Purchase and Exchange Counter		
			Reception Tickets		
			Telephone Numbers		

Conference at a Glance

Conference Registration Categories

■ Full Conference ● Conference Select ▲ Exhibits Plus

AUGUST	S 11	S 12	M 13	T 14	W 15	T 16	F 17
Registration	6 - 8 pm	9 am - 7 pm	8 am - 5 pm	8 am - 5 pm	8 am - 5 pm	8 am - 5 pm	8 - 11 am
Merchandise <i>Pickup</i>	6 - 8 pm	9 am - 7 pm	8 am - 5 pm	8 am - 5 pm	8 am - 5 pm	8 am - 5 pm	8 - 11 am
Merchandise <i>Store</i>	6 - 8 pm	9 am - 7 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 3 pm
▲ ● ■ Exhibition/Startup Park				10 am - 6 pm	10 am - 6 pm	10 am - 5 pm	

TECHNICAL PROGRAM

■ Courses		10 am - 5 pm	8:30 am - 5 pm	8:30 am - 5 pm	10 am - 6 pm		
■ Papers					10:30 am - 6 pm	8:30 am - 6 pm	8:30 am - 6 pm
■ Panels					10:30 am - 6 pm	8:30 am - 6 pm	8:30 am - 4 pm
● ■ Sketches & Applications					10:30 am - 6 pm	8:30 am - 6 pm	8:30 am - 4 pm
● ■ Educators Program		5 - 7 pm	8:30 - 10 am	8:30 - 10 am	10:30 am - 5 pm	8:30 am - 6 pm	8:30 am - 4 pm

CONFERENCE PROGRAMS & ACTIVITIES

▲ ● ■ Art Gallery: N-Space		4 - 7 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 1 pm
▲ ● ■ Birds of a Feather	Throughout the Week						
▲ ● ■ Career Center		2 - 7 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 3 pm
Computer Animation Festival							
■ Electronic Theater			7 - 9 pm	7 - 9 pm	7 - 9 pm	7 - 9 pm	
● ■ Electronic Theater Matinée				2 - 4 pm	2 - 4 pm		
▲ ● ■ Animation Theaters		3 - 7 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 3 pm
● ■ Creative Applications Lab		noon - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm
▲ ● ■ Emerging Technologies		4 - 7 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 3 pm
▲ ● ■ Exhibitor Forums				10 am - 6 pm	10 am - 6 pm	10 am - 3 pm	
▲ ● ■ Fundamentals Seminar		2 - 5 pm					
▲ ● ■ Get Involved					5 - 6:30 pm		
▲ ● ■ International Resources	6 - 8 pm	9 am - 7 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 5 pm
▲ ● ■ Internet Access Centers		9 am - 7 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 5:30 pm
▲ ● ■ Job Fair					8 am - 5 pm		
▲ ● ■ Keynote Address/Awards					8 - 9:45 am		
▲ ● ■ Pathfinders	4 - 8 pm	9 am - 7 pm	8 am - 6 pm	8 am - 6 pm	8 am - 5 pm	8 am - 5 pm	
▲ ● ■ SIGGRAPH TV		11 am - 7 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 3 pm
Special Sessions							
▲ ● ■ Virtual Stars			6:30 - 8:30 pm				
● ■ Masters of the Game					12:30 - 2 pm		
▲ ● ■ Web3D RoundUP					7:30 - 9 pm		
▲ ● ■ Sensapoolooza						6 - 8 pm	
● ■ 2001 in 2001							12:30 - 2 pm
● ■ The Studio		1 - 7 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm
▲ ● ■ ACM SIGGRAPH Forum						12:15 - 1:30 pm	

RECEPTIONS

■ Courses Reception			8 - 11 pm				
■ Papers/Panels Reception						8 - 11 pm	

Welcome to Los Angeles and Your Conference!

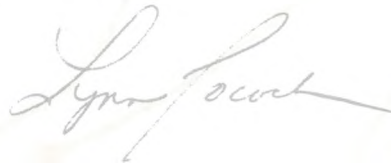
Over the past 19 months, the SIGGRAPH 2001 Committee has evaluated, planned, requested, selected, and produced.

Now we're presenting: the world's 28th annual conference on computer graphics and interactive techniques. We hope that it meets and exceeds your expectations in every way.

During this amazing week in the Los Angeles Convention Center, the Shrine Auditorium, and other LA locations, you will hear, meet, see, and experience your community's adventurous authors, thought-provoking speakers, awesome animations, exceptional exhibits of technologies and tools, collaborative breakthroughs, and several very surprising applications.

Happy exploring!

SIGGRAPH 2001 Conference Chair
LYNN POCOCK

A handwritten signature in dark ink, appearing to read "Lynn Pockock", written in a cursive, flowing style.

Conference



Keynote Address/Awards West Hall A

Wednesday, 15 August, 8 - 9:45 am

Danny Hillis, chairman and chief technology officer of Applied Minds, Inc. and co-chairman of The Long Now Foundation, presents the SIGGRAPH 2001 keynote address:

The Big Picture

As technological change continues to deliver new marvels and new possibilities, it is easy to lose track of the larger perspective. Technological progress, in particular the evolution of computer graphics, can best be understood as part of the bigger story of the evolution of human intelligence and its relationship to the natural world.

Immediately before the keynote address, ACM SIGGRAPH presents the Significant New Researcher Award to Paul E. Debevec, USC Institute for Creative Technologies; Computer Graphics Achievement Award to Andrew Witkin, Pixar Animation Studios; and the 2001 Steven Anson Coons Award for Outstanding Creative Contributions to Computer Graphics to Lance J. Williams, Walt Disney Feature Animation.

TECHNICAL PROGRAM



Courses

SIGGRAPH 2001 Courses provide in-depth instruction on a variety of topics. Courses range from introductory and refresher topics to cutting-edge technologies that combine computer graphics with other aspects of computing. See page 15 for a complete list of Courses.



Papers

West Hall A and Petree Hall C & D

SIGGRAPH 2001 presents technical Papers on the latest advances in computer graphics, computer animation, computer games, geometric modeling, graphics hardware, imaging, haptics, audio, biology, visualization, and related topics. For a complete list of Papers, see page 45.



Panels

West Hall B and Petree Hall C & D

Activists, theorists, artists, engineers, and executives explore the burning issues that are defining computer graphics and interactive techniques today and tomorrow. After their presentations, panelists confront questions from the audience. For a complete list of Panels, see page 45.



Sketches & Applications

Rooms 403, 404, 406, 408, and West Hall A

Short, informal presentations on advanced research, artistic adventures, next year's technologies, production breakthroughs, and non-idle speculation. Presenters preview the latest in concept, design, and implementation in architecture, scientific visualization, fine and performing arts, and entertainment. For a complete list of Sketches & Applications, see page 59.



Educators Program

Rooms 502B, 503, 504, 505, CAL

Rethink what "education" is. Join researchers, practitioners, and educators to exchange ideas on innovative and creative uses of computer graphics for learning. Experience a forum where the edge between learning and doing disappears. For a complete list of the Educators Program, see page 80.

Areas of Interest



Animation & Special Effects



Art



Game Development &
Interactive Techniques



Virtual Reality



Web-related

CONFERENCE PROGRAMS & ACTIVITIES



Art Gallery: N-Space

Concourse Foyer, Room 153A/B, Room 405

Experience a world-renowned exhibition of digitally based and inspired artwork. Via N-Space, viewers travel to places where ideas and expression are rich, and artistic freedom is unconstrained by dimension. The art embodies thoughts that go beyond labels into an unlimited digital frontier, beyond the medium to a place where it acts as a conduit for the message. For a complete list of Art Gallery pieces, see page 86.



Birds of a Feather

Attendee-organized sessions on shared interests, goals, technologies, environments, or backgrounds. For a current listing, see page 121. At SIGGRAPH 2001, impromptu gatherings can be organized through the Birds of a Feather schedule board in the South Lobby.

Conference Registration Categories

■ Full Conference ● Conference Select ▲ Exhibits Plus

For information on what is included with each registration category, see page 124.

CONFERENCE PROGRAMS & ACTIVITIES

■ ● ▲

Career Center Kentia Hall

The annual world-class employment event for the international computer graphics industry. Job seekers post résumés and consult with career mentors. Employers post job openings and schedule interviews. See page 120.

Computer Animation Festival 2001: A Digital Odyssey

■ ● ▲

Animation Theaters Rooms 409AB, 411 and 501AB

■ ●

Electronic Theater Shrine Auditorium

The world's most prestigious film and video extravaganza, showcasing dazzling and innovative imagery in invited and submitted works selected by a distinguished jury of computer graphics experts and specialists. Selections are presented in a multiplex format of daily screenings in three Animation Theaters, and in the Electronic Theater matinee and evening shows at the Shrine Auditorium. See page 95.

■ ●

Creative Applications Lab West Hall A

Join SIGGRAPH 2001 speakers and presenters for informal follow-up sessions and a series of invited hands-on talks. Share critiques and suggestions with other attendees. Enhance your skills and insights. Post-session CAL activities are available for many Courses, Papers, Panels, Sketches & Applications, and Educators Program presentations. Artists and animators also use the CAL to explain and discuss their work. See page 12.

■ ● ▲

ACM SIGGRAPH Forum

South Lobby - ACM SIGGRAPH Membership Booth
Thursday, 16 August, 12:15 - 1:30 pm

■ ● ▲

Emerging Technologies Concourse Hall 150, 151, 152

Emerging Technologies features the latest developing technologies that enable and promote play: design and interactivity, robotics and display systems, prototypes and collaborative endeavors in innovative applications of new technologies, and adventurous speculation. See page 103.

■ ● ▲

Exhibition South Hall

The latest hardware, software, systems, and services from the world's premier suppliers of computer graphics and interactive techniques. In Startup Park, first-time exhibitors display the next generation of interactive graphics. See page 129.

■ ● ▲

Exhibitor Forums South Hall

In seminars and demos, companies present essential information on new technologies and how to use them. See page 8.

■ ● ▲

International Resources West Lobby

The multi-lingual SIGGRAPH 2001 International Committee delivers information, guidance, and translation services from its headquarters in the International Center. See page 118.

■ ● ▲

Job Fair Kentia Hall

Nine hours of non-stop opportunity. Employers and attendees compare requirements and experience, review demo reels, and negotiate career options. See page 120.

■ ● ▲

Pathfinders South Lobby

Personal guidance to the full range of possibilities at SIGGRAPH 2001. If you need information, consultation, or expert recommendations, talk with a veteran SIGGRAPH mentor at Pathfinders. See page 14.

■

Receptions

Greet and meet old friends, new acquaintances, and future collaborators at informal evenings of fun, food, and entertainment in some of Los Angeles' coolest locations.

Courses Reception

Monday, 13 August, 8 - 11 pm
Pershing Square
Olive and 6th Street

Papers/Panels Reception

Thursday, 16 August, 8 - 11 pm
Universal Studios
100 Universal City Plaza
Universal City

■ ● ▲

SIGGRAPH TV

Informative, insightful HDTV summaries of SIGGRAPH 2001 delivered to high-resolution plasma displays in monoliths distributed throughout the Los Angeles Convention Center. See page 116.

■ ●

The Studio West Hall A

Where SIGGRAPH 2001 attendees collaborate with advanced digital systems and each other to generate 2D and 3D creations. Throughout SIGGRAPH 2001, The Studio hosts tutorial sessions in the Interactive Classroom. See page 107.

Annually at the conference, ACM SIGGRAPH holds a forum to respond to members' concerns, provide information for people who may be interested in volunteering to help the community, answer questions, and report on its year-round projects and accomplishments. All SIGGRAPH 2001 attendees are invited.

CONFERENCE PROGRAMS & ACTIVITIES

Special Sessions



Virtual Stars

Monday, 13 August, 6:30 - 8:30 pm



West Hall B

Visual Effects Supervisors at Sony Pictures Imageworks and Rhythm & Hues discuss creation of photo-realistic digital characters for leading roles in films. This session provides a rare look at the evolving technical and artistic capability that has dramatically expanded filmmakers' boundaries: the creation of digital characters with dynamic personalities and an unparalleled level of realism, seamlessly integrated into a live-action environment. Individual presentations will be followed by a roundtable discussion.

Moderator

KEN RALSTON
Sony Pictures Imageworks Inc.

Panelists

JEROME CHEN
Sony Pictures Imageworks Inc.

JOHN DYKSTRA
Columbia Pictures

BILL KROYER

BILL WESTENHOFFER
Rhythm & Hues

ROB LEGATO
Warner Bros.



Masters of the Game

Wednesday, 15 August, 12:30 - 2 pm



West Hall B

Winners of Academy of Interactive Arts and Sciences Interactive Achievement Awards offer a behind-the-scenes look at some of the world's leading games and the people who created them. The award winners speak about the games, their sources of inspiration, their multi-disciplinary teams, and how they created the magic that earned them awards for excellence in art direction, animation, game-play engineering, visual engineering, sound design, musical composition, and character and story development.

Host

J.C. HERZ
Joystick Nation Inc.

- Outstanding Achievement in Sound Design and Musical Composition Medal of Honor

Underground (PlayStation)

DreamWorks Interactive/Electronic Arts

ERIK KRABER

JACK GRILLO

DreamWorks Interactive

- Outstanding Achievement in Visual Engineering and Game-Play Engineering

SSX: Snowboarding Super Cross (PlayStation 2)

Electronic Arts/Electronic Arts

MIKE RAYNER

Electronic Arts

- Outstanding Achievement in Game Design

Zelda Majora's Mask (Nintendo 64)

Nintendo Co. Ltd./Nintendo of America

KEN LOBB

Nintendo of America Inc.

- Outstanding Achievement in Character or Story Development

Baldur's Gate II (PC)

Interplay Entertainment

BioWare Corp.

DAVID HIBBELN

BioWare Corp.



Web3D RoundUP

Wednesday, 15 August, 7:30 - 9 pm



West Hall B

The interactive event for interactive content. Web3D content developers and toolmakers demonstrate the latest technology and applications in a fast-paced shootout. The audience selects the best of the best from over 25 pre-selected presenters.

Organizer

TIMOTHY CHILDS
RoundUP Productions and Eyematic



Sensapoolooza: Guided Tour of the New Silicon Senses

Thursday, 16 August, 6 - 8 pm

g/it vr w

West Hall B

Sensory explorers describe a future where computing strategies and digital devices enhance, heighten, and repair the human sensorium. This special session is a combination of talk show and television cooking program, with a Greek chorus attached. Six guests (one for each of the five senses and one for the sixth sense, mind) demonstrate leading-edge technologies that show how the human sensorium is being augmented with sophisticated computer chips. During and after the demos, members of the Greek chorus contribute their own observations and comments.

Organizers

KATHRYN SAUNDERS
ThinkTech

JAMES GEARY
TIMEurope.com

Host

JAMES GEARY
TIMEurope.com

Participants

FERDINANDO (SANDRO) MUSSA-IVALDI
Northwestern University

HENRI LUSTIGER-THALER
Aerome USA

THOMAS A. FURNESS III
University of Washington

HIROSHI ISHII
Massachusetts Institute of Technology

ELLWOOD IVEY
Trisenx, Inc.

ALEX WAIBEL
Carnegie Mellon University

Commentators

ANDREW GLASSNER
Writer and Consultant

MONIKA FLEISCHMANN
GMD-Forschungszentrum Informationstechnik GmbH

ROSALIND W. PICARD
Massachusetts Institute of Technology



2001 in 2001: How a Film Inspired Our Future

Friday, 17 August, 12:30 - 2 pm

sfx

West Hall B

In 1968, Stanley Kubrick created a motion picture that did much more than tell a story. "2001" defined the future and our place in it, inspired a generation of artists and filmmakers, and created a new perspective of the world. In this very special session, industry veterans, historians, and visionaries explore Kubrick's "2001: A Space Odyssey" and how its influence will extend far into the 21st century.

Moderator

JACQUELYN FORD MORIE
USC Institute for Creative Technologies

Panelists

ROBERT ABEL
Robert Abel and Associates

PETER HYAMS
Peter Hyams Productions

SYD MEAD
Syd Mead Incorporated

DENNIS MUREN
Industrial Light + Magic

Areas of Interest

sfx Animation & Special Effects

a Art

g/it Game Development &
Interactive Techniques

vr Virtual Reality

w Web-related

Exhibitor Forums

In Exhibitor Forums, SIGGRAPH 2001 exhibitors go beyond short demos of their products and services to present two-hour tutorials, panel discussions, or hands-on instruction.

All Exhibitor Forums are presented in a theater-style setting on the exhibition floor.

10 am - noon

IGDA and Game Developer Magazine Gaming Nation

Game industry veterans and visionaries survey the state of the industry. The International Game Developers Association, in conjunction with Game Developer Magazine, hosts this lively panel discussion. Game developers are especially encouraged to attend and provide their input.

JASON DELLA ROCCA
International Game Developers Association
600 Harrison Street
San Francisco, California 94107 USA
+1.415.947.6235
+1.415.947.6090 fax
info@igda.org

1 - 3 pm

Screamline Rendering Services The Changing Face of Rendering

Learn how computer graphics rendering is changing for the better, today and tomorrow. Discover how outsourced rendering service solutions may be the answer you are looking for, in control, cost, and timing. In this session, leading industry animators from Kleiser-Walczak, Xulu Entertainment, and Wild Brain, Inc., share real-world experiences with the latest rendering resources and explain how they remain focused on what matters most: hot digital content!

KELLEY OLIVER
Screamline Rendering Services
5193 Northeast Elam Yount Parkway
Hillsboro, Oregon 97124 USA
kelley.b.oliver@intel.com

4 - 6 pm

Discreet Making the Most of 2D and 3D Integration

Discreet presents methods and techniques for optimizing 2D-3D integration. This session reviews new compositing techniques using 3D data, new "single-pass" rendering, and advanced paint and animation using combustion and 3ds max.

SYLVA BATMANIAN
Discreet
10 Duke Street
Montreal, Quebec H3C 2L7 CANADA
sylva.batmanian@discreet.com

10 am - noon

Raindrop Geomagic, Inc.**Geomagic Studio: Powering 3D Photography**

Communicate, differentiate, and customize with Geomagic Studio and 3D photography. Raindrop Geomagic application experts demonstrate how Geomagic Studio 4.0 automates the 3D photography process: taking output from 3D cameras; capturing the color, texture, and shape of real-world objects; and transforming them into usable models for diverse applications.

NICO CHENG

Raindrop Geomagic, Inc.
617 Davis Drive, Suite 300
Durham, North Carolina 27713 USA
nico@geomagic.com

1 - 3 pm

Visviva Software, Inc.**Interactive Media Production**

How to create an interactive, animated multimedia project within two hours with Visviva Authoring Studio (VAS). VAS completely integrates distinct elements such as object design, animation composition, 3D modeling, image painting, vector drawing, and hypertext editing to create a unified, object-oriented development environment.

YUTING TU

Visviva Software, Inc.
2200 Ogden Avenue, Suite 350
Lisle, Illinois 60532 USA
tu@visviva.com

4 - 6 pm

Toon Boom Technologies, Inc.**Productivity, Efficiency, and Creativity: Discover USAnimation, the Second Animation Software Solution**

This session highlights the features and benefits of Toon Boom Technologies' new release of USAnimation V5.3, and its high-performance Toonshader and Color Vectorization stand-alone modules. USAnimation V5.3's new features include support of Linux and Windows 2000, a camera effect plug-in to create anamorphic effects, XsheetTemplates, and FlashRender improvements. Understand how to take a 3D model created with Maya and convert it to 2D for use in USAnimation. With the new color-vectorization feature, you can import toonshaded animation created with software other than Maya.

KARINA BESSOU DO

Toon Boom Technologies, Inc.
7 Laurier East
Montreal, Quebec H2T 1E4 CANADA
karina@toonboom.com

10 am - noon

Vancouver Film School**Careers in 3D Animation**

Interested in a career in 3D animation? This session includes a screening of outstanding student work, a comprehensive overview of the Vancouver Film School's 3D animation programs and admissions requirements, discussion of career opportunities, and a question-and-answer period.

JANET CACCHIONO

Vancouver Film School
200-198 West Hastings Street
Vancouver, British Columbia V6B 1H2
CANADA
registrar@vfs.com

1 - 3 pm

3D-Online**Converting Your 3D Models and Scenes to Interactive Web 3D**

How 3D modelers can add interactivity to their 3D scenes and publish their content to the Web, simply by naming objects in their scene. Users can then navigate to pre-defined viewpoints, turn lights on and off, open and close doors and windows, control colors and textures, and stop and start animations. Software that enables this interactivity is available during the presentation and at the 3D-Online booth.

MITCH WILLIAMS

3D-Online
820 Manhattan Avenue, #104
Manhattan Beach, California 90266 USA
mwilliams@3D-Online.com

Areas of Interest

SIGGRAPH 2001 programs capture five broad areas of interest.

Areas of Interest

sfx

Animation & Special Effects

Producing and using computer graphics techniques for animation, special effects, and other entertainment applications.

Courses

- 2 Obtaining 3D Models With a Hand-Held Camera
- 5 Visualizing Quaternions
- 6 Object Space Visibility
- 10 State of the Art in Modeling and Measuring of Surface Reflection
- 13 Interactive Ray-Tracing
- 17 Geometric Signal Processing on Large Polygonal Meshes
- 19 "Shrek": The Story Behind the Screen
- 20 Advanced Global Illumination
- 21 Seeing is Believing: Reality Perception in Modeling, Rendering, and Animation
- 23 Motion Dynamics Animation Workshop
- 24 Real-Time Shading
- 25 Physically Based Modeling
- 29 State of the Art in Monte Carlo Ray Tracing for Realistic Image Synthesis
- 32 Nonphotorealistic Rendering in Scientific Visualization
- 33 New Directions in Shape Representations
- 38 A Practical Guide to Global Illumination Using Photon Mapping
- 40 Practical Parallel Processing for Today's Rendering Challenges
- 42 Seeing in 3D
- 45 Advanced Issues in Level of Detail
- 47 Simulating Nature: Realistic and Interactive Techniques
- 48 Advanced RenderMan 3
- 49 Image Processing for Volume Graphics
- 51 Making Motion Capture Useful

a

Art

New technologies and techniques for art and examples of artistic expression using computer graphics.

- 4 A Survey of Color for Computer Graphics
- 32 Nonphotorealistic Rendering in Scientific Visualization
- 35 The Technology and Practice of Digital Cinema (D-Cinema)
- 36 From Ivory Tower to Silver Screen: Visual Effects Companies Reveal How Research and Development Finds its Way Into Production
- 42 Seeing in 3D
- 47 Simulating Nature: Realistic and Interactive Techniques

g/it

Game Development & Interactive Techniques

Design, implementation, and application of game development and intuitive human-computer communication.

- 2 Obtaining 3D Models With a Hand-Held Camera
- 3 Performance OpenGL: Platform-Independent Techniques
- 9 Media-Rich Programming With OpenGL
- 11 Tracking: Beyond 15 Minutes of Thought
- 12 Developing Efficient Graphics Software
- 16 Gaming Techniques for Designing Compelling Virtual Worlds
- 24 Real-Time Shading
- 27 Augmented-Reality: The Interface is Everywhere
- 30 Visibility: Problems, Techniques, and Applications
- 44 Advanced Topics in 3D User Interface Design
- 45 Advanced Issues in Level of Detail
- 50 Digital Geometry Processing
- 52 DirectX 8 Graphics
- 54 An Interactive Introduction to OpenGL Programming

vr

Virtual Reality

Creation of and immersive interaction with virtual environments.

- 12 Developing Efficient Graphics Software
- 15 Visualizing Relativity
- 27 Augmented-Reality: The Interface is Everywhere
- 30 Visibility: Problems, Techniques, and Applications
- 31 Computer Graphics for Large-Scale Immersive Theaters
- 39 3D Hardcopy: Converting Virtual Reality to Physical Models
- 43 Aggressive Performance Optimizations for 3D Graphics
- 44 Advanced Topics in 3D User Interface Design

w

Web-related

Technologies for designing and delivering content over the Web.

- 1 The Impact of Public Policy on Computer Graphics
- 9 Media-Rich Programming With OpenGL
- 22 Intro to SMIL
- 26 Internetworked 3D Computer Graphics: Overcoming Bottlenecks, Supporting Collaboration, and Stepping up to Wireless Connectivity
- 34 User-Interface Design for Work, Home, and on the Way
- 50 Digital Geometry Processing

In this publication, symbols identify which Courses, Panels, Sketches & Applications and Educators Program sessions are associated with these areas of interest. Other programs also include area of interest content.

Panels

- The Future of Color: Creativity and Technology
- Newton's Nightmare: Reality Meets Faux Physics
- Non-Linear Animation for Production
- Size Matters: Digital Cinema Distribution
- Special Session: 2001 in 2001: How a Film Inspired Our Future
- Special Session: Virtual Stars
- Traditional Skills, New Tools
- Video Gameplay and Design: Procedural Directions
- VIPs: Virtually Invented People

Sketches & Applications

- Animation Techniques
- Death and Destruction
- Feature FX
- Fun for TDs
- Fuzzy Creatures
- The Magic Behind the Magic: "Pearl Harbor" (single session)
- Merging 2D and 3D Production Methods
- On-Set CG
- Production Overviews
- "Summer Breeze:" Creating a High-End 3D Moving Using Limited Resources (single session)

Educators Program

- Hands-On Classical Animation Workshop
- The Process Behind "Rupert," a Student-Produced 3D Animation
- Résumés and Demo Reels: If Yours Aren't Working, Neither Are You!
- Studio Views on Demo Tapes
- Teaching Computer Animation for Results!

- Art in Space: What For?
- The CAVE and Beyond: VR Art in Museums and Galleries
- The Future of Color: Creativity and Technology
- Cultural Mediation in New Media Spaces
- Game-Stories: Simulation, Narrative, Addiction
- Traditional Skills, New Tools
- Visualization, Semantics, and Aesthetics

- genieBottles: An Interactive Narrative in Bottles (single session)
- Interactive Art
- A Multipurpose Array of Tactile Rods for Interactive eXpression (single session)
- Open Processes Create Open Products: "Interface Ecology" as a Metadisciplinary Base for CollageMachine (single session)
- Sketching Space: Virtual to Real (single session)

- Designing Experience: Modeling On-Line Collaborative Learning in Art & Design
- Life Drawing and 3D Figure Modeling with Maya
- Seeing Drawing
- The Teaching of Computer Graphics in an Art & Design Curriculum

- :-o A Conversation About Interactive Entertainment Experiences on Instant Messaging Devices
- Computer Games and Viz: If You Can't Beat Them, Join Them
- Cultural Mediation in New Media Spaces
- Designing, Understanding, and Operating Complex Human-Machine Systems
- Game-Stories: Simulation, Narrative, Addiction
- Special Session: Sensapoloosa: Guided Tour of the New Silicon Senses
- Special Session: Masters of the Game
- Video Gameplay and Design: Procedural Directions

- Interaction Mechanisms
- Mayhem: A New Trend for Virtual Environments (and Online Games) (single session)

- Curricular Modules: 3D and Immersive Visualization Tools for Learning
- Designing and Developing interactive Entertainment at Bell h@bitat, Canadian Film Centre
- Games and Education
- Speeder Reader: An Experiment in the Future of Reading

- The CAVE and Beyond: VR Art in Museums and Galleries
- Computer Games and Viz: If You Can't Beat Them, Join Them
- Cultural Mediation in New Media Spaces
- Designing, Understanding, and Operating Complex Human-Machine Systems
- Immersed in Anxiety or a Process to Healing? VR Meets Mental Health
- Special Session: Sensapoloosa: Guided Tour of the New Silicon Senses
- Visualization, Semantics, and Aesthetics

- Enhanced Reality: A New Frontier for Computer Entertainment (single session)
- Life-Sized Projector-Based Dioramas: Spatially Real and Visually Virtual (single session)
- Manipulate the Unreachable: Through-the-Lens Remote Object Manipulation in Virtual Environments (single session)
- Simulation Fidelity Metrics for Virtual Environments Based on Memory Semantics (single session)
- Sketching Space: Virtual to Real (single session)
- Solving a 3D Cube Puzzle in a Collaborative Virtual Environment: As Good as Really Being There Together? (single session)
- Virtual Landscapes

- CyberMath: Exploring Open Issues in VR-Based Education

- :-o A Conversation About Interactive Entertainment Experiences on Instant Messaging Devices
- Beyond Copyright: The Brave New World of Digital Rights Management
- The CAVE and Beyond: VR Art in Museums and Galleries
- Cultural Mediation in New Media Spaces
- Game-Stories: Simulation, Narrative, Addiction
- Internet Appliances: New Horizons for the Web
- Special Session: Sensapoloosa: Guided Tour of the New Silicon Senses
- Special Session: Web3D RoundUP
- VIPs: Virtually Invented People
- Visualization, Semantics, and Aesthetics

- CONTRIGA: A High-Level XML-Based Declarative Approach to Interactive 3D Components (single session)
- X3D Content Examples, Editing, Conformance Suite, and Software Development Kit (SDK) CDs

- Designing Experience: Modeling On-Line Collaborative Learning in Art & Design
- Graphics in a Flash: An Introduction to Vector-Based Web Graphics
- Internet Studios: Teaching Architectural Design Online in the United States and Latin America
- Internet2 Applications and Infrastructure
- The Promise of the Web for Learning
- Webtanks: Tools for Learning by Design

Creative Applications Lab

Share critiques and suggestions with other attendees. Enhance your skills and insights. Post-session CAL activities are available for many Courses, Papers, Panels, Sketches & Applications, and Educators Program presentations. Artists and animators also use the CAL to explain and discuss their work.

When the Creative Applications Lab is scheduled for specific technical sessions, it may not be available for use by other attendees.

Throughout the Program & Buyer's Guide, this symbol designates presentations that include CAL activities: 

Check signage in the Creative Applications Lab for a current list of activities and times.

Chair
STUART ANDERSON
Metro Link Incorporated

Location

West Hall A

Days & Hours

Sunday, 12 August
noon - 6 pm
Monday, 13 August
9 am - 6 pm
Tuesday, 14 August
9 am - 6 pm
Wednesday, 15 August
9 am - 6 pm
Thursday, 16 August
9 am - 6 pm
Friday, 17 August
9 am - 6 pm

Note: Some Courses held in the Creative Applications Lab may have an 8:30 am starting time.

Committee

TONY BAYLIS
SIGGRAPH 2002 Creative Applications Lab Chair
National Center for Supercomputing

ROBIN CUTSHAW
XFree86

KEVIN GLUECK
Texas A&M University

ROB LEMBREE
Metro Link, Inc.

DAVID A. LONG
Metro Link, Inc.

PAUL LUSSIER
Mission Critical Linux

MICHAEL MILLER
The Ohio State University

JEFF SASS
Adobe Systems

DAVE SHREINER
SGI

Art Gallery: N-Space

Beyond Manzanar
Community of People with No Time:
Identity and Collaboration
Curving Spirolaterals 13, 14, 18, 19
Intercere #11, Intercere #17
Old House in the Shadow of the Castle
Transport II, III, IV

Computer Animation Festival 2001: A Digital Odyssey

Early Light
Perestroika

Courses

- 7 A Primer on Shapes: Curves, Surfaces
- 22 Intro to SMIL
- 23 Motion Dynamics Animation Workshop
- 24 Real-time Shading
- 34 An Interactive Introduction to OpenGL Programming
- 38 A Practical Guide to Global Illumination Using Photon Mapping
- 43 Aggressive Performance Optimizations For 3D Graphics
- 47 Simulating Nature: Realistic and Interactive Techniques
- 52 DirectX 8 Graphics
- 53 Geometric Algebra

Educators Program

Adventures in Modeling: Building Systems with StarLogo
Graphics in a Flash: An Introduction to Vector-Based Web Graphics
Life Drawing and 3D Figure Modeling with Maya

Emerging Technologies

Micro Archiving

Panels

Addiction Theory: What Makes a Game Work
Cultural Mediation in New Media Spaces

Papers

An Efficient Representation for Environment Irradiance Maps
An Image-Based Editing System
Constrained Texture Mapping for Polygonal Meshes
Homomorphic Factorization of BRDFs for High-Performance Rendering
Polynomial Texture Maps
Reliable Graphing Methods for Two-Dimensional Implicit Relations

Sketches & Applications

Death Valley Flyby: A Simulation
Comparing Fault-Controlled Alluvial Fans Along the Black Mountain Range
Digital Stupa: Interactive Animations
Open Processes Create Open Products: "Interface Ecology" As A Metadisciplinary Base For CollageMachine
RitSens - Computer Aided System for Studying Rhythmic Abilities in Bimanual Coordination
Sketching Space: Virtual to Real
The Mouthesizer: A Facial Gesture Musical Interface
Using Color-Changing Textiles as a Computer Graphics Display

Pathfinders

Do you have questions about what to see, how to make the best use of your time at the conference, or what best fits your career path? Ask the Pathfinders mentors to help you design a schedule that suits your needs. Whether it is your first SIGGRAPH conference or your 28th, Pathfinders is here to help you get the most out of your conference experience.

Pathfinders was created to help new attendees navigate the massive expanse of activities that each conference presents and provide a connection to the SIGGRAPH community. The hope was to add a sense of belonging to a community, rather than looking at the conference as an isolated event. Now it's clear that Pathfinders is a valuable service for all conference attendees, and the Pathfinders mentors are waiting and willing to help plan your week whether you're a first-timer or a seasoned veteran.

Pathfinders is staffed by mentors who generously volunteer their time to offer one-on-one counseling to attendees. Pathfinders staff and volunteers are long-time attendees who haven't forgotten their first SIGGRAPH conference experiences. They want to pass along their wisdom to help you make the most of an exciting, jam-packed week.

Chair

BARB HELFER
The Ohio State University

Location

South Lobby

Days & Hours

Saturday, 11 August

4 - 8 pm

Sunday, 12 August

9 am - 7 pm

Monday, 13 August

8 am - 6 pm

Tuesday, 14 August

8 am - 6 pm

Wednesday, 15 August

8 am - 5 pm

Thursday, 16 August

8 am - 5 pm

Committee

ANN EAKES
SIGGRAPH 2002 Pathfinders Chair
University of Texas Health Science Center

JESSE HELTON
High Voltage Software

RUEDY W. LEEMAN
Alpine View Images

THERESA-MARIE RHYNE
North Carolina State University

Courses

“Teachers open the door, but you must enter by yourself.” — Chinese Proverb

Full-day, half-day, and tutorial sessions on how to create computer graphics and interactive techniques, improve their application, and use them to achieve practical results in the real world. Full Conference registration allows attendees access to all SIGGRAPH 2001 Courses.

Seating in courses is on a first-come, first-served basis. Seating is very limited for courses scheduled in the Creative Applications Lab.

NEW! Some SIGGRAPH 2001 Courses begin at 10 am on Sunday, 12 August.

Chair

LOU HARRISON
North Carolina State University

Committee

RICK BARRY
Pratt Institute

STEVE HWAN
Walt Disney Feature Animation

ALYCE KAPROW
The New Studio

ANSELMO LASTRA
SIGGRAPH 2000 Courses Chair
University of North Carolina at
Chapel Hill

VAL MILLER
SIGGRAPH 2002 Courses Chair
Georgia State University

NICK ORLANS
MITRE Corporation

NAN SCHALLER
Rochester Institute of Technology

HARRY SMITH
University of North Carolina at
Wilmington

Program Coordinator

KATIE RYLANDER
Capstone Solutions, Inc.

Location

See Pages 16-43

Days & Hours

Half Day AM

Tuesday, 14 August
8:30 am - noon

Half Day PM

Sunday, 12 August
1:30 - 5 pm

Monday, 13 August
1:30 - 5 pm

Tuesday, 14 August
1:30 - 5 pm

Full Day

Monday, 13 August
8:30 am - 5 pm

Tuesday, 14 August
8:30 am - 5 pm

Wednesday, 15 August
10 am - 6 pm

Tutorial

Sunday, 12 August
10 am - noon

Monday, 13 August
10 am - noon

Room 515A 2 - 5 pm	Room 502A 10 am - noon
■ ● ▲ Fundamentals Seminar ● ● BEGINNING INTERMEDIATE ADVANCED Computer graphics jargon, concepts, techniques, and technologies explained by the experts, in plain English. The best starting point for attendees who are new to computer graphics and interactive techniques. MIKE BAILEY San Diego Supercomputer Center and University of California at San Diego WAYNE CARLSON BARB HELFER The Ohio State University JACKIE WHITE California State University, Los Angeles	1 w The Impact of Public Policy on Computer Graphics ● ● BEGINNING INTERMEDIATE ADVANCED As personal computers proliferate and access to the Internet increases use of and access to computer graphics, researchers, developers, and practitioners confront policy and legal issues that increasingly affect their professional activities. This course explores the technical and policy issues associated with intellectual property, digital copy protection, digital and high-definition video, support for computer graphics research, deployment of broadband telecommunications, and the role of technical societies such as SIGGRAPH, ACM, and IEEE. <i>Schedule</i> 10 Introduction and Overview to Public Policy ELLIS AND SIMONS 10:15 Deployment of Broadband Telecommunications ELLIS 10:35 Use and Protection of Intellectual Property (IP) SIMONS 11:05 Digital Copy Protection ELLIS 11:15 Convergence of Computing and Television ELLIS 11:25 Research Support ELLIS 11:35 Public Policy ELLIS AND SIMONS 11:45 Summary and General Discussion ELLIS AND SIMONS <i>Prerequisites</i> Interest in and understanding of the general-public's use of computer graphics and related policy issues are useful. Low-level knowledge of computer graphics technology is not required. <i>Topics</i> Computing and public policy, deployment of broadband telecommunications, use and protection of intellectual property, digital copy protection, convergence of computing and television, research support, and public policy activities. <i>Organizers/Lecturers</i> ROBERT ELLIS ACM SIGGRAPH Public Policy Program Chair BARBARA SIMONS ACM Past President and USACM (ACM U.S. Public Policy Committee) Co-Chair
Conference Registration Categories ■ Full Conference ● Conference Select ▲ Exhibits Plus Courses 1-54 are only open to attendees with Full Conference registration.	
Areas of Interest sfx Animation & Special Effects a Art g/it Game Development & Interactive Techniques vr Virtual Reality w Web-related	

Room 408	10 am - noon	Petree Hall C	10 am - noon
2	sfx g/it	3	g/it
OBTAINING 3D MODELS WITH A HAND-HELD CAMERA		Performance OpenGL: Platform-Independent Techniques	
			
BEGINNING INTERMEDIATE ADVANCED		BEGINNING INTERMEDIATE ADVANCED	
How 3D models can be obtained from images acquired with a hand-held camera. The approach is based on advanced automatic techniques that avoid camera calibration and a prior scene knowledge, which gradually retrieve more and more information about the image, the cameras, and the scene. Applications range from archaeology to planetary exploration. <i>Prerequisites</i> This tutorial is accessible to a wide audience with diverse backgrounds. It requires basic understanding of 3D geometry and perspective projection. A full appreciation of the course requires some knowledge of projective geometry, computer vision, and image-processing techniques. <i>Topics</i> Feature point extraction and matching, multi-view relations, robust matching, projective structure and motion recovery, self-calibration, bundle adjustment, image-pair rectification, dense stereo matching, multi-view matching, 3D surface modeling, and applications. <i>Organizer/Lecturer</i> MARC POLLEFEYS Katholieke Universiteit Leuven		For many novice users of OpenGL, the intricacies of how to achieve optimum performance have never been clearly revealed. This course analyzes some of the inner workings of the OpenGL programming library and discusses how they affect an application's performance. Specific considerations for rendering geometry, specifying image and texture formats, and keeping OpenGL's mechanisms for internal state machine consistent are discussed and demonstrated. <i>Prerequisites</i> Ability to program with the OpenGL interface and an understanding of how to render geometry and images, and control rendering by manipulating OpenGL's state. <i>Topics</i> Methods for rendering geometry. How to determine which approach is the best for your hardware. Analysis of state changes and how to minimize their impact on performance. Performance considerations for saving and restoring state when creating a library, as compared to an application. Techniques for determining the cause of a performance bottleneck. Considerations for managing images and textures for maximum performance. <i>Organizer/Lecturer</i> DAVE SHREINER SGI	
<i>Schedule</i> 10 Introduction POLLEFEYS 10:15 Structure and Motion Recovery - Feature Point Extraction and Matching - Relating Images - Projective Structure and Motion - Self-Calibration POLLEFEYS 11:15 Dense Model Reconstruction - Dense Depth Estimation - Modeling POLLEFEYS 11:45 Examples, Applications and Questions POLLEFEYS		<i>Schedule</i> 10 Rendering Geometry - Different Methods to Render Geometry - Work Per Specified Vertex - Which Vertex Array Type? SHREINER 10:30 State Management - Validation: Keeping OpenGL's State Consistent - State Sorting for Minimizing State Changes - Managing OpenGL State in Application Libraries - Managing Pixel and Texture Data SHREINER 11:30 Bottleneck Determination Techniques - Fill Limited Applications - Geometry Limited Applications - Host Limited Applications SHREINER	

Room 515B

10 am - noon

Room 403

10 am - noon

4

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A SURVEY OF COLOR FOR COMPUTER GRAPHICS

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BEGINNING

INTERMEDIATE

ADVANCED

A survey of color specifically for computer graphics: color vision and perception, color models and representations, algorithms for rendering colored objects and images, tools for design and selection of color, color characteristics of monitors, scanners, and printers. For attendees who want an introduction to color in computer graphics or for those knowledgeable in some aspects of color who want a broader view of the field.

Prerequisites

Understanding of basic scientific and mathematical presentation (simple graphs, diagrams, and equations).

Topics

Color vision and perception, physical and symbolic models for representing color, algorithms for rendering colored objects and images, tools for design and selection of color, monitors, scanners, and printers.

Organizer/Lecturer

MAUREEN STONE
StoneSoup Consulting

Schedule

- 10** **Color Vision and Appearance**
STONE
- 10:30** **Color Reproduction and Management**
STONE
- 11** **Color in Rendered Graphics**
STONE
- 11:30** **Color Selection and Design**
STONE

5

sfx

Visualizing Quaternions

••••••••

BEGINNING

INTERMEDIATE

ADVANCED

An intuitive connection between quaternion lore and many standard problems in representation, interpolation, and exploitation of orientation frames in graphics and visualization. The tutorial presents a range of visualization methods, including images of individual quaternion rotations, the action of rotations in quaternion space, and visual properties of quaternion splines and related animation optimization procedures. It also examines natural applications of quaternions beyond animation splines, such as the study of quaternion frames attached to curves and surfaces.

Prerequisites

Comfort with and appreciation for conventional mathematical methods of 3D computer graphics and geometry used in geometric transformations and polygon rendering.

Topics

Basic methods of orientation frames and orientation interpolation, novel quaternion visualizations that provide alternative intuitions, advanced applications of these quaternion techniques to coordinate frames and animation splines, and interactive visualization tools for quaternion curves relevant to proper construction and understanding of coordinate frame interpolation.

Organizer/Lecturer

ANDREW HANSON
Indiana University

Schedule

- 10** **Introduction to Quaternion Rotation Representations**
HANSON
- 10:15** **2D Rotations**
HANSON
- 10:45** **3D Rotations**
HANSON
- 11:15** **Visualizing Orientation Splines**
HANSON

Room 406

10 am - noon

6

Object Space Visibility

sfx



BEGINNING

INTERMEDIATE

ADVANCED

A survey of object space since the first algorithm was introduced in 1963. In recent years, object-space computation has been considered an esoteric topic of only theoretical interest. But object-space algorithms solve problems, such as the ability to arbitrarily magnify output images, that otherwise require esoteric knowledge using raster-based techniques. By showing a number of problems and their relevance to mainstream and fundamental problems in computer graphics this tutorial stimulates revived interest in object-space computation.

Prerequisites

Familiarity with standard visibility techniques in computer graphics such as scanline rendering and binary space partitioning. Completion of the equivalent of a third-year course on analysis of algorithms in a standard computer science curriculum. Also helpful: a basic foundation in object-oriented terminology and concepts.

Topics

Definition of and the need of object-space computation. Visibility in flatland (in 2D). Visibility in space compared with visibility in the plane. Lines, conics, and quadrics in Euclidean space. Survey of algorithms for visible line determination, visible surface determination, and computation of the visibility map. Performance gap between practical and theoretical visibility algorithms. Research relevance: meshing for radiosity.

Organizer/Lecturer

SHERIF GHALI
Max-Planck-Institut für Informatik

Schedule

- 10** Introduction and Motivation
GHALI
- 10:15** Visibility in the Plane
GHALI
- 10:30** Visible Lines, Surfaces, and the Visibility Map
GHALI
- 10:50** Taxonomy of Object Space Algorithms
GHALI
- 11:50** Conclusion
GHALI

Room 502B

10 am - noon

7

A Primer on Shapes: Curves and Surfaces

CC BY-NC-SA



BEGINNING

INTERMEDIATE

ADVANCED

Shape representations employed for design should enable easy shape specification and modification, while those used for recovery should readily accommodate unstructured shape data. This tutorial investigates curve and surface representations that are effective for shape design and shape recovery. Attendees learn how to choose the representation most appropriate for a given design or recovery task and dataset.

Prerequisites

Some knowledge of parametric curves and surfaces. Familiarity with range and/or tomographic data.

Topics

Parametric curves and surfaces for design. Bézier, B-spline, rational Bézier, NURBS, and dynamic NURBS representations. Design issues. Grouping and parametrizing scattered points for curve and surface fitting. Thin-plate splines. Rational Gaussian curves and surfaces.

Organizers/Lecturers

ARDESHIR GOSHTASBY
Wright State University

ALYN ROCKWOOD
Colorado School of Mines

DEMETRI TERZOPOULOS
New York University

Schedule

- 10** Introduction
ROCKWOOD
- Curves and Surfaces for Shape Design
- 10:05** Bézier
ROCKWOOD
- 10:15** B-spline
ROCKWOOD
- 10:25** NURBS
ROCKWOOD
- 10:45** D-NURBS
TERZOPOULOS
- 10:55** Triangular D-NURBS
TERZOPOULOS
- Curves and Surfaces for Shape Recovery
- 11:10** Thin-Plate Splines
TERZOPOULOS
- 11:25** Rational Gaussian Representation
GOSHTASBY
- 11:40** Grouping and Parametrizing Scattered Points
GOSHTASBY
- 11:55** Summary
GOSHTASBY

Room 404

10 am - noon

Room 511

10 am - noon

8

An Introduction to the Kalman Filter

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BEGINNING

INTERMEDIATE

ADVANCED

The 40-year-old Kalman filter and related optimal estimators continue to appear in a wide variety of computer graphics applications, such as simulating musical instruments in virtual reality, head tracking and motion capture, extracting lip motion from video sequences of speakers, and fitting spline surfaces over collections of points. The Kalman filter is an optimal estimator for a large class of problems and a very effective and useful estimator for an even larger class. In its most basic form it is also relatively simple to use and understand. This tutorial presents an intuitive approach that enables developers to approach the extensive literature with confidence.

Prerequisites

Basic linear algebra. A basic mathematical background sufficient to understand explanations that involve introductory statistics and random signals.

Topics

An intuitive explanation of the filter. The origins and formulations of the filter equations. Practical use of the filter. Approaches for non-linear systems. A brief introduction of advanced topics such as sensor, information, and data fusion; sensitivity and stability concerns; system identification (tuning); multi-modal (multiple-model) approaches; and optimal smoothing.

Organizers/Lecturers

GREGORY WELCH
GARY BISHOP
University of North Carolina at Chapel Hill

Schedule

- 10 **Welcome, Introduction, Intuition**
BISHOP
- 10:30 **Concrete Examples**
WELCH
- 11 **Non-Linear Estimation**
BISHOP
- 11:15 **System Identification and Multi-Modal Filters**
WELCH
- 11:45 **Conclusions (Summary, Resources, etc.)**
WELCH

9

Media-Rich Programming With OpenML

g/it w

●●●●●●●●●●●●●●●●

BEGINNING

INTERMEDIATE

ADVANCED

OpenML is a new industry effort to develop a standard cross-platform environment that supports creation and display of digital media, including audio, video, and graphics. A key OpenML goal is to define standard synchronization primitives that can ensure efficient, accurate, and synchronized delivery of independent digital media streams. This overview of the OpenML effort covers the participants, the charter, deliverables, and ongoing efforts.

Prerequisites

Programming experience in C or C++. Basic knowledge of computer graphics and video hardware. Also helpful: working knowledge of OpenGL and familiarity with video standards and terminology.

Topics

Overview of the Khronos Group SIG and its activities. Architectural overview of the OpenML programming environment. Synchronization primitives and their use: UST, MSC, and SBC. Video back-end control using Wdc/Xdc. OpenGL extensions required for OpenML. Overview of the OpenML API. Application programming considerations.

Organizer

RANDI ROST
3Dlabs, Inc.

Lecturers

BENOIT BELLEY
Discreet

FRANK BERNARD
SGI

WILLIAM CLIFFORD
Intel Corporation

RANDI ROST
3Dlabs, Inc.

Schedule

- 10 **Introduction and Agenda**
ROST
- 10:05 **Khronos Group SIG Overview**
ROST
- 10:10 **OpenML Overview**
ROST
- 10:20 **Synchronization**
CLIFFORD
- 10:25 **Display Control**
CLIFFORD
- 10:35 **OpenGL Requirements**
ROST
- 10:55 **ML Overview**
BERNARD
- 11:15 **Application Programming Considerations**
BELLEY
- 11:35 **Embedded API Initiative**
ROST
- 11:45 **Wrap-Up and Questions and Answers**
CLIFFORD

Half Day		Half Day	
Room 511	1:30 - 5 pm	Room 404	1:30 - 5 pm
10 sfx State of the Art in Modeling and Measuring of Surface Reflection		11 g/it Tracking: Beyond 15 Minutes of Thought	
BEGINNING INTERMEDIATE ADVANCED		BEGINNING INTERMEDIATE ADVANCED	
Surface appearance is at the heart of computer graphics. At the lowest level, it is controlled by the surface bi-directional reflectance distribution function (BRDF), which describes how much light incident from a given direction is being scattered in another direction. Both measuring and modeling of this function have a long history, and active research is continuing. The main goal of the course is to provide a snapshot of the most recent results from the computer graphics community. <i>Prerequisites</i> Familiarity with BRDF formalism and currently used reflection models. Good understanding of the basic physics of light-surface interaction and the fundamental principles of both geometric and wave optics. <i>Topics</i> Fundamentals and different types of simple reflectance measurements. Traditional and image-based BRDF measurement techniques. Reflection models based on the wave theory of light. Models that account for sub-surface scattering. The microfacet theory of surface reflectance. Recent empirical models. <i>Organizer</i> MICHAEL ASHIKHMIN University of Utah <i>Lecturers</i> MICHAEL ASHIKHMIN PETER SHIRLEY University of Utah STEVE MARSCHNER Stanford University JOS STAM Alias/Wavefront		Every year, dozens of vendors display different systems for tracking motion capture at the SIGGRAPH exhibition. Why are there so many different approaches to this seemingly simple problem? How do the systems differ and what are the strengths and limitations of each approach? How can you decide which is appropriate for your application? This course provides a basic understanding of the available technologies and approaches, their fundamental limitations, and how those limitations can become problems. Attendees peek "under the hood" of a few systems so they might better understand system performance (or lack thereof) and improve their results by adjusting set-ups to better match the technology. <i>Prerequisites</i> A basic mathematical background, sufficient to understand explanations that involve beginning statistics, random signals, and geometric transformations. <i>Topics</i> Basic mathematical foundations (statistics, random signals, and transforms). Sensor and system information and uncertainty. Technologies and sensing mediums for tracking. Geometric configurations and related sensitivity. Examples of algorithms for magnetic, inertial, and optical systems. Hybrid technology approaches. Motion prediction (world and body-centric). Sources and propagation of error. <i>Organizers</i> GARY BISHOP GREGORY WELCH University of North Carolina at Chapel Hill <i>Lecturers</i> B. DANETTE ALLEN GARY BISHOP GREGORY WELCH University of North Carolina at Chapel Hill	
<i>Schedule</i> 1:30 Introduction ASHIKHMIN 1:35 Background and Overview • Intuition for Light Reflection • Definitions • Types of Materials • Sources of Data • Practical Issues for Rendering SHIRLEY 2:20 BRDF Measurement • Measurement of Reflectance • Traditional BRDF Measurement • Image-Based BRDF Measurement MARSCHNER 3 Break 3:15 Physics Based Reflection Models I. Wave Based Reflection Models for Computer Graphics • Basics • Derivation • Examples • Future Work II. Reflection Models Accounting for Subsurface Scattering • Formulation of the Problem • Mathematical Formulation • Discretization • General Solution Using Eigenanalysis • Examples • Future Work STAM 4:10 Empirical Reflection Models and Microfacets • Classical Empirical Models • Microfacet Theory • BRDF Generation From a Microfacet Distribution • Simple Anisotropic Phong Model ASHIKHMIN 4:55 Summary, Questions and Answers ALL		<i>Schedule</i> 1:30 Welcome and Introduction BISHOP 1:45 Tracking Technologies ALLEN 2:10 Source/Sensor Configurations BISHOP 2:30 User and Sensor Uncertainty/Information WELCH 3 Break 3:15 Traditional Approaches BISHOP 3:35 Stochastic Approaches WELCH 4 Error Sources (Spatial and Temporal) WELCH 4:25 Motion Prediction BISHOP 4:45 Conclusions (Summary, Resources, etc.) BISHOP	

Room 515B

1:30 - 5 pm

12

g/it vr

Developing Efficient Graphics Software



BEGINNING

INTERMEDIATE

ADVANCED

Architectural considerations and methods for creating high-performance interactive graphics software and analysis techniques for measuring and tuning overall application performance. Analysis methods used to characterize graphics and system performance, and to detect and remove bottlenecks, are explained. The course is designed for software developers who want to optimize graphics and system performance.

Prerequisites

A working knowledge of software development, computer graphics techniques, and overall computer system architecture.

Topics

Interaction among CPUs, bus, memory, and graphics subsystems. General C and C++ optimization techniques. Methods used to measure performance.

Organizer

KEITH COK
SGI

Lecturers

KEITH COK
THOMAS TRUE
SGI

Schedule

- 1:30 Introduction**
COK
- 1:35 Software and System Performance**
a. System Design & Architecture
b. System Performance Analysis
TRUE
- 3 Break**
- 3:15 Code and Language Optimizations**
a. Methods of Measuring Code Performance
b. C/C++ Language Optimizations
COK
- 4:45 Questions and Answers**
COK AND TRUE

Areas of Interest

- sfx** Animation & Special Effects
- a** Art
- g/it** Game Development & Interactive Techniques
- vr** Virtual Reality
- w** Web-related

Petree Hall D

1:30 - 5 pm

13

sfx

Interactive Ray-Tracing



BEGINNING

INTERMEDIATE

ADVANCED

Interactive ray tracing is becoming practical, and it offers a number of benefits over the traditional rasterization pipeline. This course describes implementation and optimization issues for ray tracing on hardware ranging from single PCs to networked clusters and supercomputers. It also reviews recent work to implement ray tracing in hardware as an alternative to current graphics chips.

Prerequisites

This course is designed for anyone who is interested in the future of highly realistic interactive graphics. For best results, attendees should have a decent understanding of the ray-tracing algorithm and the triangle rasterization pipeline of current graphics hardware. Knowledge of distributed, parallel, and SIMD processing is helpful but not required.

Topics

Brief review of the ray-tracing basics. Comparison of ray tracing with the triangle rasterization pipeline. Highly parallel ray tracing on supercomputers. Interactive ray tracing on a PC. Optimizing ray shooting through image-based rendering. Data structures and algorithms for dynamic scenes. Different approaches to designing hardware architecture for real-time ray tracing.

Organizer

PHILIPP SLUSALLEK
Universität des Saarlandes

Lecturers

STEVEN PARKER
ERIK REINHARD
University of Utah

HANSPETER PFISTER
Mitsubishi Electric Research Laboratory

TIMOTHY PURCELL
Stanford University

PHILIPP SLUSALLEK
Universität des Saarlandes

Schedule

- 1:30 Introduction and Motivation**
SLUSALLEK
- 1:50 Parallel Ray-Tracing**
PARKER
- 2:30 Interactive Ray-Tracing on PCs**
SLUSALLEK
- 3 Break**
- 3:15 Distributed Ray-Tracing of Massive Models**
SLUSALLEK
- 3:30 Reprojection and Dynamic Scenes**
REINHARD
- 4 Hardware and Volume Ray-Tracing**
PFISTER
- 4:20 Ray-Tracing on a Chip**
PURCELL
- 4:40 Discussion**
ALL

Petree Hall C

1:30 - 5 pm

Room 502A

1:30 - 5 pm

14

Image-Based Lighting

15

Visualizing Relativity

VR

BEGINNING

INTERMEDIATE

ADVANCED

A survey of recently developed techniques for realistically integrating computer-generated imagery with live-action photography that use measurements of real-world lighting to illuminate CG objects. The techniques are illustrated with detailed breakdowns of the animations "Rendering with Natural Light" and "Fiat Lux," shots from recent feature films, and examples of how they are used in commercial packages such as LightWave 3D. The course concludes with an overview of techniques to extend image-based lighting to people and objects in the real world.

Prerequisites

Basic knowledge of or experience with modeling and rendering in traditional modeling and rendering packages (for example 3D Studio Max, LightWave 3D, Maya, or Softimage). Familiarity with basic traditional CG lighting and compositing. No advanced ray-tracing or global illumination knowledge is assumed.

Topics

High-dynamic-range photography, lighting acquisition, image-based lighting and compositing, real-time techniques, and ongoing research in illuminating real people and objects with sampled light. How the techniques are used in actual productions and with particular software packages. Basic principles of light reflection and global illumination.

Organizer

PAUL DEBEVEC
USC Institute for Creative Technologies

Lecturers

PAUL DEBEVEC
USC Institute for Creative Technologies
DAN LEMMON
Digital Domain

Schedule

1:30 Introduction
DEBEVEC

Global Illumination:
A Brief Overview
LEMMON

2:15 Capturing,
Representing, and
Manipulating High
Dynamic Range
Imagery (HDRI)
DEBEVEC

Capturing Real-
World Illumination
DEBEVEC

Illuminating
Synthetic Objects
With Real Light
DEBEVEC

Making Rendering
With Natural Light
DEBEVEC

3 Break

3:15 Rendering Synthetic
Objects Into Real
Scenes
DEBEVEC

Image-Based
Lighting in "Fiat
Lux"
DEBEVEC

3:40 Image-Based
Lighting With
Commercial
Renderers and in
Commercial
Production
LEMMON

4:15 Image-Based
Lighting Real Objects
and Actors
DEBEVEC

BEGINNING

INTERMEDIATE

ADVANCED

For those who seek a deeper intuitive understanding of the theories of relativity and an introduction to how modern computer graphics techniques can be adapted to visualize and simulate the physics of interacting light and matter under extreme conditions. The first half of the course focuses on how relativistic effects can be intuitively understood starting from Euclidean 3D geometry. The second half concentrates on recent advances in photorealistic simulation of scenes and relativistic phenomena using computer graphics to show features that could never be seen in real life at human time and space scales.

Prerequisites

Substantial familiarity with conventional mathematical methods of 3D computer graphics and prior exposure to 3D rendering techniques. No prior knowledge of the theories of relativity is required. Attendees may find that some of the material covered in Course 5 provides useful background.

Topics

A geometric, intuitive approach to special relativity. Minkowski diagrams. How relativistic transformations are related to familiar geometric concepts used in 3D rotations. Properties of light under the extreme conditions of both special and general relativity: changes of color, intensity, and direction of light, and gravitational light bending. Relativistic rendering techniques.

Organizers/Lecturers

ANDREW HANSON
Indiana University
DANIEL WEISKOPF
Universität Stuttgart

Schedule

1:30 Introduction

- Motivation
- 2D Euclidean vs Minkowski: Build Relativity Concepts From 2D Graphics
- Spacetime Points and the Twin Paradox
- Relativistic Objects, Cameras, and Imaging

HANSON

2:20 Visualization Methods
in 3D and 4D

- 3D=2 Space+1 Time: Transformations
- Multiple Transformations and Thomas Precession
- Aberration of Light
- Object Viewing: Occlusion, IBR, Terrell Effect
- 4D=3 space+1 Time

HANSON

3 Break

3:15 Light

- Fundamentals (Electromagnetic Wave, Photons, Plenoptic Function)
- Relativistic Effects on Light (Aberration, Doppler and Searchlight Effects, Transformation of the Plenoptic Function)
- General Relativistic Effects (Bending Light by Gravity, Gravitational Lensing)

WEISKOPF

3:50 Rendering

- Special Relativistic Rendering Methods (Polygon Rendering, Radiosity, Ray Tracing, Image-Based Rendering, Texture-Based Rendering)
- General Relativistic Rendering (Ray Tracing, Image-Based Rendering)

WEISKOPF

4:35 Interaction Techniques

- Accelerated Motion of an Observer in Special Relativity
- Interactive Virtual Environment

WEISKOPF

4:45 Conclusion

WEISKOPF

4:50 Questions and Answers

ALL

Room 408

1:30 - 5 pm

Room 502B

1:30 - 5 pm

16

g/it

Gaming Techniques for Designing Compelling Virtual Worlds



BEGINNING

INTERMEDIATE

ADVANCED

The world-building tricks of the computer game trade are a multi-billion-dollar competition to build the most enticing and immersive virtual environments. Speakers describe their approaches to designing environments, review their experiences (both good and bad), and showcase their latest technologies.

Prerequisites

None.

Topics

Community building and society design. World navigability by humans and artificially intelligent software agents. People flow and bottlenecks. The impact of design on technology, and of technology on design. Crossover between entertainment systems and military-realm visual simulators.

Organizer

MICHAEL CAPPS
Naval Postgraduate School

Lecturers

YAHN BERNIER
Valve Software

CLIFF BLESZINSKI
SHANE CAUDLE
Epic Games

MICHAEL CAPPS
Naval Postgraduate School

JESSE SCHELL
Walt Disney Imagineering

Schedule

1:30 Introduction
CAPPS

Building a Virtual Reality From Reality

- Worlds With Realistic Terrain
- Building Textured 3D Models From Real Objects
- Case Study and Demonstration

CAPPS

2 Making Compelling Worlds

- Functionality, Flow, and Composition
- Dramatic Lighting and Sound
- Prefabricated Objects
- Case Study and Demonstration: Epic Games' Unreal Engine

BLESZINSKI AND CAUDLE

2:50 Creating Immersive Multiplayer Action Experiences

- Maintaining Immersion and Responsiveness
- Prediction and Extrapolation
- Networking Paradoxes
- Case Study and Demonstration: Valve Software's Half-Life and TeamFortress

BERNIER

3 Break

3:15 Creating Immersive Multiplayer Action Experiences - continued

3:40 Designing for Community

- Lessons From Theme Park Design
- Geography and Motion
- Social Interaction Drives Geography
- Case Study and Demonstration: Disney's Toon Town Online

SCHELL

4:30 Conclusion and Questions and Answers
ALL

17

sfx

Geometric Signal Processing on Large Polygonal Meshes



BEGINNING

INTERMEDIATE

ADVANCED

Very large polyhedral models, which are used in more and more graphics applications today, are routinely generated by a variety of methods such as surface reconstruction algorithms from 3D scanned data, isosurface construction algorithms from volumetric data, and photogrammetric methods from aerial photography. This course provides an overview of several closely related methods designed to smooth, denoise, edit, compress, transmit, and animate very large polygonal models, based on signal-processing techniques, constrained energy minimization, and the solution of diffusion differential equations.

Prerequisites

Some familiarity with basic linear algebra and calculus, basic concepts of meshes, and standard representations of polygonal models.

Topics

Representation and operations on large polygonal meshes. Smoothing techniques. Fourier analysis on meshes and linear filter design. Smoothing with constraints. Smoothing by constrained energy minimization and implicit fairing. Multi-resolution editing and smoothing. Preventing tangential drift by divided differences and curvature flow. Applications to subdivision surfaces. Applications to 3D geometry compression.

Organizers/Lecturers

LEIF KOBELT
Rheinisch-Westfälische Technische Hochschule Aachen

GABRIEL TAUBIN
California Institute of Technology and IBM T. J. Watson Research Center

Schedule

1:30 Introduction

- 1:35
- Representation of Polygonal Models
 - Operations on Large Polygonal Meshes
 - Laplacian Smoothing
 - The Shrinkage Problem
 - Fourier Analysis on Meshes
 - Smoothing by Partial Fourier Expansion
 - Smoothing as Low-Pass Filtering
 - Taubin Smoothing
 - FIR/IIR Filter Design
 - Implicit Fairing/Multi-Resolution Modeling
 - Smoothing With Constraints
 - Preventing Tangential Drift by Curvature Flow
 - Applications to 3D Geometry Compression
 - Optimal Mesh Sampling Rate Conversion
 - Adaptive Curvature-Based Resampling
 - Filtering of Normal and Tensor Fields
 - Non-Linear Filtering/Anisotropic Diffusion

TAUBIN

3 Break

- 3:15
- Multiresolution Representations
 - Coarse-to-Fine (Refinement, Remeshing)
 - Fine-to-Coarse (Simplification)
 - Detail Encoding
 - Fairing by Constrained Energy Minimization
 - General Set-Up
 - Multi-Level Smoothing
 - Fairing by Solving PDEs
 - Linear PDEs
 - Non-Linear PDEs
 - Practical Aspects
 - Multiresolution Editing
 - Static Connectivity
 - Dynamic Connectivity

KOBELT

4:40 Questions and Answers

Room 406

1:30 - 5 pm

West Hall B

1:30 - 5 pm

18

Using Tensor Diagrams to Represent and Solve Geometric Problems

19

"Shrek": The Story Behind the Screen

sfx

BEGINNING

INTERMEDIATE

ADVANCED

Conventional matrix notation for algebraic geometry does not adequately represent some concepts that are important in understanding and manipulating geometrical quantities. Better notational tools can be appropriated from the field of mathematical physics. This course focuses on one such tool, the tensor diagram (which is related to the Feynman diagram), and shows how it can improve notational convenience, solve many geometrical problems that would otherwise be very complicated, and facilitate understanding of the algebraic structure of such problem.

Prerequisites

Familiarity with homogeneous-coordinate geometry and basic matrix operations. Distaste for page-long algebraic expressions.

Topics

Review of homogeneous-coordinate math. Notational problems with matrices. Einstein Index notation. How tensor diagrams represent basic operations. Application of tensor diagrams to: 1D homogeneous equations (polynomials), 2D homogeneous equations (curves), 3D homogeneous equations (surfaces). Unsolved (at least to the knowledge of the speaker) problems.

Organizer/Lecturer

JAMES F. BLINN
Microsoft Research

Schedule

- 1:30 Background and Goals**
 • Basic Homogeneous (Projective) Geometry
 • Problems With Conventional Notation
 BLINN
- 2 Overview of Tensor Diagrams**
 • How They Solve Notational Problems
 • Some Examples
 • General Principles of Application
 BLINN
- 2:30 1D Homogeneous Problems (Polynomials)**
 • Second Order Roots and Resultants
 BLINN
- 3 Break**
- 3:15 1D Homogeneous Problems - continued**
 BLINN
- 3:45 2D Homogeneous Problems (Curves)**
 • Intersections and Tangency
 • Pascal's Theorem
 • Curve Shape Catalogs
 BLINN
- 4:30 3D Homogeneous Problems (Surfaces)**
 • A Few Results
 BLINN
- 4:45 Review of Main Points and Unsolved Problems**
 BLINN

BEGINNING

INTERMEDIATE

ADVANCED

Creating a computer-generated feature-length movie requires an idea, the ability to visually develop the idea, and the tenacity to perform the arduous task of producing it. This course offers both an overall and a technical perspective on the PDI/DreamWorks movie-making process with a focus on some of the key areas in production of "Shrek": art direction, character development, simulation, effects, lighting, and digital storytelling.

Prerequisites

Basic understanding of the principles of computer graphics and animation.

Topics

From "Antz" to "Shrek." What is design? Generic character variations. The use of simulation in a computer-generated feature production. "Shrek" effects and lighting. CG infrastructure. CG movie making. Staying innovative.

Organizers

RACHEL FALK
LINDA RAE SANDE
PDI/DreamWorks

Lecturers

ANDREW ADAMSON
KEN BIELENBERG
GEORGE BRUDER
JUAN BUHLER
JAMES HEGEDUS
ARNAULD LAMORLETTE
LUCIA MODESTO
SCOTT SINGER
SCOTT PETERSON
VANITHA RANGARAJU
ROB VOGT
MARK WENDELL
PDI/DreamWorks

Schedule

- 1:30 Introduction**
 JEFFREY KATZENBERG
- 1:40 From ANTZ to SHREK**
 BIELENBERG
- 1:55 CG Infrastructure**
 BRUDER
- 2:10 Production Design for Digital Motion Pictures**
 HEGEDUS
- 2:30 Generic Character Variations**
 MODESTO AND RANGARAJU
- 3 Break**
- 3:15 The Use of Simulation**
 VOGT AND SINGER
- 3:40 SHREK Effects**
 LAMORLETTE AND PETERSON
- 4:30 SHREK Lighting**
 WENDELL

Room 403

1:30 - 5 pm

West Hall A

1:30 - 5 pm

20

sfx

Advanced Global Illumination



BEGINNING

INTERMEDIATE

ADVANCED

The fundamentals of light transport and techniques for computing the global distribution of light in a scene. All three components of a physically based renderer (material descriptions and scene geometry, simulation of light transport, and output of images) are explained, starting from fundamental principles. The main focus is on light-transport simulation, since the quality and efficiency of a photo-realistic renderer is determined by its global illumination algorithm.

Prerequisites

A basic understanding of classic photo-realistic rendering algorithms, such as basic ray tracing and radiosity. Very helpful: knowledge of probability theory. Useful but not necessary: some familiarity with transport equations and radiometry.

Topics

Short overview of rendering. Radiometry and the rendering equation. General strategies for global illumination algorithms. Path tracing techniques. Stochastic radiosity algorithms. Current state of the art in photo-realistic rendering research.

Organizers

PHILIP DUTRÉ
KAVITA BALA
Cornell University

Lecturers

KAVITA BALA
PHILIP DUTRÉ
Cornell University
PHILIPPE BEKAERT
Max-Planck-Institut für Informatik

Schedule

- 1:30 Introduction**
DUTRÉ
- 1:40 Radiometry and the Rendering Equation**
BALA
- 2:10 Strategies for Solving the Rendering Equation**
DUTRÉ
- 3 Break**
- 3:15 Stochastic Radiosity**
BEKAERT
- 4:20 Trends, Future Research, Conclusions**
DUTRÉ, BALA AND BEKAERT

21

sfx

Seeing is Believing: Reality Perception in Modeling, Rendering, and Animation



BEGINNING

INTERMEDIATE

ADVANCED

Advances in image synthesis techniques allow very precise simulation of light-energy distribution in a scene. Unfortunately, this does not ensure that the displayed image will have a high-fidelity visual appearance. This course addresses techniques to compare real and synthetic images, and identify important visual system characteristics. The ultimate result: significantly reduced rendering times. Case studies involving both static and dynamic images are presented, and their different perception-metric requirements are compared and contrasted.

Prerequisites

Appreciation of the need for perception evaluation. No prior knowledge of metrics is assumed, although knowledge of human vision and image-quality metrics may be an advantage.

Topics

The nature of images; relevant issues in human visual perception and their investigation using psychophysical methods; computational models of perception including spatial-frequency and orientation channels and visual masking; computational metrics including visual difference predictors, the Sarnoff model, and animation quality metrics; and psychophysical evaluation of image quality.

Organizers

ALAN CHALMERS
University of Bristol
ANN McNAMARA
The University of Dublin

Lecturers

ALAN CHALMERS
University of Bristol
SCOTT DALY
Sharp Laboratories of America, Inc.
ANN McNAMARA
The University of Dublin
KAROL MYSZKOWSKI
Max-Planck-Institut für Informatik
HOLLY RUSHMEIER
IBM T.J. Watson Research Center
TOM TROSCIANKO
University of Sussex

Schedule

- 1:30 Introduction to the Perception of Reality**
CHALMERS
- 1:40 Psychophysical Image Quality Metrics**
McNAMARA AND TROSCIANKO
- 3 Break**
- 3:15 Computational Image Quality Metrics**
DALY
- 3:50 Metrics and Geometric Simplification**
RUSHMEIER
- 4:10 Applications in Rendering and Animation**
MYSZKOWSKI
- 4:45 Summary, Discussion and Questions**
ALL

Tutorial

Half Day

CAL

10 am - noon

22

Intro to SMIL



•••••

BEGINNING

INTERMEDIATE

ADVANCED

SMIL (Synchronized Multimedia Integration Language) is an XML-based language that allows authors to write interactive multimedia presentations. Authors can specify the temporal behavior of a presentation, associate hyperlinks with media objects, and describe the layout of the presentation. In this tutorial, attendees learn the syntax of SMIL and author their own interactive presentations.

Prerequisites

A basic understanding of raw HTML.

Topics

Review of HTML and XML. Why we need SMIL. Current authoring tools and players. SMIL syntax.

Organizer/Lecturer

KATHY BARSHATZKY
Visual Book Productions, Inc.

Schedule

- 10 **HTML: Markup History, Definitions and Problems**
BARSHATZKY
- 10:20 **XML and DTD; SMIL is XML-Based**
BARSHATZKY
- 10:45 **SMIL Players and Authoring Tools**
BARSHATZKY
- 11 **SMIL Syntax**
BARSHATZKY

CAL

1:30 - 5 pm

23

Motion Dynamics Animation Workshop



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BEGINNING

INTERMEDIATE

ADVANCED

This hands-on workshop introduces animators to the principles and techniques of motion-dynamics animation. Participants use workstations running Maya to understand the principles and apply them to a short animation project. A team of experienced animation assistants provides assistance.

Prerequisites

Familiarity with the basic concepts and practice of 3D computer animation. Experience with motion dynamics or Maya software is not required.

Topics

The principles and practice of motion-dynamics simulations. Physical properties of objects, forces, collisions, rigid bodies and soft bodies, springs, and goal objects. Playback issues. Combining keyframed animation with motion-dynamics simulations.

Organizer/Lecturer

MICHAEL O'ROURKE
Pratt Institute

Schedule

- Part 1: Rigid-Body Dynamics
- 1:30 **Lecture**
O'ROURKE
- 1:45 **Demonstration**
O'ROURKE
- 2 **Tutorial Exercises**
O'ROURKE & ANIMATION ASSISTANTS
- 3 **Break**
- Part 2: Soft-Body Dynamics
- 3:15 **Lecture**
O'ROURKE
- 3:30 **Demonstration**
O'ROURKE
- 3:45 **Tutorial Exercises**
O'ROURKE & ANIMATION ASSISTANTS

Areas of Interest

- Animation & Special Effects
- Art
- Game Development & Interactive Techniques
- Virtual Reality
- Web-related

Petree Hall D

8:30 am - 5 pm

West Hall A

8:30 am - 5 pm

24

Real-Time Shading

sfx g/it



25

Physically Based Modeling

sfx



BEGINNING

INTERMEDIATE

ADVANCED

Formerly titled Approaches for Procedural Shading on Graphics Hardware, this course explains the techniques behind shading on current and future graphics hardware, from full procedural shading on advanced specialized hardware to limited, yet still surprisingly flexible, shading on unextended OpenGL, to the latest in PC graphics accelerators. Attendees see several systems in action and learn the basic techniques in a series of technology overviews.

Prerequisites

Working knowledge of a modern real-time graphics API like OpenGL. Familiarity with the concepts of procedural shading.

Topics

How interactive procedural shading can be implemented using advanced programmable hardware, with more modest extensions to graphics hardware, or even on existing graphics hardware. SIMD rendering hardware, parameterized and procedural solid texturing, hardware extensions, multi-pass rendering, and new graphics APIs.

Organizer

MARC OLANO
SGI

Lecturers

JOHN C. HART
University of Illinois at Urbana-Champaign
WOLFGANG HEIDRICH
The University of British Columbia
ERIK LINDHOLM
NVIDIA Corporation
MICHAEL MCCOOL
University of Waterloo
BILL MARK
Stanford University
MARC OLANO
SGI
KEN PERLIN
New York University

Schedule

- 8:30 Introduction
OLANO
- 8:40 In the Beginning: The Pixel Stream Editor
PERLIN
- 8:55 Pixel Flow Shading
OLANO
- 9:25 Hardware Shading Effects
HEIDRICH
- 10 Break
- 10:15 Shading Through Multi-Pass Rendering
OLANO
- 10:50 Vertex Shaders
LINDHOLM
- 11:25 Stanford Real-Time Programmable Shading System
MARK
- noon Lunch
- 1:30 Noise Hardware
PERLIN
- 2:05 Sampling Procedural Shaders
HEIDRICH
- 2:25 Procedural Solid Texturing
HART
- 3 Break
- 3:15 SMASH
McCOOL
- 3:30 Multi-Pass RenderMan
OLANO
- 4:10 Analysis of Shading Pipelines
HART
- 4:35 Panel-Style Questions and Answers
ALL



BEGINNING

INTERMEDIATE

ADVANCED

For researchers and implementers who hope to develop a solid understanding of physical methods as applied to animation and modeling, and particularly for attendees who want to implement physically based modeling techniques, and/or to read and critically appraise technical papers in the area. Bolstered by the extensive course notes, at the end of the course, students with good basic implementation skills should be able to implement the technique, not by rote but confidently and with understanding.

Prerequisites

A good working familiarity with mainstream computer graphics modeling and animation. In addition to the usual graphics math skills (familiarity with matrix and vector manipulations, and the like), a basic calculus course.

Topics

Modeling the dynamics of particle systems and rigid bodies. Basic numerical methods for differential equations, including implicit methods. Simulation of deformable surfaces. Collision and contact between objects.

Organizer

ANDREW WITKIN
Pixar Animation Studios

Lecturers

DAVID BARAFF
MICHAEL KASS
ANDREW WITKIN
Pixar Animation Studios

Schedule

- 8:30 Introduction
- 8:45 Differential Equation Basics
WITKIN
- 9:30 Particle Dynamics
WITKIN
- 10 Break
- 10:15 Particle Dynamics - continued
WITKIN
- 10:30 Implicit Methods
BARAFF
- 11:15 Cloth and Fur Energy Functions
KASS
- noon Lunch
- 1:30 Rigid Body Dynamics
BARAFF
- 2:15 Constrained Dynamics
WITKIN
- 3 Break
- 3:15 Collision and Contact
BARAFF
- 4 Dynamics in Monsters, Inc.
ALL

Room 515B

8:30 am - 5 pm

26

w

Internetworked 3D Computer Graphics: Overcoming Bottlenecks, Supporting Collaboration, and Stepping up to Wireless Connectivity



BEGINNING

INTERMEDIATE

ADVANCED

Networking concepts and issues for using and developing interactive and collaborative Internet-based graphics applications, including mobile, wireless, and wearable computing. Real-time demonstrations and case-study implementations are highlighted and summarized during the entire course. Also featured: first-hand examples of the capabilities and tradeoffs involved when interactive 3D graphics are combined with the Web and live information streams across the Internet.

Prerequisites

Understanding of the fundamentals of an Introduction to Computer Graphics course and some prior experience in creating computer graphics content or a 3D application. Familiarity with computer graphics primitives. Advanced knowledge of networking infrastructure concepts is not required.

Topics

The six components of Internetworked 3D Graphics (connectivity, content, interaction, economics, applications, and personalization). The realities of implementing internetworked 3D Graphics (latency, content distribution, packet management, synchronization, geometry streaming, and large-world database management). The basics of the Internet Protocol. The Distributed Interactive Simulation (DIS) protocol, Wireless Application Protocol, and other behavior protocols. Fundamentals of collaborative 3D graphics applications and how they relate to Internet Engineering Task Force (IETF) standards.

Organizers

THERESA-MARIE RHYNE
North Carolina State University

ROBERT BARTON
Fraunhofer Center for Research in Computer Graphics

Lecturers

DON BRUTZMAN
Naval Postgraduate School

GRANTLEY DAY
Electronic Arts Inc.

MICHAEL MACEDONIA
US Army STRICOM

THERESA-MARIE RHYNE
North Carolina State University

NORBERT SCHIFFNER
Fraunhofer Center for Research in Computer Graphics

Schedule

- 8:30 Introduction**
RHYNE AND BARTON
- 8:35 Overview of 3D Interactive Graphics Using the Internet**
RHYNE
- 9:05 The Realities of Implementing Internetworked 3D Graphics**
DAY
- 10 Break**
- 10:15 Internetworked Graphics: Capabilities, Shortfalls, Frontiers**
BRUTZMAN
- 11 MBONE and Virtual Environment Demonstration**
BRUTZMAN AND ALL INSTRUCTORS
- noon Lunch**
- 1:30 Integrating IETF Standards With 3D Programming Paradigms & Issues in Distributed Virtual Environments**
BARTON
- 2:15 Collaborative Virtual Reality Demonstration**
BARTON
- 3 Break**
- 3:15 Distributed Experiences**
MACEDONIA
- 4 Distributed Virtual Environment and Game Demonstrations**
MACEDONIA AND ALL INSTRUCTORS

Room 403

8:30 am - 5 pm

27

g/it

vr

Augmented-Reality: The Interface is Everywhere



BEGINNING

INTERMEDIATE

ADVANCED

As computers become more and more invisible, and Augmented-reality (AR) allows developers to overlay virtual images on the real world, the user interface can literally be placed everywhere. This course gives attendees the background, skills, and software necessary to start developing AR applications. It summarizes important research areas such as tracking and registration, interaction techniques, wearable AR systems, and hybrid AR interfaces. And it introduces attendees to ARToolKit, a software library they can use to build their own applications.

Prerequisites

Basic familiarity with 3D computer graphics, familiarity with virtual reality concepts and technology, and the mathematical principles commonly used in developing graphics applications. Programming experience with the OpenGL API.

Topics

Augmented-reality interface technology. Head tracking for AR. Interaction techniques for AR. Collaborative AR applications. Heterogeneous AR user interfaces. Mobile indoor and outdoor AR. Developing AR applications using ARToolkit.

Organizers

DIETER SCHMALSTIEG
Technischen Universität Wien

MARK BILLINGHURST
The University of Washington

Lecturers

RONALD AZUMA
HRL Laboratories, LLC

MARK BILLINGHURST
The University of Washington

TOBIAS HÖLLERER
Columbia University

HIROKAZU KATO
Hiroshima City University

IVAN POUPYREV
Sony Computer Science Laboratories, Inc.

DIETER SCHMALSTIEG
Technischen Universität Wien

Schedule

- 8:30 Welcome**
SCHMALSTIEG AND BILLINGHURST
- 8:40 Introduction**
AZUMA
- 9:30 Tracking**
AZUMA
- 10 Break/Demo Setup**
- 10:15 Interaction**
POUPYREV
- 11:15 Collaborative Augmented Reality**
BILLINGHURST
- noon Lunch/Demo Session**
- 1:30 Heterogeneous Augmented-Reality**
SCHMALSTIEG
- 2:40 Mobile Augmented-Reality**
HÖLLERER
- 3 Break/Demo Setup**
- 4 AR ToolKit**
KATO
- 5 Questions and Answers**
ALL

Room 502B	8:30 am - 5 pm	Room 515A	8:30 am - 5 pm
28 Introduction to Computer Graphics 		29 State of the Art in Monte Carlo Ray Tracing for Realistic Image Synthesis 	
BEGINNING	INTERMEDIATE	BEGINNING	INTERMEDIATE
ADVANCED		ADVANCED	
This course helps newcomers ease into the SIGGRAPH conference experience. It introduces fundamental computer graphics ideas and vocabulary at a level that novices can easily comprehend. With slides, videotapes, online demos, and source code (available on the Courses CD-ROM and the Web), attendees learn to understand, appreciate, enjoy, and learn from other SIGGRAPH 2001 programs and events. <i>Prerequisites</i> A basic understanding of computers and algebra. <i>Topics</i> Computer graphics from data to photons. Fundamentals of geometry, interaction, hardware, modeling, rendering, and animation. Computer graphics applications such as scientific visualization, virtual reality, and Web graphics. <i>Organizer</i> MIKE BAILEY San Diego Supercomputer Center and University of California at San Diego <i>Lecturers</i> MIKE BAILEY San Diego Supercomputer Center and University of California at San Diego ANDREW GLASSNER Writer and Consultant	<i>Schedule</i> 8:30 Welcome Overview of the Course Overview of the Graphics Process Graphics to Look At BAILEY 9 Modeling GLASSNER 10 Break 10:15 Rendering GLASSNER 11:15 Graphics Display Hardware BAILEY noon Lunch 1:30 Animation GLASSNER 2:30 Scientific Visualization BAILEY 3 Break 3:15 More Scientific Visualization BAILEY 3:30 Input Devices BAILEY 3:45 Graphics on the World Wide Web BAILEY 4 How to Attend a SIGGRAPH Conference BAILEY 4:15 Finding Additional Information BAILEY 4:30 Questions and General Discussion GLASSNER AND BAILEY	Realistic image synthesis is increasingly important in areas such as entertainment, design, and architecture, and in all these areas, practitioners are requesting more realistic images of increasingly complex models. Only Monte Carlo ray tracing techniques can handle this complexity. This course gives attendees a thorough understanding of the principles of Monte Carlo ray tracing methods and a detailed overview of the most recently developed techniques. <i>Prerequisites</i> Good working knowledge of ray tracing and the basics of global illumination, including knowledge of radiometric terms (such as radiance and flux) and basic reflection models (such as diffuse, specular, and glossy). <i>Topics</i> Basic Monte Carlo integration. Low-discrepancy sequences. Sampling of BRDF's, lights, and geometry. Variance reduction techniques. Path integral formulation. Path tracing and bi-directional path tracing. Metropolis light transport. The scattering equation. Biased techniques. Irradiance caching and photon mapping. <i>Organizer</i> HENRIK WANN JENSEN Stanford University <i>Lecturers</i> JAMES ARVO California Institute of Technology MARCOS FAJARDO USC Institute for Creative Technologies PAT HANRAHAN HENRIK WANN JENSEN Stanford University DON MITCHELL MATTHEW PHARR Exluna, Inc. PETER SHIRLEY University of Utah	<i>Schedule</i> 8:30 Introduction and Welcome JENSEN 8:35 Fundamentals of Monte Carlo Integration SHIRLEY 9:15 Quasi-Monte Carlo Techniques MITCHELL 10 Break 10:15 Sampling Techniques ARVO 11 Direct Illumination SHIRLEY 11:30 Variance Reduction Techniques ARVO noon Lunch 1:30 Solving the Rendering Equation HANRAHAN 2:30 Metropolis Sampling PHARR 3 Break 3:15 Scattering Equations PHARR 3:45 Monte Carlo Ray Tracing in Action FAJARDO 4:05 Biased Techniques JENSEN 5 Conclusion and Questions ALL

Room 404

8:30 am - 5 pm

30

g/it vr

Visibility: Problems, Techniques, and Applications

Visibility determination (the process of deciding what surfaces can be seen from a certain point) is one of the fundamental problems in computer graphics. Its importance has long been recognized, and in network-based graphics, virtual environments, shadow determination, global illumination, culling, and interactive walkthroughs, it has become a critical issue. This course reviews fundamental issues, current problems, and unresolved solutions, and presents an in-depth study of the visibility algorithms developed in recent years, focusing on occlusion culling techniques.

Prerequisites

Understanding of the basics of 3D graphics. The course is not designed for experts in visibility.

Topics

Occlusion culling techniques, visibility complex, view volume culling, image space and object-space methods, the use of BSP trees and other hierarchical structures for visibility, solutions in games, hardware-assisted occlusion culling.

Organizer

DANIEL COHEN-OR
Tel Aviv University

Lecturers

YIORGOS CHRYSANTHOU
University College London

DANIEL COHEN-OR
VLADLEN KOLTUN
Tel Aviv University

FREDO DURAND
Massachusetts Institute of Technology

NED GREENE
NVIDIA Corporation

CLAUDIO T. SILVA
AT&T Labs

Schedule

8:30 Course Introduction
COHEN-OR

8:40 An Overview of the
Fundamental
Definitions and
Concepts
DURAND

9:40 Hierarchical
Techniques for
Culling
CHRYSANTHOU

10 Break

10:15 Hierarchical
Techniques for
Culling - continued
CHRYSANTHOU

10:40 Object Space
Techniques
SILVA

noon Lunch

1:30 Image Space
Techniques
GREENE

2:15 Viewspace
Partitioning and
From-Region
Visibility
COHEN-OR

3 Break

3:15 Area Visibility
KOLTUN

4:20 Hardware-Assisted
Occlusion-Culling
GREENE

5 Final Questions and
Discussion

Room 406

8:30 am - 5 pm

31

vr

Computer Graphics for
Large-Scale Immersive Theaters

Large-scale video projection of immersive environments is revolutionizing planetaria and dome theaters worldwide. Using multiple edge-blended video projectors, these systems project ultra-wide-field-of-view, high-resolution images on dome screens. This course surveys large-scale immersive video systems offered by major manufacturers and showcases several new installations and their productions. Industry leaders provide a comprehensive look at both real-time and pre-rendered immersive video production techniques for entertainment and education applications.

Prerequisites

General knowledge of basic computer graphics theory and practice, including perspective projection, modeling, rendering, and animation. Also helpful: general knowledge of video projection and visual display basics.

Topics

Immersive show production philosophy and spherical projection basics including edge-blended video projection. Production techniques: spherical rendering, cubic rendering, image stitching, spherical image mapping, real-time multi-pipe image generation, and group interactivity with real-time graphics systems.

Organizer

ED LANTZ
Spitz, Inc.

Lecturers

CARTER EMMART
American Museum of Natural History

ED LANTZ
BRAD THOMPSON
Spitz, Inc.

MARTIN RATCLIFFE
Exploration Place, Inc.

BEN SHEDD
Princeton University and Shedd
Productions, Inc.

Schedule

8:30 Introduction to
Large-Scale
Immersive Theaters
LANTZ

9:15 Principles of
Immersive Imagery
SHEDD

10 Break

10:15 Spherical Image
Generation and
Projection
LANTZ

11 Immersive Rendering
Basics
THOMPSON

noon Lunch

1:30 Immersive Rendering
Basics - continued
THOMPSON

2 Tools and Techniques
for Real-Time Dome
Production and
Education
EMMART

3 Break

3:15 Real-Time Interactive
Show Production for
the Boeing Cyber
Dome
RATCLIFFE

4:15 Immersive Rendering
Examples and Case
Studies

5 Wrap-Up and
Questions and
Answers
LANTZ

Petree Hall C

8:30 am - 5 pm

Room 502A

8:30 am - 5 pm

32

sfx a

Nonphotorealistic Rendering in Scientific Visualization

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BEGINNING

INTERMEDIATE

ADVANCED

For graphics researchers and practitioners who want to understand how to create expressive nonphotorealistic images that can be interpreted effectively by the human visual system: An introduction to art theory and art history, painterly techniques, nonphotorealistic rendering, and visual perception, and their application in computer graphics. The course includes an in-depth description of stylistic techniques in sketching and painting, followed by an explanation of their correspondence to human perception. Then it focuses on how these results can be applied to real computer graphics applications, including scientific and information visualization, volume rendering, and image synthesis.

Prerequisites

Some experience in graphics and/or visualization. Not required: prior knowledge of or background in artistic techniques or perceptual psychology.

Topics

Building from fundamental artistic theory and styles and issues of low-level human vision, the course proceeds to a higher-level discussion of how to use this information to solve specific problems in computer graphics and scientific visualization.

Organizer

CHRISTOPHER G. HEALEY
North Carolina State University

Lecturers

CHRISTOPHER G. HEALEY
North Carolina State University

VICTORIA INTERRANTE
University of Minnesota

DAVID KREMERS
California Institute of Technology

DAVID LAIDLAW
Brown University

PENNY RHEINGANS
University of Maryland, Baltimore County

Schedule

- 8:30 **Introduction**
LAIDLAW
- 8:40 **Artistic Enhancement in Scientific Visualization**
INTERRANTE
- 10 **Break**
- 10:15 **Participant Painting Session, Introduction**
LAIDLAW AND KREMERS
- 10:55 **Participant Painting Session**
KREMERS (AND OTHER INSTRUCTORS)
- noon **Lunch**
- 1:30 **Participant Painting Session – continued**
KREMERS (AND OTHER INSTRUCTORS)
- 2:15 **Impressionism, Perception, and Multidimensional Visualization**
HEALEY
- 3 **Break**
- 3:15 **Artistic Inspiration for Volume Rendering**
RHEINGANS
- 3:50 **Expressive Volume Rendering**
RHEINGANS
- 4:30 **Beyond Perceptual Psychology With Oil Painting**
LAIDLAW
- 5:10 **Conclusions and Wrap-up**

33

sfx

New Directions in Shape Representations

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BEGINNING

INTERMEDIATE

ADVANCED

Several recently developed shape representations go beyond conventional surface and volume representations, and offer advantages for compression, transmission, editing, rendering, and complex shapes. In this course, some of the world's leading computer graphics researchers summarize the state of the art in shape representations and provide detailed information, including pseudo-code, on how to implement the various techniques. The course includes hands-on experience with various applications, including face modeling, sculpting, and 3D scanning of real-life objects.

Prerequisites

Familiarity with advanced 3D graphics techniques.

Topics

Displaced subdivision surfaces. Digital geometry processing with semi-regular meshes. Surface elements as rendering primitives. Wavelets as volume primitives. Adaptively sampled distance fields. Image-based representations. The course concludes with a panel on the future of alternative shape representations followed by an open discussion with the audience.

Organizers

HANSPETER PFISTER
Mitsubishi Electric Research Laboratory

ALYN ROCKWOOD
Colorado School of Mines

Lecturers

SARAH FRISKEN
RONALD PERRY
HANSPETER PFISTER
Mitsubishi Electric Research Laboratory

MARKUS GROSS
Eidgenössische Technische Hochschule Zürich

LEONARD McMILLAN
Massachusetts Institute of Technology

HENRY MORETON
NVIDIA Corporation

ALYN ROCKWOOD
Colorado School of Mines

WIM SWELDENS
Lucent Technologies, Bell Laboratories

Schedule

- 8:30 **Welcome and Introduction**
PFISTER
- 8:45 **Motivation and Overview**
ROCKWOOD
- 9:15 **Displaced Subdivision Surfaces**
MORETON
- 10 **Break**
- 10:15 **Normal Meshes**
SWELDENS
- 11:15 **Point-Based Graphics and Visualization**
PFISTER
- noon **Lunch**
- 1:30 **Surface Representations and Signal Processing**
GROSS
- 2:15 **ADFs - Adaptively Sampled Distance Fields**
FRISKEN AND PERRY
- 3 **Break**
- 3:15 **Image-Based Representations**
McMILLAN
- 4:15 **Questions and Answers**
- 4:45 **Adjourn**

Room 408	8:30 am - 5 pm	See below for location	9 am - 5 pm
34 User-Interface Design for Work, Home, and on the Way ▲	W GCAL	35 The Technology and Practice of Digital Cinema (D-cinema) ▲	a
BEGINNING	INTERMEDIATE	BEGINNING	INTERMEDIATE
ADVANCED		ADVANCED	
Skillful graphic design of graphical user interfaces for networked or stand-alone performance or productivity tools, mobile devices, information-appliances, and the Web, is critical to the success of innovative products. This course gives software developers, visual designers, interaction designers, marketers, and business managers valuable insight into essential design issues and how to achieve powerful, effective visual communication that improves usability and appeal. Extensively illustrated lectures cover perceptual, conceptual, and communication issues in typography, symbol systems, color, spatial composition, animation, and sequencing.	<i>Schedule</i> 8:30 Visual Communication Principles MARCUS 9:30 Grids ALL 10 Break 10:15 Semiotics, Icon Design ALL 11:15 Icon Design Project ALL noon Lunch 1:30 Graphic Design of Dialogue ALL 2:30 Dialogue Design Project ALL 3 Break 3:15 Designing Applications for the Web CHEN 3:45 Extreme Design of Baby Faces MARCUS 4 Metaphor Design and Project ALL	HDTV equipment using the 1920 x 1080 image format now achieves spatial resolution comparable to film. Efforts are nearly complete to adapt HDTV cameras and recorders to the 24 frames per second of film. And electronic projection now matches the brightness and spatial resolution of the cinema. This course describes the technology of D-cinema acquisition and display, and discusses the interface between D-cinema and digital-image creation and editing.	<i>Schedule</i> 9 Introduction POYNTON 9:15 D-cinema Acquisition MEYERS 10 Break 10:15 DLP Cinema Technology (Projection) WERNER 11:15 Color Representation for D-cinema, I HARRISON noon Lunch 1:30 Color Representation for D-cinema, II HARRISON 1:45 Color Management for D-cinema RAMAMURTHY 3 Break 3:15 Mastering Movies for a Digital Release KERLOW 4:30 Questions and Answers ALL
<i>Prerequisites</i> None.		<i>Prerequisites</i> Some experience creating or manipulating digital images. Familiarity with film or video, and with color science and color image coding, perhaps gained through attending a color course at a previous SIGGRAPH conference.	
<i>Topics</i> Market: existing national and global products and customer bases, including cross-cultural issues. Compatibility: corporate clients with multiple user interfaces, browsers, platforms. Industry standards: ISO, ANSI, intellectual property, and CHI/IEEE activities. Branding: establishment of strong corporate and product identity. Development environment: establishment of user-interface design teams. User-centered design: customizability for developers and end users. Productivity: relation to documentation, training, and marketing.		<i>Topics</i> D-cinema image coding, acquisition, real-time recording, color issues, display technology, transfer of film to D-cinema release, and D-cinema exhibition.	
<i>Organizer</i> AARON MARCUS Aaron Marcus and Associates, Inc.		<i>Organizer</i> CHARLES POYNTON	
<i>Lecturers</i> LUKE BALL EUGENE CHEN LARRY GUAN URI KOCHAVI AARON MARCUS Aaron Marcus and Associates, Inc.		<i>Lecturers</i> CHUCK HARRISON Far Field Associates, LLC ISAAC KERLOW The Walt Disney Company FRED MEYERS Industrial Light + Magic CHARLES POYNTON ARJUN RAMAMURTHY Warner Bros. BILL WERNER Texas Instruments Incorporated	<i>Location</i> The Digital Cinema Course will be held at the University of Southern California, Digital Cinema Laboratory at the Pacific Theatre, Hollywood Boulevard and Wilcox Avenue. Buses will depart from the LACC (outside West Hall A) to the Pacific Theatre starting at 7:45 am and returning to LACC at 5:15 pm. The trip is about 30 minutes. A taxi ride, if you'd rather not wait for the bus, will be about \$20 and should take about 20 minutes. The course is intended as a full-day event. There will be two short breaks and a lunch break. There will be a small selection of food available for purchase at the theatre, and there are several restaurants within a couple blocks of the theatre.

West Hall B

8:30 am - 5 pm

Room 511

8:30 am - 5 pm

36

a

From Ivory Tower to Silver Screen: Visual Effects Companies Reveal How Research and Development Finds its Way Into Production



BEGINNING

INTERMEDIATE

ADVANCED

At the local multiplex, we experience incredible images that make us cheer for the computer-generated hero, laugh when a pig converses with a dog, or cower at monsters that exist only as pixels. Those effects start in the minds of artists, scholars, programmers, and scientists who turn their work into images that manipulate space, animate extinct species, or make time stand still. In this course, presenters from six top visual effects companies discuss the many ways they used research to augment production of this year's major feature films, including "How the Grinch Stole Christmas," "Monsters, Inc.," "Shrek," "Stuart Little 2," and "AI."

Prerequisites

Some understanding of computer graphics and visual effects. Interest in visual effects production, film making, software development, research and development, and the production pipeline.

Topics

Production and R&D pipelines. Use of scientific research as a function separate from and integrated into production. Fur creation and dynamics. Researching and creating feathers and flight. Human perception as it applies to 3D stereoscopic images. Photomodeling and hair combing. Tracking, volumetrics, rendering, modeling, lighting, and other visual effects techniques.

Organizers

JILL SMOLIN
Cinesite

PAM HOGARTH
Gnomon School of Visual Effects

Lecturers

ARMIN BRUDERLIN, JAY K. REDD
Sony Pictures Imageworks Inc.

BOB COOK, JOHN GIBSON,
DOUG ROBLE
Digital Domain

MICHAEL FONG, MARK HENNE
Pixar Animation Studios

TONY HUDSON
STEVE SULLIVAN

Industrial Light + Magic

Schedule

8:30 Introduction
SMOLIN

8:45 Pixar
FONG AND HENNE

9:45 Sony Pictures
Imageworks
BRUDERLIN, SUMIDA,
AND REDD

10 Break

10:15 Sony Pictures
Imageworks
- continued
BRUDERLIN, SUMIDA,
AND REDD

11 The Secret Lab
LEWIS AND OLIVER

noon Lunch

1:30 PDI/DreamWorks
SMITH AND SENESHEN

2:30 Digital Domain
COOK, ROBLE, AND
GIBSON

3 Break

3:15 ILM
SULLIVAN AND HUDSON

4:40 Closing Comments
SMOLIN

JOHN P. LEWIS
DAVID OLIVER
The Secret Lab

WILLIAM SENESHEN
SIMON J. SMITH
PDI/DreamWorks

STUART SUMIDA
California State University at
San Bernardino

37

Commodity-Based Scalable Visualization



BEGINNING

INTERMEDIATE

ADVANCED

A new approach to scalable graphics systems proposes to assemble clusters of PC-like nodes that include 3D hardware acceleration. This clustering approach can also be used to drive multiple displays arranged in a tiled configuration that generates a single high-resolution display. The challenge is to demonstrate that the aggregate performance of such systems can be harnessed effectively, especially for large datasets. This course surveys efforts to develop such systems.

Prerequisites

Interest in parallel graphics and visualization for large graphics and visualization applications. Some familiarity with 3D graphics systems and applications.

Topics

Scalable graphics architectures, scientific visualization, parallel visualization and rendering (polygonal and volume), graphics sorting, PC graphics, display technology and tiled-display systems, and hardware integration approaches for building cluster-based graphics systems. How parallel rendering can be achieved on clustered architectures. Overview of recent results.

Organizer

CONSTANTINE PAVLAKOS
Sandia National Laboratories

Lecturers

MATTHEW ELDRIDGE
GREG HUMPHREYS
Stanford University

ADAM FINKELSTEIN
Princeton University

RANDALL FRANK
Lawrence Livermore National Laboratory

ALAN HEIRICH
Compaq Computer Corporation

ALLEN MCPHERSON
Los Alamos National Laboratory

CONSTANTINE PAVLAKOS
Sandia National Laboratories

Schedule

8:30 Introduction/
Motivation
PAVLAKOS

9 Parallel Rendering
Overview
ELDRIDGE

10 Break

10:15 Graphics Cluster
Components and
Clustering Issues,
Graphics Hardware
and Interconnects
FRANK

11 Tiled Displays
FINKELSTEIN

noon Lunch

1:30 Overview of Existing
Systems and Current
Results, DOE Lab
Efforts
PAVLAKOS AND
MCPHERSON

2:30 Stanford's Multi-
Graphics Research
HUMPHREYS

3 Break

3:15 Princeton's Scalable
Display Research
FINKELSTEIN

3:45 Compaq/Tandem's
Compositing
Network
HEIRICH

4:15 An Open-Source,
Parallel Rendering
API Effort
HUMPHREYS

4:45 Closing Remarks
ALL

Room 515A

8:30 am - noon

Room 404

8:30 am - noon

38

sfx



A Practical Guide to Global Illumination Using Photon Mapping



BEGINNING

INTERMEDIATE

ADVANCED

An advanced half-day course on efficient and practical implementation of global illumination and shading algorithms based on photon maps. The presentation covers efficient techniques and data structures for generating photon maps, including projection maps and Russian-roulette-based sampling; how to efficiently integrate information from photon maps in shading algorithms to render global illumination effects such as caustics, color bleeding, and participating media; how to use importance to build more efficient and compact photon maps; and several useful and practical tricks that significantly improve the speed of the photon map method.

Prerequisites

A good working knowledge of global illumination algorithms, especially Monte Carlo ray-tracing-based methods.

Topics

Photon tracing, photon scattering, building the photon map, rendering of caustics, color bleeding, participating media (including subsurface scattering), visual importance, and recent research in photon mapping.

Organizer

HENRIK WANN JENSEN
Stanford University

Lecturers

PER H. CHRISTENSEN
Square USA

HENRIK WANN JENSEN
Stanford University

FRANK SUYKENS
Katholieke Universiteit Leuven

Schedule

- 8:30 Introduction and Welcome
JENSEN
- 8:35 Overview of Global Illumination
JENSEN
- 8:50 Photon Tracing: Building the Photon Maps
JENSEN
- 9:30 Rendering Using Photon Mapping
JENSEN
- 10 Break
- 10:15 Importance Sampling With the Photon Map
SUYKENS
- 10:45 Making the Photon Map Faster
CHRISTENSEN
- 11:15 Photon Maps in RenderPark
SUYKENS
- 11:30 Photon Maps in Movie Production
CHRISTENSEN
- 11:45 Final Remarks and Questions
JENSEN

39

vr

3D Hardcopy: Converting Virtual Reality to Physical Models



BEGINNING

INTERMEDIATE

ADVANCED

Traditionally, computer graphics has rendered 3D virtual objects in 2D, but the latest 3D rapid-prototyping technologies can quickly and easily transform a 3D computer model into a physical 3D model. In this course, attendees learn about commercial rapid-prototyping systems and promising new technologies. The course also covers software techniques used to transform a VR model into realizable geometry and a process plan for a rapid-prototyping system. Speakers present case studies from a variety of application areas.

Prerequisites

Some familiarity with 3D geometric modeling concepts.

Topics

Overview and comparison of commercial 3D rapid-prototyping systems and processes still under development. Software techniques, interchange issues, and process planning. Case studies, from visualization models to working prototype parts.

Organizers

SARA McMAINS
CARLO SÉQUIN
University of California, Berkeley

Lecturers

MIKE BAILEY
San Diego Supercomputer Center and
University of California at San Diego

RICHARD CRAWFORD
University of Texas at Austin

SARA McMAINS
CARLO SÉQUIN
University of California, Berkeley

Schedule

- 8:30 Introduction
McMAINS
- 8:40 Commercial 3D Rapid Prototyping Processes
BAILEY, SÉQUIN, AND CRAWFORD
- 9:45 New Processes With New Materials
CRAWFORD
- 10 Break
- 10:15 Software and Interchange Issues
McMAINS
- 10:45 Application Areas
BAILEY, SÉQUIN, AND CRAWFORD
- 11:45 Summary, Questions and Answers

Room 404

1:30 - 5 pm

40

sfx

PRACTICAL PARALLEL PROCESSING FOR TODAY'S RENDERING CHALLENGES



BEGINNING

INTERMEDIATE

ADVANCED

High-quality images and animations can be rendered in reasonable time with parallel processing. But careful planning is required, to balance the processing load and reduce communication between subtasks for faster processing. This course reviews the basic issues involved in rendering within a parallel or distributed computing environment. It presents various methods for dividing the original rendering problem into subtasks and distributing them efficiently to independent processors. It also examines the strengths and weaknesses of multiprocessor machines and networked render farms for graphics rendering.

Prerequisites

Some knowledge of rendering techniques (ray tracing, radiosity, and Renderman). No prior knowledge of parallel or distributed processing is assumed.

Topics

Basic issues involved in rendering in a parallel environment: task subdivision, load balancing, task communication, task migration, and data management. Parallel rendering systems. Rendering techniques and hardware.

Organizers

ALAN CHALMERS
University of Bristol
TIMOTHY DAVIS
Clemson University

Lecturers

ALAN CHALMERS
University of Bristol
TIMOTHY DAVIS
Clemson University
TOSHIAKI KATO
Square USA
ERIK REINHARD
University of Utah

Schedule

- 1:30 Introduction
DAVIS
- 1:40 Parallel/Distributed Rendering Issues
CHALMERS
- 2:20 Classification of Parallel Rendering Systems
DAVIS
- 2:40 Practical Applications – Distributed Computing and Spatial/Temporal Coherence
DAVIS
- 3 Break
- 3:15 Practical Applications – Real-Time Ray Tracing
REINHARD
- 4 Practical Applications – The Kilauea Massively Parallel Ray Tracer and “Final Fantasy”
KATO
- 4:45 Summary
CHALMERS
- 4:50 Discussion and Questions
ALL

Room 515A

1:30 - 5 pm

41

How to Give a Great SIGGRAPH Talk



BEGINNING

INTERMEDIATE

ADVANCED

According to urban legend, opinion polls reveal that human beings fear public speaking more than death. One of the most demanding public-speaking environments is the annual SIGGRAPH conference, where audience expectations are dauntingly high. There are specific, practical ways to make public speaking less terrifying, and to create presentations that will satisfy even a SIGGRAPH audience. This course shows how to prepare and deliver a great talk that is appropriate for Papers, Panels, Courses, Sketches & Applications, or even the real world beyond SIGGRAPH.

Prerequisites

None.

Topics

Identifying your subject. Organizing your thoughts. Preparing a proposal. Creating great slides and notes. Getting permissions. Text and imagery. Creating course notes. File formats, fonts, graphics, and other production issues. Mental preparation for the talk. Physical aspects of performance (how to stand, move, breathe). How to begin and end. Effective use of two slide projectors. Using video. Giving demonstrations. What to do if you panic. Handling equipment malfunctions.

Organizer

CHARLES POYNTON

Lecturers

JAMES F. BLINN
Microsoft Research
ANDREW GLASSNER
Writer and Consultant
BARBARA MORRIS
CHARLES POYNTON

Schedule

- 1:30 Morris
- 2 Blinn
- 2:45 Poynton
- 3 Break
- 3:15 Poynton
- 3:45 Glassner
- 4:30 Questions and Answers
ALL

Room 515B

8:30 am - 5 pm

CAL

8:30 am - 5 pm

42

Seeing in 3D

sfx a

43

Aggressive Performance
Optimizations for 3D Graphics

vr



BEGINNING

INTERMEDIATE

ADVANCED

BEGINNING

INTERMEDIATE

ADVANCED

"Stand a cube on its corner. What is the shape of a horizontal cross-section taken at half the height of this object?" About four percent of human beings can reason about 3D space well enough to answer this question easily and confidently. For most of us, 3D problems lead to confusion or even panic. This course offers a series of exercises for thinking in 3D. The result: attendees can develop 3D thinking skills independently.

Prerequisites

Familiarity with some basic geometric ideas, such as "two planes meet in a straight line." No serious math required.

Topics

Why we don't think in 3D. Optical illusions. Principles and examples of 3D thinking. Problems that are simpler in 3D. Applications: road safety. The consequences of 3D thinking.

Organizers/Lecturers

GEOFF WYVILL
University of Otago
BOB PARSLow
Consultant

Schedule

- 8:30 Introduction
1D and 2D Thinking
Cube Puzzles
Building Shapes in Layers
WYVILL AND PARSLow
- 10 Break
- 10:15 The Eye, Illusions
Lines and Cubes
WYVILL AND PARSLow
- noon Lunch
- 1:30 Solids of Intersection
Origami and Tensegrity
WYVILL AND PARSLow
- 3 Break
- 3:15 Illusions and Road Safety
Understanding Structure
Questions and Wrap-Up
WYVILL AND PARSLow

Areas of Interest

- sfx Animation & Special Effects
- a Art
- g/it Game Development & Interactive Techniques
- vr Virtual Reality
- w Web-related

Through hands-on experience with actual performance measurements, analysis, and optimizations using well-established methodologies and techniques, this course imparts a working knowledge of performance optimizations for 3D graphics programs in relationship to algorithmic design, coding, and data representation. Attendees learn tool usage and optimization methodology in a series of exercises on actual, platform-independent code. Approaches include: 3D algorithmic optimizations and restructuring for target platforms, performance analysis with available profiling and event-based tools, coding techniques for performance, and data representation for efficient processing on target platform/CPU architectures.

Prerequisites

Basic knowledge of C++ and introductory knowledge of platform architecture.

Topics

Hardware: platform architecture, basic CPU architecture including SIMD extensions, memory subsystems, graphics cards. Software: data representation and organization and how it affects performance, code optimizations, memory optimizations, SIMD optimizations, high-level algorithmic optimizations.

Organizer

HAIM BARAD
Intel Corporation

Lecturers

HAIM BARAD
DEAN MACRI
KIM PALLISTER
Intel Corporation
ERIC HAINES
Autodesk, Inc.
ALEX KLIMOVITSKI
Intel Corporation

Schedule

- 8:30 Welcome and Overview
BARAD
- 8:45 3D Algorithmic Optimizations
HAINES
- 10 Break
- 10:15 Implementations for Bandwidth Reduction
PALLISTER
- 11:30 Architecture and Microarchitecture Issues
BARAD
- noon Lunch
- 1:30 Optimizations Lab
KLIMOVITSKI
- 3 Break
- 3:15 Analysis Tools and Lab
MACRI
- 4:25 3D Optimizations for Handhelds
BARAD
- 4:55 Summary, Wrap-Up, Questions, Feedback
ALL

Room 408

8:30 am - 5 pm

44

g/it vr

Advanced Topics in 3D User Interface Design



BEGINNING

INTERMEDIATE

ADVANCED

3D interaction allows users to perform tasks freely in three dimensions rather than within the limited 2D desktop metaphor of conventional graphical interfaces. This course builds on a SIGGRAPH 2000 Course, "3D User Interface Design: Fundamental Techniques, Theory, and Practice," to present a more detailed discussion of implementation issues and strategies, including the mathematical basis for various techniques and software tools. It also reviews strategies for 3D interface design, methods for integrating diverse interaction techniques into applications, methods for usability evaluation of 3D interfaces, and 3D interaction in specialized interface styles such as augmented-reality and ubiquitous computing.

Prerequisites

Familiarity with basic concepts in human-computer interaction and/or user interfaces. Basic knowledge of 3D graphics and virtual environments. Knowledge of or experience with simple 3D interaction techniques for navigation, selection and manipulation, and system control.

Topics

Implementation details of fundamental 3D interaction techniques for navigation, selection, manipulation, and system control. Advanced 3D interaction techniques, metaphors, and design strategies. How to integrate interaction techniques into a consistent and usable application. Methods and approaches for usability evaluation and analysis of 3D interaction. 3D interaction in augmented-reality environments.

Organizer

DOUG BOWMAN
Virginia Tech

Lecturers

DOUG BOWMAN
Virginia Tech

MARK MINE

Walt Disney Imagineering

JOSEPH LAVIOLA

Brown University

IVAN POUPYREV

Sony Computer Science Labs

Schedule

- 8:30 **Welcome and Introduction**
BOWMAN
- 8:40 **Review of 3D Technology**
LAVIOLA
- 9:15 **Basic 3D Interaction Techniques**
BOWMAN
- 10 **Break**
- 10:15 **Advanced 3D Interaction Techniques**
LAVIOLA
- 11:00 **Interaction Metaphors and Strategies**
POUPYREV
- 11:30 **Adapting 2D Interfaces to 3D Applications**
LAVIOLA
- noon **Lunch**
- 1:30 **3D Interaction in Non-Immersive Environments**
POUPYREV
- 2:30 **Evaluation of 3D Interfaces**
BOWMAN
- 3 **Break**
- 3:15 **Industrial Perspective on 3D Interfaces**
MINE
- 4:15 **Panel Discussion**
ALL

Room 502B

8:30 am - 5 pm

45

sfx g/it

Advanced Issues in Level of Detail



BEGINNING

INTERMEDIATE

ADVANCED

Level of Detail (LOD) methods have been established as crucial tools for managing scene complexity in interactive 3D graphics. This advanced course addresses current research, including LOD error metrics, appearance-preserving simplification, variable-precision rendering, controlled reduction of topology during simplification, memory-coherent simplification, and view-dependent LOD. It also explores related questions in perceptual psychology: What degradation of detail will be perceptible? What tradeoff between fidelity and frame rate is appropriate for different tasks?

Prerequisites

Knowledge of the basic LOD concept and experience with interactive graphics systems. Some experience with LOD. A desire to become a sophisticated LOD user.

Topics

LOD creation: appearance-preserving simplification, parallel LOD computation, controlled topology reduction. Alternative LOD frameworks: dynamic and view-dependent LOD, memory-coherent and out-of-core LOD. Underpinnings: classifying LOD error metrics, perceptual analysis of degradation in detail, the fidelity/performance tradeoff, other perceptual issues.

Organizer

DAVID LUEBKE
University of Virginia

Lecturers

JONATHAN COHEN
The Johns Hopkins University

DAVID LUEBKE
University of Virginia

MARTIN REDDY
SRI International

AMITABH VARSHNEY
University of Maryland

BENJAMIN WATSON
Northwestern University

Schedule

- 8:30 **Welcome, Introductions**
LUEBKE
- 8:50 **Frameworks: Static Versus View-Dependent LOD**
LUEBKE
- 10 **Break**
- 10:15 **Algorithms: Algorithms and Approaches for Simplification**
VARSHNEY
- 11:30 **Fidelity: Measuring Error and Preserving Appearance**
COHEN
- noon **Lunch**
- 1:30 **Fidelity - continued**
COHEN
- 2 **Perception: Understanding and Applying Visual Perception**
REDDY
- 3 **Break**
- 3:15 **Tradeoffs: Balancing Fidelity and Performance**
WATSON
- 4:30 **Panel: Issues, Trends, and Important Questions in LOD**
ALL

Room 406

8:30 am - 5 pm

Petree Hall D

8:30 am - 5 pm

46

Acquisition and Visualization of Surface Light Fields

47

Simulating Nature:
Realistic and Interactive Techniques

sfx a



BEGINNING

INTERMEDIATE

ADVANCED

BEGINNING

INTERMEDIATE

ADVANCED

Light fields parameterized on the geometry of an object offer a natural and intuitive description of complex radiance data. Unfortunately, acquisition, efficient representation, and fast rendering of surface light fields pose many problems. This course describes several practical methods for registering the radiance data of physical objects with their geometry and presents different surface light field representations that are compact and suitable for interactive rendering.

Prerequisites

Basic knowledge of rendering and illumination, including reflectance models, shading, and texture mapping. Some knowledge of 3D modeling from images is helpful but not required.

Topics

Geometry reconstruction, acquisition of light field data, recovering reflectance models from photographs, compression and synthesis of reflectance data, surface light field representations, hardware-accelerated rendering of surface light fields, surface light fields for computer games and visualization.

Organizer

RADEK GRZESZCZUK
Intel Corporation

Lecturers

JEAN-YVES BOUGUET
RADEK GRZESZCZUK
Intel Corporation
LEONARD McMILLAN
Massachusetts Institute of Technology
HANSPETER PFISTER
Mitsubishi Electric Research Laboratory
MARC POLLEFEYS
Katholieke Universiteit Leuven
YOICHI SATO
The University of Tokyo
DANIEL WOOD
University of Washington
YIZHOU YU
University of Illinois at Urbana-Champaign

Schedule

- 8:30 Introduction
GRZESZCZUK
- 8:45 Basic Techniques of Acquiring Surface Light Fields
BOUGUET
- 9:30 3D Scanning Using the Image-Based Visual Hull
McMILLAN
- 10 Break
- 10:15 Acquisition of Light Field Data Using Hand-Held Camera
POLLEFEYS
- 11:15 Recovering Reflectance Models of Real Scenes From Photographs
YU
- noon Lunch
- 1:30 Surface Light Fields for 3D Photography
WOOD
- 2:15 Point-Sample Rendering for Visualization of Surface Light Fields
PFISTER
- 3 Break
- 3:15 Eigen-Texture Method for Compression and Synthesis of Reflectance Data
SATO
- 4 Hardware-Accelerated Rendering of Surface Light Fields
GRZESZCZUK
- 4:45 Questions and Answers
ALL

Research and production perspectives on the difficult task of photo-realistic modeling, rendering, and animation of natural phenomena. Presentations include: physics-based approaches for modeling and animating water, waves, and oceanscapes; real-time, rapid, stable dynamics for water and gas animation; procedural and physics-based approaches for fast, realistic modeling of smoke and steam; procedural volumetric techniques and interactive approximation for modeling and animating clouds; interactive grammar-based techniques for modeling plants and plant ecosystems; and fractal techniques for simulating mountainous landscapes and interactive navigable worlds. Most of the techniques can be adapted for interactive simulations and real-time applications.

Prerequisites

Familiarity with standard graphics techniques for modeling and rendering. Familiarity with basic grammar-based modeling, procedural techniques, and particle systems is helpful.

Topics

Fractal-based techniques for simulating mountains and interactive, navigable planets. Realistic modeling and rendering of oceanscapes viewed from above or below. Stable and interactive simulation of motion in fluids. Volumetric procedural cloud modeling and realtime issues for simulating volumetric natural phenomena (smoke, fog, clouds, water). Rapid realistic smoke simulation. Interactive grammar-based techniques for modeling of plants and plant ecosystems.

Organizer

DAVID S. EBERT
Purdue University

Lecturers

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Purdue University
RON FEDKIW
Stanford University
F. KENTON MUSGRAVE
Pandromeda, Inc.
PRZEMYSŁAW PRUSINKIEWICZ
University of Calgary
JOS STAM
Alias|Wavefront
JERRY TESSENDORF
Cinesite

Schedule

- 8:30 Introduction
EBERT
- 8:45 Fractal Landscapes in Their Natural Context
MUSGRAVE
- 9:45 Water More Real Than Real
TESSENDORF
- 10 Break
- 10:15 Water More Real Than Real – continued
TESSENDORF
- 11 Stable Simulation of Fluids
STAM
- noon Lunch
- 1:30 Realistic Physics-Based Smoke Simulation
FEDKIW
- 2:30 Procedural Volumetric Cloud Modeling, Animation, and Real-Time Techniques
EBERT
- 3 Break
- 3:15 Procedural Volumetric Cloud Modeling, Animation, and Real-Time Techniques – continued
EBERT
- 3:45 Modeling Plants and Plant Ecosystems
PRUSINKIEWICZ
- 4:45 Panel Session Questions and Answers
ALL

West Hall B	8:30 am - 5 pm	Room 511	8:30 am - 5 pm
48	sfx	49	sfx
Advanced RenderMan 3		Image Processing for Volume Graphics	
.....▲..... BEGINNING INTERMEDIATE ADVANCED The RenderMan standard and its several implementations have been used by many large and small animation production studios to create high-quality, often photorealistic, imagery for television and motion pictures. Much of the power of the system is due to its flexibility and extensibility, which enable users to customize the system for situations that were not envisioned by the original implementers. This course goes beyond the basics presented in The RenderMan Companion and teaches advanced techniques that are being used (or should be) in turn-of-the-millennium special-effects productions. <i>Prerequisites</i> Thorough knowledge of 3D image synthesis and computer graphics illumination models. C programming. Strongly recommended: previous experience with the RenderMan Shading Language. <i>Topics</i> Modern methods of generating geometric data and handling geometric complexity, advanced shading language techniques, and use of advanced local and global illumination concepts for photorealistic imagery. <i>Organizer</i> LARRY GRITZ Exluna, Inc. <i>Lecturers</i> TONY APODACA Pixar Animation Studios KEVIN BJORKE Square USA, Inc. LARRY GRITZ MATT PHARR Exluna, Inc. CHRISTOPHE HERY Industrial Light + Magic LAWRENCE TREWEEK Sony Pictures Imageworks	<i>Schedule</i> 8:30 Introduction GRITZ 9 Remedial RenderMan APODACA 10 Break 10:15 Global Illumination in RenderMan GRITZ 11:05 Advanced Surface Reflection Models PHARR noon Lunch 1:30 Rendering Crowds in Star Wars: Episode I HERY 2:30 RenderMan in Final Fantasy BJORKE 3 Break 3:15 RenderMan in Final Fantasy BJORKE 3:45 Volumetric Effects in Hollow Man TREWEEK 4:45 Techniques Panel ALL	▲..... BEGINNING INTERMEDIATE ADVANCED Advanced volume processing enables filtering, interpolation, reconstruction, feature extraction, and model fitting. This course covers reconstruction of continuous models from sampled data, application of transfer functions for shading and classification, and segmentation and projection of the reconstructed values for rendering. The goal is to illuminate structures within the data without generating unwanted artifacts or masking detail. <i>Prerequisites</i> Basic knowledge of 3D computer graphics and an understanding of the basic principles of image processing. <i>Topics</i> The mathematics of effective volume visualizations and the processes by which they are created. Emerging topics in volume-data processing, including level sets, shape extraction using adaptive deformable systems, and model-based segmentation. <i>Organizers</i> TERRY S. YOO US National Library of Medicine RAGHU MACHIRAJU The Ohio State University <i>Lecturers</i> GUIDO GERIG University of North Carolina at Chapel Hill IOANNIS KAKADIARIS University of Houston RAGHU MACHIRAJU The Ohio State University TORSTON MOELLER Simon Fraser University ROSS WHITAKER University of Utah TERRY S. YOO US National Library of Medicine	<i>Schedule</i> 8:30 Introduction to Volume Data for Computer Graphics YOO 8:40 Filtering and Frequency Fundamentals YOO 9:10 Linear Filtering and Filter Design MACHIRAJU AND MOELLER 10 Break 10:15 Feature Detection for Volume Rendering MOELLER AND MACHIRAJU noon Lunch 1:30 Introduction to Nonlinear Filtering YOO 1:45 Elastically Adaptive Deformable Models KAKADIARIS 2:20 Model Based Segmentation GERIG 3 Break 3:15 Level Sets WHITAKER 4:45 Wrap-Up YOO AND MACHIRAJU

50

Digital Geometry Processing

g/it w

51

Making Motion Capture Useful

BEGINNING

INTERMEDIATE

ADVANCED

BEGINNING

INTERMEDIATE

ADVANCED

Traditionally, fine-detail geometry is represented through unstructured polygonal meshes, which are awkward for editing, filtering, and compression applications. This course proposes a new paradigm based on semi-regular meshes constructed through a process of recursive quadrissection, which, according to recent research, has many advantages. Presenters show how to build semi-regular meshes from unstructured polygonal meshes and raw range data, and how to build applications such as filtering, editing, simulation, and compression using semi-regular meshes.

Prerequisites

Familiarity with basic graphics algorithms. Some prior exposure to polygonal meshes.

Topics

3D acquisition: geometry reconstruction, denoising, appearance acquisition, multi-view integration. Semi-regular meshes: definition, properties, inherent advantages, construction, normal meshes, conversion from other formats. Subdivision and details as a natural replacement for classical Fourier analysis to arbitrary topology surfaces. Hierarchical editing: applications of digital geometry, processing algorithms in interactive modeling and physical simulation. Simulation: Use of multi-resolution geometry in physical modeling for animation, engineering design, and scientific computing. Compression: wavelets on semi-regular meshes, lifting, progressivity, zero-tree coding, quantization, rate-distortion trade-offs.

Organizers

PETER SCHRÖDER
California Institute of Technology

WIM SWELDENS
Lucent Technologies, Bell Laboratories

Lecturers

BRIAN CURLESS
University of Washington

IGOR GUSKOV
California Institute of Technology

PETER SCHRÖDER
California Institute of Technology

WIM SWELDENS
Lucent Technologies, Bell Laboratories

DENIS ZORIN
New York University

Schedule

8:30	Introduction SWELDENS
9	Geometry and Appearance Acquisition CURLESS
10	Break
10:15	Semi-Regular Mesh Creation I SWELDENS
11	Semi-Regular Mesh Creation II GUSKOV
noon	Lunch
1:30	Subdivision SCHRÖDER
2	Multiresolution Editing and Processing ZORIN
3	Break
3:15	Compression SCHRÖDER
4	Demos

Schedule

8:30	Overture: Animation From Observation, The End-to-End Process of Motion Capture GLEICHER AND WILSON
8:45	I Can See It - Why Can't the Computer? Sensing Humans - The Need for Engineering Solutions FERRIER
9:30	We're Not Done Yet? Sensing Isn't Everything; Issues in Representing Human Motion GLEICHER
10	Break
10:15	It's About the Performance, Baby - The Mocap Pipeline Planning and Executing a Mocap Shoot TOLLES AND WILSON

noon	Lunch
1:30	What Happens to Your Data After it's Shot; Motion Capture Processing GLEICHER AND WILSON
3	Break
3:15	Quick - We Need a Dancing Duck! GARDNER
3:45	Computer Puppetry: On-line Motion Capture SHIN
4:30	Success Stories and Discussion ALL

Room 403

8:30 am - 5 pm

52

DirectX 8 Graphics

g/it



BEGINNING

INTERMEDIATE

ADVANCED

DirectX 8 graphics blends new ease-of-use components with advanced features like vertex and pixel-level programmable shading languages, higher-order surface support, and modeling tool plug-ins for enabling content creation. In this course, attendees learn the basic rules of DirectX 8 graphics programming and how to apply DirectX 8 capabilities to their own work. It reviews both the legacy, fixed-function pipeline and the new, programmable pipeline, with special attention focused on the vertex and pixel shader systems.

Prerequisites

Basic understanding of beginning-level 3D graphics concepts, such as that taught in the SIGGRAPH beginning graphics course, and an understanding of computer programming. Familiarity with a graphics API such as OpenGL and a shader language system such as RenderMan is helpful but not required. C++ syntax is used for the majority of the course. The shader language exposed in DirectX 8 graphics uses an assembly syntax.

Topics

The basics of DirectX 8 graphics programming. The real-time programmable pipeline exposed in DirectX 8 graphics. The support provided in the D3DX helper library and the authoring tool support.

Organizer

PHILIP TAYLOR
Microsoft Corporation

Lecturers

CHAS BOYD
ANUJ GOSALIA
PHILIP TAYLOR
Microsoft Corporation

Schedule

- 8:30 **Introduction**
TAYLOR
- 8:45 **Design Goals and Architecture**
BOYD
- 9:15 **Programming Model**
TAYLOR
- 10 **Break**
- 10:15 **Vertex Processing**
TAYLOR
- noon **Lunch**
- 1:30 **Pixel Processing**
BOYD
- 3 **Break**
- 3:15 **Pixel Lighting**
BOYD
- 4:45 **Support (High-Order Surfaces, D3DX, Authoring Tool Support)**
GOSALIA
- 5:55 **Conclusion and Questions and Answers**
ALL

Petree Hall C

8:30 am - 5 pm

53

Geometric Algebra

BEGINNING

INTERMEDIATE

ADVANCED

Geometric algebra unifies many different and redundant mathematical systems in current use, and it has wide application in computer graphics: kinematics and dynamics, simplicial calculations (polygons, FEM), fluid flow, collision detection, quaternion splines, elastic deformations, curve and surface definition, vector fields, etc. In this course, attendees explore a new, fundamental language for the mathematics of computer graphics, as well as for modeling and interactive techniques in general.

Prerequisites

An interest in the mathematical fundamentals of computer graphics. Familiarity with vector calculus, complex analysis, homogeneous coordinates, and linear algebra. A reasonable level of mathematical maturity ensures optimum absorption of the breadth of topics presented.

Topics

An introduction to geometric algebra. An improved model for generalized homogeneous space, fast intersection methods of planes and spheres, new ways to view conformal maps, interactive projective geometry, methods for articulated systems and robotics, shape extraction and motion capture from scenes, elastic reformatations and educational implications.

Organizers

AMBJORN NAEVE
Royal Institute of Technology
ALYN ROCKWOOD
Colorado School of Mines

Lecturers

CHRIS DORAN
JOAN LASENBY
Cambridge University
LEO DORST
The Universiteit van Amsterdam
DAVID HESTENES
Arizona State University
STEPHEN MANN
University of Waterloo
AMBJORN NAEVE
Royal Institute of Technology
ALYN ROCKWOOD
Colorado School of Mines

Schedule

- 8:30 **Introduction**
ROCKWOOD AND NAEVE
- 8:45 **What is Geometric Algebra?**
ROCKWOOD AND HESTENES
- 10 **Break**
- 10:15 **GABLE: An Online MATLAB Tutorial**
DORST AND MANN
- 11 **Application of GA**
LASENBY AND DORAN
- noon **Lunch**
- 1:30 **Application of GA – continued**
LASENBY AND DORAN
- 2 **GA-Software for School Math Education Reform**
HESTENES AND NAEVE
- 2:30 **Geo-Metric-Affine-Projective Computing**
NAEVE AND HESTENES
- 3 **Break**
- 3:15 **GABLE Tutorial on Models of Euclidean Geometry**
DORST AND MANN
- 3:45 **Homogeneous Computational Geometry**
HESTENES AND ROCKWOOD

Full Day

CAL

10 am - 6 pm

54

An Interactive Introduction to OpenGL Programming

g/it



BEGINNING

INTERMEDIATE

ADVANCED

OpenGL is the mostly widely supported programming library in the computer graphics industry. It is used in almost every area of computer graphics: academic research, scientific visualization, interactive entertainment, computer-aided design and engineering, gaming, and many more. This thorough introduction to programming with the OpenGL API uses interactive tutorial programs and techniques to introduce advanced topics like simulating light effects and texture mapping. It also reviews source code and runs demo programs. Attendees learn to create interactive OpenGL programs that render animated, shaded objects in real time.

Prerequisites

Ability to read simple computer programs written in C.

Topics

Geometric rendering primitives and how they can be assembled into 3D objects. Matrix operations for virtual camera manipulation (viewing and projection transformations) and modeling transformations. Animation of objects and interactive program manipulation. Depth (z) buffering. Simulating lighting effects for geometric objects. Texture mapping of geometric objects and utilizing texture mapping for simple image manipulation. Anti-aliasing. Using the accumulation and stencil buffers for advanced rendering techniques. Image blending and simple image processing techniques.

Organizer

DAVE SHREINER
SGI

Lecturers

DAVE SHREINER
VICKI SHREINER
SGI

EDWARD ANGEL
University of New Mexico

Schedule

- | | |
|-------|---|
| 10 | Welcome and Introduction
SHREINER |
| 10:35 | OpenGL Overview and Rendering Basics
SHREINER |
| 11:30 | Projection, Viewing, and Modeling Transformations
ANGEL |
| noon | Lunch |
| 1:30 | Projection, Viewing, and Modeling Transformations - continued
ANGEL |
| 2:45 | Depth Buffering
SHREINER |
| 3 | Break |
| 3:15 | Lighting
SHREINER |
| 3:30 | Animation and User Interaction
SHREINER |
| 4 | Texture Mapping
ANGEL |
| 4:30 | Rendering Images and Image Processing
SHREINER |
| 5 | Advanced Topics
SHREINER |
| 5:45 | Conclusion and Questions
ALL |

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Papers & Panels

SIGGRAPH 2001 Papers: The premier international forum for the latest and most significant findings in computer graphics and interactive techniques. Papers are submitted for review by a committee of world-renowned experts in computer graphics. Each accepted paper is presented by the author(s) at SIGGRAPH 2001 and printed in the field's premier archive, the SIGGRAPH Conference Proceedings.

SIGGRAPH 2001 Panels: A highly interdisciplinary program that sparks animated discussions and provides thought-provoking insights from some of the top professionals in the interactive and graphics world.

After their presentations, authors and panelists move on to practical demonstrations in the Creative Applications Lab and informal discussions in the Technical Lounge.

Full Conference registration allows attendees access to all SIGGRAPH 2001 Papers and Panels. Seating is on a first-come, first-served basis. Please be sure to arrive early for the Papers and Panels you wish to attend.

Papers Chair

EUGENE FIUME
University of Toronto

Panels Chair

KATHRYN SAUNDERS
ThinkTech

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Pixar Animation Studios

MICHAEL F. COHEN
Microsoft Research

PAUL DEBEVEC
USC Institute for Creative
Technologies

TONY DEROSE
Pixar Animation Studios

MATHIEU DESBRUN
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and California Institute of Technology

JULIE DORSEY
Massachusetts Institute of Technology

JAMES D. FOLEY
Georgia Institute of Technology

HENRY FUCHS
University of North Carolina at
Chapel Hill

THOMAS FUNKHOUSER
Princeton University

STEVEN J. GORTLER
Harvard University

JOHN C. HART
University of Illinois at Urbana-
Champaign

WOLFGANG HEIDRICH
University of British Columbia

JOHN F. HUGHES
SIGGRAPH 2002 Papers Chair
Brown University

LEIF P. KOBELT
Rheinisch-Westfälische Technische
Hochschule Aachen (RWTH)

DAVID KURLANDER
Microsoft Corporation

GORDON KURTENBACH
Alias|Wavefront

HENRY MORETON
NVIDIA Corporation

GREGORY M. NIELSON
Arizona State University

DINESH K. PAI
University of British Columbia

HANSPETER PFISTER
Mitsubishi Electric Research
Laboratory

PRZEMYSŁAW PRUSINKIEWICZ
University of Calgary

HOLLY RUSHMEIER
IBM T.J. Watson Research Center

DAVID H. SALESIN
The University of Washington
and Microsoft Research

MARK SEGAL
ATI Technologies and San Jose
State University

STEVEN SEITZ
The University of Washington

PETER SHIRLEY
University of Utah

MEL SLATER
University College London

JOHN M. SNYDER
Microsoft Research

JOS STAM
Alias|Wavefront

GABRIEL TAUBIN
California Institute of Technology
and IBM Research

DEMETRI TERZOPOULOS
New York University and
University of Toronto

Papers Program Coordinator

VICKI CAULFIELD
Capstone Solutions, Inc.

Panels Jury

SARA DIAMOND
Banff Centre for the Arts

ISAAC KERLOW
The Walt Disney Company

BILL KROYER
Rhythm & Hues Studios

JILL SMOLIN
Cinesite

CHRISTOPHER DAVID SHAW
SIGGRAPH 2002 Panels Chair
Georgia Institute of Technology

Panels Committee

STEPHEN BOYD
NAPOLEON BROUSSEAU

Panels Administrative Assistant

ETTA DiLEO
The Write Approach

Location

See pages 46 - 55

Days & Hours

Wednesday, 15 August

10:30 am - 6 pm

Thursday, 16 August

8:30 am - 6 pm

Friday, 17 August

8:30 am - 6 pm

8 - 9:45 am

West Hall A

Keynote Address/Awards

The Big Picture

As technological change continues to deliver new marvels and new possibilities, it is easy to lose track of the larger perspective. Technological progress, in particular the evolution of computer graphics, can best be understood as part of the bigger story of the evolution of human intelligence and its relationship to the natural world.

DANNY HILLIS

Chairman and Chief Technology Officer,
Applied Minds, Inc. and Co-Chairman,
The Long Now Foundation

Immediately before the keynote address, ACM SIGGRAPH presents the Significant New Researcher Award to Paul E. Debevec, USC Institute for Creative Technologies; Computer Graphics Achievement Award to Andrew Witkin, Pixar Animation Studios; and the 2001 Steven Anson Coons Award for Outstanding Creative Contributions to Computer Graphics to Lance J. Williams, Walt Disney Feature Animation.

Areas of Interest

sfx Animation & Special Effects

a Art

g/it Game Development &
Interactive Techniques

vr Virtual Reality

w Web-related

10:30 am - 12:15 pm

West Hall A

Papers

Natural Animation

Chair

DEMETRI TERZOPOULOS

New York University and University of Toronto

• Visual Simulation of Smoke

RONALD FEDKIW

HENRIK WANN JENSEN

Stanford University

JOS STAM

Alias/Wavefront

Keywords

Computational Fluid Dynamics, Natural
Phenomena, Physically Based Animation,
Volume Rendering

• Practical Animation of Liquids

NICK FOSTER

PDI/DreamWorks

RONALD FEDKIW

Stanford University

Keywords

Animation, Computational Fluid Dynamics,
Implicit Surfaces, Natural Phenomena,
Physically Based Animation

• Dynamic Real-Time Deformations
Using Space & Time Adaptive
Sampling

GILLES DEBUNNE

MARIE-PAULE CANI

IMAGIS-GRAVIR

MATHIEU DESBRUN

University of Southern California

ALAN H. BARR

California Institute of Technology

Keywords

Animation, Deformations, Level of Detail
Algorithms, Physically Based Animation

• Optimization-Based Animation

VICTOR J. MILENKOVIC

HARALD SCHMIDL

University of Miami

Keywords

Animation, Animation With Constraints,
Physically Based Animation, Physically Based
Modeling, Scientific Visualization, Solid
Modeling

Petree Hall D

Papers

Volumetric and Graphing
Techniques*Chair*

JOHN C. HART

University of Illinois at Urbana-Champaign

• Kizamu: A System for Sculpting
Digital Characters

RONALD N. PERRY

SARAH F. FRISKEN

Mitsubishi Electric Research Laboratory

Keywords

Applications, Geometric Modeling, Graphics
Systems, Mesh Generation, Rendering,
Rendering Systems

• Feature-Sensitive Surface Extraction
From Volume Data

LEIF P. KOBBELT

MARIO BOTSCH

Rheinisch-Westfälische Technische

Hochschule Aachen

ULRICH SCHWANECKE

HANS-PETER SEIDEL

Max-Planck-Institut für Informatik

Keywords

CAD, Curves and Surfaces, Geometric
Modeling, Mesh Generation, Polygonal
Modeling, Solid Modeling

• Reconstruction and Representation of
3D Objects With Radial Basis
Functions

JONATHAN C. CARR

TIM J. MITCHELL

Applied Research Associates NZ Limited and

University of Canterbury

RICHARD K. BEATSON

University of Canterbury

JON B. CHERRIE

W. RICHARD FRIGHT

BRUCE C. MCCALLUM

TIM R. EVANS

Applied Research Associates NZ Limited

Keywords

Curves and Surfaces, Implicit Surfaces, Mesh
Generation, Range Images, Solid Modeling,
Weird Math

• Reliable Two-Dimensional Graphing
Methods for Mathematical Formulae
With Two Free Variables

JEFF TUPPER

University of Toronto

Keywords

Implicit Surfaces, Numerical Analysis,
Weird Math

10:30 am - 12:15 pm

West Hall B

Panel

sfx g/it

Video Game Play and Design: Procedural Directions

So far, game-play design has relied on traditional models, and it has been constrained by old hardware design. New consoles will support procedural simulation and a "drama-on-the-fly" that no other form of entertainment can achieve. For the developer, procedural simulation offers a lighter, more versatile library of assets. The payoff will be a new art form and a more cost-effective method of recreating intelligence, behavior, physics, and modeled environments. This panel presents a snapshot of the current state of procedural simulation and its potential.

Organizer

GEORGE SUHAYDA
Sony Picture Imageworks

Panelists

TOM HERSHEY, DOMINIC MALLINSON,
GEORGE SUHAYDA
Sony Picture Imageworks

JANET MURRAY
Georgia Institute of Technology

BILL SWARTOUT
USC Institute for Creative Technologies

Petree Hall C

Panel

a g/it vr w

Cultural Mediation in New Media Spaces



New forms of cultural mediation and participation arise in the convergence of Internet and real space. Current trends toward linking cultural archives, creating mixed-reality communication spaces, and "human-centered interaction" for knowledge discovery in networked environments are challenging many assumptions about cultural communication. This panel presents projects and artistic concepts that describe new forms of cultural practice based on advanced-media technology.

Organizer

GABRIELE BLOME
GMD National Research Center for Information Technology

Panelists

GABRIELE BLOME, MONIKA FLEISCHMANN,
WOLFGANG STRAUSS
GMD National Research Center for Information Technology

STEVE DIETZ
Walker Art Center

CHARLOTTE PÖCHHACKER
Artimage Inc.

PERTTU RASTAS
Kiasmas Museum of Contemporary Art

WARREN SACK
University of California, Berkeley

2:15 - 4 pm

West Hall A

Papers

Reality-Based Modeling

Chair

STEVEN SEITZ
The University of Washington

• Scanning Physical Interaction Behavior of 3D Objects

DINESH K. PAI
KEES VAN DEN DOEL
DOUG L. JAMES
JOCHEN LANG
JOHN E. LLOYD
JOSHUA L. RICHMOND
SOM H. YAU
University of British Columbia

Keywords

Behavioral Animation, Deformations, Haptics, Multimedia, Physically Based Modeling, Robotics, Sound Visualization

• Synthesizing Bidirectional Texture Functions for Real-World Surfaces

XINGUO LIU
HEUNG-YEUNG SHUM
Microsoft Research
YIZHOU YU
University of Illinois at Urbana-Champaign

Keywords

Image-Based Rendering, Reflectance and Shading Models, Texture Synthesis

• Image-Based Rendering of Diffuse, Specular and Glossy Surfaces From a Single Image

SAMUEL BOIVIN
ANDRÉ GAGALOWICZ
INRIA Rocquencourt

Keywords

Computer Vision, Illumination, Image-Based Rendering, Radiosity, Ray Tracing, Reflectance & Shading Models, Rendering

• A Signal-Processing Framework for Inverse Rendering

RAVI RAMAMOORTHY
PAT HANRAHAN
Stanford University

Keywords

Computer Vision, Illumination, Reflectance and Shading Models, Rendering, Signal Processing, Weird Math

Petree Hall C

Panel

g/it vr

Computer Games and Viz: If You Can't Beat Them, Join Them

Computer-game applications have rapidly become driving forces for major advances in computer graphics hardware and application programming interfaces. Game developers have made huge contributions to bringing high-end graphics technology to volume consumer platforms. Where does that leave developers of scientific and information visualization applications? How are the visual metaphors of game design influencing visualization paradigms? Will the computer-game industry provide the funding and research to improve graphics performance and price for the computer graphics field in general and visualization specifically?

Organizer

THERESA-MARIE RHYNE
North Carolina State University

Panelists

PETER K. DOENGES Evans & Sutherland	CHRIS HECKER definition six, inc.
WILLIAM HIBBARD University of Wisconsin-Madison	HANSPETER PFISTER Mitsubishi Electric Research Laboratory

THERESA-MARIE RHYNE
North Carolina State University

NATE ROBINS
Avalanche Software

Petree Hall D

Panel

sfx

Size Matters: Digital Cinema Distribution

Digital cinema is gaining momentum, becoming a more viable reality. This panel reviews remaining technical and logistical hurdles in making, distributing, and delivering digital film; subjective interpretation of image integrity; standardization formats; digital projection; storage and distribution processes; and how all these issues affect filmmakers, theater owners, and movie-goers.

Organizers

KAREN RAZ Raz Public Relations, LLC	GENEVIEVE YEE Past Chair, Los Angeles SIGGRAPH Chapter
--	---

Moderator

CHARLES POYNTON

Panelists

ALLEN DAVIAU Cinematographer, ASC	JOSHUA PINES Industrial Light + Magic
JAMES H. KORRIS University of Southern California	ALLEN WITTERS WAM!NET
BOB LAMBERT The Walt Disney Company	

4:15 - 6 pm

West Hall A

Papers

Hardware and Hardware Rendering

Chair

WOLFGANG HEIDRICH
University of British Columbia

- **WireGL: A Scalable Graphics System for Clusters**

GREG HUMPHREYS, MATTHEW ELDRIDGE
IAN BUCK, MATTHEW EVERETT
PAT HANRAHAN
Stanford University
GORDON STOLL
Intel Corporation

Keywords

Distributed Graphics, Graphics Systems,
Parallel Computing

- **Lightning-2: A High-Performance Display Subsystem for PC Clusters**

GORDON STOLL, DAN PATTERSON
ART WEBB, CHRIS CAYWOOD
MILTON TAVEIRA, STEPHEN HUNT
Intel Corporation
MATTHEW ELDRIDGE, PAT HANRAHAN
Stanford University
STEVEN BERMAN, RICHARD LEVY
Cornell University

Keywords

Graphics Hardware, Graphics Systems, Parallel
Computing, Rendering Hardware, Rendering
Systems

- **A User-Programmable Vertex Engine**

ERIK LINDHOLM, MARK J. KILGARD
HENRY MORETON
NVIDIA Corporation

Keywords

Graphics Hardware, Graphics Systems

- **A Real-Time Procedural Shading System for Programmable Graphics Hardware**

KEKOA PROUDFOOT, WILLIAM R. MARK
PAT HANRAHAN
Stanford University
SVETOSLAV TZVETKOV
NVIDIA Corporation

Keywords

Graphics Hardware, Graphics Systems,
Languages, Rendering

- **Homomorphic Factorization of BRDFs for High-Performance Rendering**

MICHAEL D. MCCOOL, JASON ANG
ANIS AHMAD
University of Waterloo

Keywords

Illumination, Numerical Analysis, Reflectance
and Shading Models, Rendering, Texture Mapping

Petree Hall C

Panel

sfx a

The Future of Color: Creativity and Technology

This panel explores the creative path of color and image representation in modern filmmaking. Presentations include traditional photo chemistry and digital paths from the artist to the audience. Practical 35mm examples demonstrate the technical differences and creative demands of the many different color representations, the limitations of current techniques, and technology and techniques to avoid those failures.

Organizer

JOSHUA KOLDEN
Independent Digital Effects Supervisor

Panelists

ROGER DEAKINS
Cinematographer
JOSHUA KOLDEN
Independent Digital Effects Supervisor
NEIL ROBINSON
Industrial Light + Magic
BEVERLY WOOD
Deluxe Laboratories

Petree Hall D

Panel

a vr w

Visualization, Semantics, and Aesthetics

If visualization makes data meaningful to humans, what role does aesthetics play in this process? There is pleasure in putting the unknown and the unknowable into language, and tension between the precision of code and the abstraction and manipulation of art making. Visualizations are powerful images, beautiful in their own right. Some evoke erotic delight, others a sense of awe. Where do the aesthetics of visualization intersect with current design and art making? This panel integrates computational linguistics, mathematics, software design, and art.

Organizer

SARA DIAMOND
The Banff Centre for the Arts

Panelists

SHEELAGH CARPENDALE
University of Calgary
SARA DIAMOND
The Banff Centre for the Arts
VICTORIA INTERRANTE
University of Minnesota
JASON LEWIS
Arts Alliance Laboratories
JOSHUA PORTWAY
Real World
DAVID SLESS
Communication Research Institute of Australia
SHA XIN-WEI
Georgia Institute of Technology

8:30 - 10:15 am

West Hall A

Papers

Meshes

Chair

GABRIEL TAUBIN
California Institute of Technology and
IBM Research

• Consistent Mesh Parameterizations

EMIL PRAUN
Princeton University

WIM SWELDENS
Lucent Technologies, Bell Labs

PETER SCHRÖDER
California Institute of Technology

Keywords

Curves and Surfaces, Mesh Generation,
Morphing, Shape Blending

• Approximate Boolean Operations on Free-Form Solids

DANIEL KRISTJANSSON
HENNING BIERMANN
DANIS ZORIN
New York University

Keywords

Computational Geometry, Curves and Surfaces,
Geometric Modeling, Level of Detail
Algorithms, Solid Modeling

• Progressive Compression for Lossless Transmission of Triangle Meshes

PIERRE ALLIEZ
MATHIEU DESBRUN
University of Southern California

Keywords

Compression Algorithms, Level of Detail
Algorithms, Polygonal Mesh Reduction

• Topology Matching for Fully Automatic Similarity Estimation of 3D Shapes

MASAKI HILAGA
YOSHIHISA SHINAGAWA
The University of Tokyo

TAKU KOHMURA
RIKEN (The Institute of Physical and
Chemical Research)

TOSHIYASU L. KUNII
Hosei University

Keywords

Computer Vision Shape Recognition

Petree Hall D

Papers

Measurement and Presentation

Chair

HOLLY RUSHMEIER
IBM T. J. Watson Research Center

• Measuring and Predicting Visual Fidelity

BENJAMIN WATSON
Northwestern University

ALINDA FRIEDMAN
AARON MCGAFFEY
University of Alberta

Keywords

Compression Algorithms, Human-Computer
Interface, Human Factors, Image Processing,
Level of Detail Algorithms, Polygonal Mesh
Reduction, Rendering

• Perception-Guided Global Illumination Solution for Animation Rendering

KAROL MYSZKOWSKI
TAKEHIRO TAWARA
HIROYUKI AKAMINE
HANS-PETER SEIDEL
Max-Planck-Institut für Informatik

Keywords

Animation, Human Factors, Illumination,
Monte Carlo Techniques, Temporal Aliasing

• Interactive Stereoscopic Display for Three or More Users

YOSHIFUMI KITAMURA
SUMIHIKO YAMAMOTO
FUMIO KISHINO
Osaka University

TAKASHIGE KONISHI
Toppan Printing Co., Ltd.

Keywords

Virtual Reality, Head-Mounted Displays

• Rendering Effective Route Maps: Improving Usability Through Generalization

MANEESH AGRAWALA
CHRIS STOLTE
Stanford University

Keywords

Human Factors, Information Visualization,
Non-Realistic Rendering, WWW Applications

West Hall B

Panel

g/it w

:-o A Conversation About Interactive Entertainment Experiences on Instant Messaging Devices

From mad texting that incites political revolutions to alien-fish swapping games, the usefulness, richness, and whimsy in the world of instant messaging is often lost on North American audiences. This panel demystifies (and reasserts) the fun everyone is having in Asia and Europe with their cell phones, cybikos, PDAs, and other devices that easily fit into a jean-jacket pocket. The audience joins the conversation via cell phone (WAP-enabled, of course) as the researcher, the technologist, the creator, and the users share their thoughts on meaningful or at least engaging interactive experiences on instant-messaging devices.

Organizer

ANA SERRANO
Bell h@bitat, Canadian Film Centre

Panelists

KIM BINSTED
i-Chara Inc.
TOM FREELAND
Cybiko, Inc.
ERIN LEMON
Digital 4Sight

ANA SERRANO
Bell h@bitat,
Canadian Film Centre
RALPH GUGGENHEIM
Electronic Arts

Petree Hall C

Panel

sfx

Non-Linear Animation for Production

Production studios, 3D animators, and vendors of many popular computer graphics packages, are increasingly using the term "non-linear animation" (NLA), which usually describes a way of working with various types of motion data at a higher level where animation sources are abstracted to transportable snippets. Non-linear tools can be useful in many areas of production, such as previsualization, animation creation, motion editing, retargeting and reuse, choreography, and actor direction. This panel discusses practical and speculative uses of NLA techniques in a production environment.

Organizer

GORDON CAMERON
Softimage

Panelists

RAF ANZOVIN
Anzovin Studio
MICHAEL ISNER
GORDON CAMERON
Softimage

LAURENT LAVIGNE
Pixel Liberation Front
GREG PUNCHATZ
Animation Inc.
SETH ROSENTHAL
Industrial Light + Magic

10:30 am - 12:15 pm

West Hall A

Papers

Animation and Expression

Chair

DINESH K. PAI
University of British Columbia

- **Composable Controllers for Physics-Based Character Animation**

PETROS FALOUTSOS
MICHEL VAN DE PANNE
University of Toronto
DEMETRI TERZOPOULOS
New York University and University of Toronto

Keywords

Animation, Physically Based Animation,
Physically Based Modeling, Robotics

- **Automating Gait Animation**

HAROLD C. SUN
DIMITRIS N. METAXAS
University of Pennsylvania

Keywords

Animation, Animation Systems, Human Body
Simulation

- **Expressive Expression Mapping With Ratio Images**

ZICHENG LIU
YING SHAN
ZHENGYOU ZHANG
Microsoft Research

Keywords

Animation, Facial Animation, Morphing

- **Expression Cloning**

JUN-YONG NOH
ULRICH NEUMANN
University of Southern California

Keywords

Deformations, Facial Animation, Morphing,
Neural Nets

Petree Hall D

Papers

Procedural Modeling

Chair

HENRY MORETON
NVIDIA Corporation

- **The Use of Positional Information in the Modeling of Plants**

PRZEMYSŁAW PRUSINKIEWICZ
LARS MÜENDERMANN
RADOSŁAW KARWOWSKI
BRENDAN LANE
University of Calgary

Keywords

Biological Modeling, Geometric Modeling,
L-Systems, Natural Phenomena

- **Procedural Modeling of Cities**

YOAV I. H. PARISH
PASCAL MÜLLER
Eidgenössische Technische Hochschule Zürich

Keywords

Geometric Modeling, L-Systems, Mesh
Generation, Physically Based Modeling,
Texture Synthesis

- **Feature-Based Cellular Texturing for Architectural Models**

JUSTIN LEGAKIS
JULIE DORSEY
Massachusetts Institute of Technology
STEVEN GORTLER
Harvard University

Keywords

Geometric Modeling, Texture Mapping,
Texture Synthesis

- **Integrating Shape and Pattern in Mammalian Models**

MARCELO WALTER
Universidade do Vale do Rio dos Sinos
ALAIN FOURNIER
University of British Columbia
DANIEL MENEVAUX
Laboratoire SIC

Keywords

Animation, Morphing, Natural Phenomena,
Texture Mapping, Texture Synthesis

West Hall B

Panel

sfx w

VIPs: Virtually Invented People

Building compelling, realistic virtual people is an intriguing, multidisciplinary, technical challenge. As we meet that challenge and move toward a generation of believable digital characters, novel forms of personal interaction and human-machine communication will become routine. This panel examines the next generation of lifelike virtual humans and discusses the social, entertainment, psychological, and theological puzzles that they present.

Organizer

KATHRYN SAUNDERS
ThinkTech

Panelists

ANDREW BURGESS
Ananova

BARBARA HAYES-ROTH
Extempo Systems, Inc.

R.U. SIRIUS
Alternating Currents

THOMAS VETTER
Universität Freiburg

KEITH WATERS
LifeFX Networks, Inc.

Petree Hall C

Panel

a vr w

The CAVE and Beyond: VR Art in Museums and Galleries

Immersive, interactive VR systems (CAVEs, Domes, etc.) deliver unique artistic, entertainment, and educational experiences. Yet only a handful of such systems are regularly open to the public. This panel reviews the aesthetic, economic, technological, and logistics successes and problems of current VR installation practice. And it examines research that could alleviate the problems and reveal the future of immersive VR.

Organizer

JOSEPHINE ANSTEY
University at Buffalo

Panelists

DONNA COX
National Center for Supercomputing Applications

HORST HÖRTNER
Ars Electronica Futurelab

DANIEL J. SANDIN
University of Illinois at Chicago

PAUL SERMON
University of Salford

JEFFREY SHAW
Zentrum für Kunst und Medientechnologie

2:15 - 4 pm

West Hall A

Papers

Images and Textures

Chair

PRZEMYSŁAW PRUSINKIEWICZ
University of Calgary

• Image Analogies

AARON HERTZMANN
New York University and Microsoft Research

CHARLES E. JACOBS
NURIA OLIVER
Microsoft Research

BRIAN CURLESS
University of Washington

DAVID H. SALESIN
University of Washington and
Microsoft Research

Keywords

Image Processing, Image-Based Rendering,
Non-Realistic Rendering, Paint Systems,
Texture Synthesis

• Image Quilting for Texture Synthesis and Transfer

ALEXEI A. EFROS
University of California, Berkeley

WILLIAM T. FREEMAN
Mitsubishi Electric Research Laboratory

Keywords

Image-Based Rendering, Texture Mapping,
Texture Synthesis

• Texture Synthesis on Surfaces

GREG TURK
Georgia Institute of Technology

Keywords

Texture Mapping, Texture Synthesis

• Texture Synthesis Over Arbitrary Manifold Surfaces

LI-YI WEI
MARC LEVOY
Stanford University

Keywords

Curves and Surfaces, Texture Mapping,
Texture Synthesis

West Hall B

Panel

sfx a

Traditional Skills, New Tools

As the computer graphics universe expands, the tools we use frequently overshadow the skills we need to do our work. This panel of experts investigates just what it takes, in very real terms, to serve art and technology in today's industry.

Organizer

JILL SMOLIN
Cinesite

Moderator

TOM SITO
University of Southern California

Panelists

DEREK CHAN
DreamWorks SKG

IVO HORVAT
SANDE SCOREDOS
Sony Pictures Imageworks

STEVE MARKOWSKI
Cinesite

Petree Hall C

Panel

g/it vr

Designing, Understanding, and Operating Complex Human-Machine Systems

Many computer-based systems are vastly more complex than the wireless information appliances that are currently attracting so much attention. Some of these systems, such as air traffic control, commercial and military aircraft, commercial shipping, municipal rapid-transit networks, regional power plants, and oil and natural gas pipelines, are important components of the global economy and daily human existence. This panel considers human interaction with complex, automated systems; describes applications of appropriate technologies for those interactions; and explores challenging research issues.

Organizer

DAVID ZELTZER
Fraunhofer Center for Research in
Computer Graphics (CRCG)

Panelists

BILL BUXTON
Alias|Wavefront

STEVE CHIEN
Jet Propulsion Laboratory

CHRISTOPHER A. MILLER
SMArt Information Flow Technologies

ROBERT J. MOLLOY
National Transportation Safety Board

DAVID ZELTZER
Fraunhofer Center for Research on
Computer Graphics

Petree Hall D

Panel

w

Beyond Copyright: The Brave New World of Digital Rights Management

As more intellectual property becomes widely available in digital formats, the world is increasingly concerned about how to protect text, music, and images against unauthorized use, and about the sometimes conflicting rights of creators and users. Issues surrounding the use of MP3, the Secure Digital Music Initiative, and the DVD Content Scrambling System are widely debated in the technical, business, and popular media. This panel presents all sides of the issues and speculation about how they might be resolved.

Organizer

ROBERT ELLIS
ACM SIGGRAPH Public Policy
Program Chair

Panelists

DAN L. BURK
University of Minnesota

ROBERT ELLIS
ACM SIGGRAPH Public Policy
Program Chair

DEBORAH NEVILLE
Manatt Phelps and Philips

BARBARA SIMONS
ACM Past President and USACM
(ACM U.S. Public Policy Committee) Co-Chair

SARAH STEIN
North Carolina State University

4:15 - 6 pm

West Hall A

Papers

Point-Based Rendering and Shadows

Chair

HANSPETER PFISTER
Mitsubishi Electric Research Laboratory

- **The Randomized z-Buffer Algorithm: Interactive Rendering of Highly Complex Scenes**

MICHAEL WAND
INGMAR PETER
WOLFGANG STRABER
Universität Tübingen

MATTHIAS FISCHER
FRIEDHELM MEYER AUF DER HEIDE
Universität Paderborn

Keywords

Level of Detail Algorithms, Monte Carlo Techniques, Rendering Systems

- **Surface Splatting**

MATTHIAS ZWICKER
MARKUS GROSS
Eidgenössische Technische Hochschule Zürich
HANSPETER PFISTER
JEROEN VAN BAAR
Mitsubishi Electric Research Laboratory

Keywords

Antialiasing, Frame Buffer Algorithms, Image-Based Rendering, Rendering Systems, Texture Mapping

- **Spectral Processing of Point-Sampled Geometry**

MARK PAULY
MARKUS GROSS
Eidgenössische Technische Hochschule Zürich

Keywords

Geometric Modeling, Signal Processing

- **Adaptive Shadow Maps**

RANDIMA FERNANDO
SEBASTIAN FERNANDEZ
KAVITA BALA
DONALD P. GREENBERG
Cornell University

Keywords

Rendering, Shadow Algorithms

Petree Hall C

Panel

sfx

Newton's Nightmare: Reality Meets Faux Physics

Reality: Who needs it? Is computer graphics about building more and more accurate simulations of the real world, down to the last photon? Is computer graphics really hard physics dressed in Hollywood clothing? Or is reality, like, sooooo old fashioned? Is computer graphics now free from its shackles? Free to create non-whatever-realistic experiences? Free to write its own laws, with no reference to "reality?" This panel sheds some light (real or imagined) on these complex questions.

Organizer

DINESH K. PAI
University of British Columbia

Panelists

DINESH K. PAI
University of British Columbia

DOUG ROBLE
Digital Domain

HOLLY RUSHMEIER
IBM T. J. Watson Research Center

RICHARD SZELISKI
Microsoft Research

DEMETRI TERZOPOULOS
New York University and University of Toronto

Petree Hall D

Panel

vr

Immersed in Anxiety or a Process to Healing? VR Meets Mental Health

Virtual reality is becoming a viable tool for cognitive and behavioral mental health applications. Much like an aircraft simulator tests and trains piloting ability under a variety of controlled conditions, virtual environments can present simulations and stimulus inputs that can be used to treat human behavioral and cognitive processes. This panel presents eight top VR and mental health scientists who use VR to assess and treat phobias, post-traumatic stress disorder, burn and cancer pain, traumatic brain injury, attention deficit and hyperactivity disorder, learning disabilities, and assessment of cognitive/functional abilities with aging populations. One panelist will assume a "devils advocate" role and challenge the other panelists on the issues, and how technology can be advanced in a rational manner.

Organizer

ALBERT "SKIP" RIZZO
University of Southern California

Panelists

LARRY F. HODGES
Georgia Institute of Technology

HUNTER HOFFMAN
University of Washington

ALBERT "SKIP" RIZZO
University of Southern California

MARIA T. SCHULTHEIS
Kessler Medical Rehabilitation Research and Education Corp.

DOROTHY STRICKLAND
North Carolina State University and Virtual Reality Aids, Inc.

BENJAMIN WATSON
Northwestern University

BRENDA K. WIEDERHOLD
VRHealth.com

MARK WIEDERHOLD
Cyber Psychology & Behavior Journal

8:30 - 10:15 am

Petree Hall C

Papers

Illumination & Textures

Chair

MATHIEU DESBRUN
University of Southern California and California
Institute of Technology

- **Photo-Realistic Rendering of Knitwear Using the Lumislice**

YING-QING XU
YANYUN CHEN
STEPHEN LIN
HUA ZHONG
ENHUA WU
BAINING GUO
HEUNG-YEUNG SHUM
Microsoft Research China

Keywords

Hair Modeling, Illumination, Image-Based
Rendering, Natural Phenomena, Rendering,
Shadow Algorithms, Volume Rendering

- **A Physically-Based Night Sky Model**

HENRIK WANN JENSEN
Stanford University
MICHAEL M. STARK
SIMON PREMOŽE
PETER SHIRLEY
University of Utah

FRÉDO DURAND
JULIE DORSEY
Massachusetts Institute of Technology

Keywords

Atmospheric Effects, Illumination, Monte Carlo
Techniques, Ray Tracing, Rendering

- **Texture Mapping Progressive Meshes**

PEDRO V. SANDER
STEVEN J. GORTLER
Harvard University
JOHN SNYDER
HUGUES HOPPE
Microsoft Research

Keywords

Level of Detail Algorithms, Polygonal Mesh
Reduction, Texture Mapping

- **Constrained Texture Mapping for Polygonal Meshes**

BRUNO LÉVY
INRIA Loria

Keywords

Paint Systems, Polygonal Modeling,
Texture Mapping

10:30 am - 12:15 pm

West Hall A

Papers

Image-Based Modeling and
Rendering*Chair*

PAUL DEBEVEC
USC Institute for Creative Technologies

- **Unstructured Lumigraph Rendering**

CHRIS BUEHLER
MICHAEL BOSSE
LEONARD McMILLAN
Massachusetts Institute of Technology

STEVEN J. GORTLER
Harvard University

MICHAEL F. COHEN
Microsoft Research

Keywords

Image-Based Rendering

- **Image-Based Modeling and Photo Editing**

BYONG MOK OH
MAX CHEN
JULIE DORSEY
FRÉDO DURAND
Massachusetts Institute of Technology

Keywords

Image-Based Rendering, Paint Systems,
Range Images

- **Plenoptic Stitching: A Scalable Method for Reconstructing 3D Interactive Walkthroughs**

DANIEL G. ALIAGA
INGRID CARLBOM
Lucent Technologies, Bell Labs

Keywords

Computer Vision, Image Processing,
Image-Based Rendering, Rendering

- **Hybrid Stereo Camera: An IBR Approach for Synthesis of Very High Resolution Stereoscopic Image Sequences**

HARPREET S. SAWHNEY
YANLIN GUO
KEITH HANNA
RAKESH KUMAR
Sarnoff Corporation

SEAN ADKINS
SAMUEL ZHOU
IMAX Corporation

Keywords

Applications, Computer Vision,
Image Processing, Image-Based Rendering

Petree Hall C

Papers

Hands and Words:

Chair

DAVID KURLANDER
Microsoft Corporation

- **DAB: Interactive Haptic Painting With 3D Virtual Brushes**

BILL BAXTER
VINCENT SCHEIB
MING C. LIN
DINESH MANOCHA
University of North Carolina at Chapel Hill

Keywords

Applications, Human-Computer Interface,
Haptics, Paint Systems

- **Project FEELEX: Adding Haptic Surface to Graphics**

HIROO IWATA
HIROAKI YANO
FUMITAKA NAKAIZUMI
RYO KAWAMURA
University of Tsukuba

Keywords

Human-Computer Interface, Haptics,
Hardware Systems, User Interface Design,
Virtual Reality, Head-Mounted Displays

- **BEAT: The Behavior Expression Animation Toolkit**

JUSTINE CASSELL
HANNES VILHJALMSSON
TIM BICKMORE
Massachusetts Institute of Technology

Keywords

Animation Systems, Facial Animation,
Speech Synthesis

- **WordsEye: An Automatic Text-to-Scene Conversion System**

BOB COYNE
RICHARD SPROAT
AT&T Labs

Keywords

Applications, Human-Computer Interface,
Multimedia

10:30 am - 12:15 pm

West Hall B

Panel

a g/it w

Game-Stories:  
 Simulation, Narrative, Addiction
 When they discuss the future of entertainment and art, people often talk about a media form “between a game and a story.” In this exploration of whether game-stories already exist, panelists explain their positions and show examples of games created by others or themselves: board games, video games, spectator sports, digital art, children's games, language games, war games, card games, and more.

Organizer

NOAH WARDRIP-FRUIIN
 New York University

Panelists

J. C. HERTZ
 Joystick Nation Inc.
 HENRY JENKINS
 Massachusetts Institute of Technology
 JANET H. MURRAY
 Georgia Institute of Technology
 CELIA PEARCE
 University of Southern California
 KEN PERLIN
 NOAH WARDRIP-FRUIIN
 New York University
 ERIC ZIMMERMAN
 gameLab

Petree Hall D

Panel

w

**Internet Appliances:
New Horizons for the Web**

Forecasts indicate that by 2004 there will be more Internet-connected devices and appliances (handheld untethered devices, connected consumer electronics products, and even connected kitchen appliances, such as refrigerators) than there are connected computers. This panel reviews graphics-industry opportunities in this emerging field and demonstrates some state-of-the art Internet appliances.

Organizer

MICKEY W. MANTLE
 Gracenote (formerly CDDDB)

Panelists

GREGORY D. ABOWD
 Georgia Institute of Technology
 SEAMUS BLACKLEY
 Microsoft Corporation
 KENT LIBBEY
 Excite@Home
 ANDREW LUAN
 MetriCom, Inc.
 MICKEY W. MANTLE
 Gracenote (formerly CDDDB)

2:15 - 4 pm

West Hall A

Papers

The Interaction of Light and Matter*Chair*

JAMES ARVO
 California Institute of Technology

- **An Efficient Representation for** **Irradiance Environment Maps**

RAVI RAMAMOORTHY
 PAT HANRAHAN
 Stanford University

Keywords

Graphics Hardware, Illumination, Reflectance and Shading Models, Rendering

- **Applying Appearance Standards to Light Reflection Models**

HAROLD B. WESTLUND
 GARY W. MEYER
 University of Oregon

Keywords

Color, Optics, Reflectance and Shading Models, Rendering

- **A Practical Model for Subsurface Light Transport**

HENRIK WANN JENSEN
 STEPHEN R. MARSCHNER
 MARC LEVOY
 PAT HANRAHAN
 Stanford University

Keywords

Illumination, Monte Carlo Techniques, Ray Tracing, Reflectance and Shading Models, Rendering

- **Polynomial Texture Maps**

TOM MALZBENDER
 DAN GELB
 HANS WOLTERS
 Hewlett-Packard Laboratories

Keywords

Graphics Hardware, Illumination, Image Processing, Image-Based Rendering, Reflectance and Shading Models, Texture Mapping

Areas of Interest

 Animation & Special Effects

 Art

 Game Development &
 Interactive Techniques

 Virtual Reality

 Web-related

2:15 - 4 pm

Petree Hall C

Papers

Sound Simulation and Animation

Chair

THOMAS FUNKHOUSER
Princeton University

- **Synthesizing Sounds From Physically Based Motion**

JAMES F. O'BRIEN
University of California, Berkeley
PERRY R. COOK
GEORG ESSL
Princeton University

Keywords

Animation, Deformations, Multimedia,
Physically Based Animation, Physically Based
Modeling, Spatialized Sound, Weird Math

- **FOLEYAUTOMATIC: Physically-Based Sound Effects for Interactive Simulation and Animation**

KEES VAN DEN DOEL
PAUL G. KRY
DINESH K. PAI
University of British Columbia

Keywords

Animation Systems, Computer Games,
Multimedia, Physically Based Modeling, Sound
Visualization, Virtual Reality, Head-Mounted
Displays

- **Modeling Acoustics in Virtual Environments Using the Uniform Theory of Diffraction**

NICOLAS TSINGOS
INGRID CARLBOM
Lucent Technologies, Bell Labs
THOMAS FUNKHOUSER
ADDY NGAN
Princeton University

Keywords

Multimedia, Sound Visualization,
Spatialized Sound

- **An Immersive, Multi-User, Musical Stage Environment**

MATTHEW REYNOLDS
BERND SCHONER
JOEY RICHARDS
KELLY DOBSON
NEIL GERSHENFELD
Massachusetts Institute of Technology

Keywords

Applications, Human-Computer Interface,
Object Tracking, Spatialized Sound, User
Interface Design

West Hall B

Panel

a

Art in Space: What For?

We are about to encounter an emerging art form: space art. Space Art is about people from different worlds working together. It is about the convergence of technology with our biological carbon-based forms. It is about finding terrestrial intelligence on earth as well as outside of our own orbit. Should artists be working in the space program?

Organizer

LORELEI LISOWSKY
Zero-g Arts Lab

Panelists

TED KRUEGER
University of Arkansas

LORELEI LISOWSKY
Zero-g Arts Lab

MARCO PELJHAN
Projekt Atol

DEBRA A. SOLOMAN
Artist Astronaut Project

4:15 - 6 pm

West Hall A

Papers

Images and Image-Based Techniques

Chair

BRIAN A. BARSKY
University of California, Berkeley

- **Image-Based Motion Blur for Stop Motion Animation**

GABRIEL J. BROSTOW
IRFAN ESSA
Georgia Institute of Technology

Keywords

Animation, Applications, Computer Vision,
Image Processing, Image-Based Rendering,
Object Tracking, Video

- **A Simple and Efficient Error-Diffusion Algorithm**

VICTOR OSTROMOUKHOV
Université de Montréal

Keywords

Halftoning and Dithering

- **Simulating Decorative Mosaics**

ALEJO HAUSNER
University of Toronto

Keywords

Computational Geometry, Frame Buffer
Algorithms, Non-Realistic Rendering, Paint
Systems, Scientific Visualization

- **Real-Time Hatching**

EMIL PRAUN
MATTHEW WEBB
ADAM FINKELSTEIN
Princeton University

HUGUES HOPPE
Microsoft Research

Keywords

Animation Systems, Frame Buffer Algorithms,
Non-Realistic Rendering, Texture Mapping

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DAVID ZELTZER
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Sketches & Applications

Short, informal presentations on advanced research, artistic adventures, next year's technologies, production breakthroughs, and non-idle speculation. Presenters preview emerging work from the technical, education, medical, arts, design, gaming, performing arts, and entertainment communities.

Topics range from geology to character animation, psychology, hardware acceleration, traffic patterns, puppetry, and beyond.

Chair

DENA SLOTHOWER
Stanford University

Committee

JONATHAN GIBBS
PDI/DreamWorks

DOUG ROBLE
SIGGRAPH 2002 Sketches &
Applications Chair
Digital Domain

CHERYL STOCKTON
Studio Firefly/Pratt Institute

GARY TEMPLET
Sandia National Laboratories

Jury

SIMON ALLARDICE
Lynda.com

ED ANGEL
University of New Mexico

CHRIS BAILEY
Independent

RONEN BARZEL
Pixar Animation Studios

HISHAM BIZRI
Massachusetts Institute of
Technology

DAVID "GRUE" DEBRY
Industrial Light + Magic

RANDY FRANK
Lawrence Livermore National
Laboratory

DARIN GRANT
Digital Domain

MARC KESSLER
University of Michigan

JACQUELYN MARTINO
Philips Research, USA

MAUREEN NAPPI
New York University

KATHY NEELY
Fashion Institute of Technology

CARY PHILLIPS
Industrial Light + Magic

GARY PIMENTEL
Evans & Sutherland

Program Coordinator

VICKI CAULFIELD
Capstone Solutions, Inc.

Location

**Rooms 403, 404, 406, 408
and West Hall A**

Days & Hours

Wednesday, 15 August
10:30 am - 6 pm

Thursday, 16 August
8:30 am - 6 pm

Friday, 17 August
8:30 am - 4 pm

Areas of Interest

sfx Animation & Special Effects

a Art

g/it Game Development &
Interactive Techniques

vr Virtual Reality

w Web-related

10:30 am - 12:15 pm

Room 403

sfx

Animation Techniques

Session Chair

DENA SLOTHOWER
Stanford University

Human Motion Signatures for Character Animation

M. ALEX O. VASILESCU

University of Toronto
Department of Computer Science
10 Kings College Road
Toronto, Ontario M5S 3G4
CANADA

Separation of human motion data into elemental components, including a "motion signature" that reflects an individual's distinctive movement pattern, and novel recombination for graphical character animation.

Decomposing Animation Into BlendShapes

J.P. LEWIS

OHP
501 Glenoaks Boulevard, Suite 656
Glendale, California 91202
USA

Mathematical considerations for a system that decomposes data such as performance capture into editable localized blendshapes.

The Animator-Oriented Motion Generator, Animanium, Based on a Humanoid Robots-Control Algorithm

HIROTAKA IMAGAWA

SEGA Corporation
1-2-12, Haneda, Ohta-ku
Tokyo 144-8531 JAPAN
imosan@soj.sega.co.jp

New software that provides a useful and comprehensive environment for editing and generating motion of human characters.

WEDNESDAY, 15 AUGUST

10:30 am - 12:15 pm

Room 404

Human Factors

Session Chair

JACQUELYN MARTINO
Philips Research, USA

CAE

RitSens – Computer-Aided System for Studying Rhythmic Abilities in Bimanual Coordination

ARTEMIS MORONI

Instituto Nacional de Tecnologia da Informação
Rod. D. Pedro
I, km 143,6
Campinas 13089-500 BRAZIL
Artemis.Moroni@iti.br

RitSens, an application specially designed for investigation of rhythmic abilities in bimanual coordination, features a transparent tablet that operates with two pointers, one for each hand.

VR

Simulation Fidelity Metrics for Virtual Environments Based on Memory Semantics

KATERINA MANIA

University of Sussex
School of Engineering and Information Technology
Falmer, Brighton BN1 9RH
UNITED KINGDOM
k.mania@sussex.ac.uk

A methodology for assessment of simulation fidelity in immersive virtual environments, centered on a validated theory of memory awareness states.

Real vs. Approximate Collisions: When Can We Tell the Difference?

CAROL O'SULLIVAN

Image Synthesis Group
Trinity College
Dublin, IRELAND
Carol.OSullivan@cs.tcd.ie

Psychophysical experiments were conducted to examine the effects of factors such as eccentricity, separation, distractors, causality, and physics on collision perception. The results are used to guide perceptually adaptive collision handling.

VR

Solving a 3D Cube Puzzle in a Collaborative Virtual Environment: As Good as Really Being There Together?

ANTHONY STEED

University College London
Department of Computer Science
Gower Street
London WC1E 6BT
UNITED KINGDOM
A.Steed@cs.ucl.ac.uk

This comparison of performance and collaboration in situations where participants experience differing levels of immersion finds that collaboration is much easier between spatially immersive systems.

10:30 am - 12:15 pm

Room 406

Human Capture

Session Chair

KATHY NEELY

Fashion Institute of Technology

Analysis and Simulation of Facial Movements in Elicited and Posed Expressions Using a High-Speed Camera

TATSUO YOTSUKURA

ATR Media Integration & Communications Research Laboratories and Seikei University
2-2-2 Hikaridai, Seika-cho, Soraku-gun
Kyoto 619-0288 JAPAN
yotsu@mic.ATR.co.jp

A study of the dynamic aspects of posed facial expressions versus elicited emotional facial expressions.

Multi-Modal Translation System by Using Automatic Facial Image Tracking and Model-Based Lip Synchronization

SHIN OGATA

Seikei University
ATR SLT,
3-3-1 Kita-machi Kichijoji Musashino
Tokyo 180-8633 JAPAN
shin@ee.seikei.ac.jp

A multi-modal English-to-Japanese and Japanese-to-English translation system that also translates the speaker's speech motion and synchronizes it to the translated speech.

Model-Based Analysis and Synthesis of Human Body Images

JUNICHI HOSHINO

College of Engineering Systems
University of Tsukuba
1-1-1 Tennoudai
Tsukuba 305-8573 JAPAN
jhoshino@esys.tsukuba.ac.jp

A new method for building digital actors by generating texture-mapped 3D human models from video.

WEDNESDAY, 15 AUGUST

61

10:30 am - 12:15 pm

Room 408

Shading

Session Chair

RONEN BARZEL

Pixar Animation Studios

Anti-Aliasing Perlin Noise

IAN STEPHENSON

National Centre for Computer Animation
Bournemouth University
Talbot Campus
Poole, Dorset BH12 5BB
UNITED KINGDOM
istephen@bournemouth.ac.uk

Perlin noise is a key function in writing procedural shaders, but it is prone to aliasing. Integrating it can dramatically reduce artifacts.

Flow Noise

KEN PERLIN

New York University Media Research Lab
719 Broadway, 12th Floor
New York, New York 10003
USA
perlin@mrl.nyu.edu

Enhanced Perlin noise (rotating gradients so animated textures flow better) and using pseudo-advection to improve noise turbulence is improved by pseudo-advection. Results are flexible, efficient, and attractive. Examples include: flowing water, fire, clouds, smoke, and lava.

Organic Textures With Controlled Anisotropy and Directionality

KAZUNORI MIYATA

Department of Media Art
Tokyo Institute of Polytechnics
1583 Iiyama, Atsugi-shi
Kanagawa 243-0297 JAPAN
miyata@acm.org

A method of generating organic textures that first tessellates a region into a set of polygons and then generates detailed geometry for each of them.

Implementing Vector-Based Texturing in RenderMan

JOHN HADDON

National Centre for Computer Animation
Bournemouth University
Talbot Campus
Poole, Dorset BH12 5BB
UNITED KINGDOM
theboyhaddon@hotmail.com

2D vector graphics provide high resolution, low memory requirements, and scalable images, and they can be adaptively rasterized at suitable resolutions to texture 3D objects in RenderMan.

Shadermaps: A Method For Accelerating Procedural Shading

THOMAS R. JONES

MERL
201 Broadway Street,
8th Floor
Cambridge, Massachusetts
02139 USA
jones@merl.com

Shadermaps are a new method for accelerating procedural shading, driven by the observation that the visual complexity of most objects is due to their static surface appearance.

2:15 - 4 pm

Room 403

sfx

Fun for TDs

Session Chair

DARIN GRANT

Digital Domain

High-Dynamic-Range
Photography, Global
Illumination, and Mental
Ray on a Commercial
Budget and Timeline

BRIAN GOLDBERG

Digital Domain
300 Rose Avenue
Venice, California 90291 USA
bgold@d2.com

A detailed look into application of image-based lighting techniques and new features in rendering technology in a high-profile commercial.

Rendering "Pepe" With
Global Illumination

MARCOS FAJARDO

USC Institute for Creative
Technologies
13274 Fiji Way, 5th Floor
Marina del Rey, California
90292 USA
fajardo@ict.usc.edu

Using a custom Monte Carlo global illumination renderer for an animated short subject starring Daniel Martinez Lara's "Pepe" digital puppet.

Linux for the
Production Pipeline

JEFFREY WIKE

DreamWorks Feature Animation
1000 Flower Street
Glendale, California 91201 USA
jwike@anim.dreamworks.com

DreamWorks retooled its entire animation production facilities from high-end proprietary workstations to commodity-based Intel/Linux solutions. The result: dramatic increases in performance and significantly reduced costs.

Creating Tools for Playstation2
Game Development

KEVIN ROSE

Sony Computer Entertainment
Europe - Cambridge
Quern House, Mill Court
Great Shelford
Cambridge CB2 5LD
UNITED KINGDOM
kevin_rose@scee.sony.cp.uk

Key challenges encountered in creating a level editor, miscellaneous art tools, and data pipelines for a PS2 title.

2:15 - 4 pm

Room 404

Numerical Techniques

Session Chair

MARC KESSLER

University of Michigan

Elastic Object Manipulation
Using Coarse-to-Fine
Representation of Mass-
Spring Models

HIROFUMI KAWAI

Nara Institute of Science and
Technology
8916-5 Takayama-cho
Ikoma-shi, Nara 630-0101 JAPAN
hirofu-k@is.aist-nara.ac.jp

An efficient method for elastic object deformation using mass-spring models with coarse-to-fine representation based on the degree of deformation.

A New Method For
Numerical Constrained
Optimization

RONALD N. PERRY

Mitsubishi Electric Research
Laboratories
201 Broadway Street, 8th Floor
Cambridge, Massachusetts
02139 USA
perry@merl.com

Constrained optimization is an important tool with extensive applications in computer graphics. This new method for constraint handling significantly improves an algorithm's ability to navigate constrained space.

Variational Classification
for Visualization of 3D
Ultrasound Data

DANI LISCHINSKI

School of Computer Science
and Engineering
The Hebrew University
Givat Ram
Jerusalem 91904 ISRAEL
danix@cs.huji.ac.il

A new technique for high-fidelity interactive visualization of surfaces from fuzzy and noisy 3D ultrasound data using a novel opacity classification algorithm based on the variational principle.

2:15 - 4 pm

Room 406

Displays

*Session Chair*JACQUELYN MARTINO
Philips Research, USA

Lighting-Sensitive Displays

SHREE K. NAYAR

Columbia University
1214 Amsterdam Avenue,
M.C. 0401
Department of Computer Science
New York, New York 10027 USA
nayar@cs.columbia.edu

New technologies that enable a display device to sense illumination in its environment and render the appearance of its content accordingly.



Using Color-Changing Textiles as a Computer Graphics Display

LARS ERIK HOLMQUIST

PLAY, Interactive Institute
Box 620
Göteborg SE-405 30 SWEDEN
leh@viktorja.org

Using photochromically treated threads to create a fabric that changes color when subjected to ultraviolet light. In conjunction with a computer-controlled lamp, the textile becomes a dynamic display.

ELMO: A Head-Mounted Display for Real-Time Image Synthesis

KIYOSHI KIYOKAWA

Communications Research Laboratory
Nukui-Kitamachi
Koganei
Tokyo 184-8795 JAPAN
kiyo@crl.go.jp

An optical see-through head-mounted display that uses a real-time range finder and a light-blocking mechanism to present mixed-reality environments with correct mutual occlusion in any environment.

2:15 - 4 pm

Room 408

Modeling Interfaces

*Session Chair*GARY TEMPLET
Sandia National Laboratories

A Suggestive Interface for 3D Drawing

TAKEO IGARASHI

Computer Science Department
Brown University
115 Waterman Street
Providence, Rhode Island
02912 USA
takeo@acm.org

An interaction technique for 3D drawing in which the user highlights geometric components in the scene as hints, and the system suggests possible operations based on the hints.

French Surface: A New Technique for Surface Design

ZITA CHENG

Human Communications
Technology Laboratory
Department of Electrical and
Computer Engineering
2356 Main Mall
University of British Columbia
Vancouver, British Columbia
V6T 1Z4 CANADA
zitast@math.ubc.ca

Inspired by drafters' French curves, French Surface provides users with a predefined set of surfaces as drawing templates. This avoids the mathematical structure and freehand control of traditional methods.

An Interactive System for Robust Topological Modeling of Meshes

ERGUN AKLEMAN

Texas A&M University
Visualization Laboratory
216 Langford Center
College Station, Texas 77843
USA
ergun@viz.tamu.edu

An interactive system for robust modeling of orientable two-manifold polygonal meshes.

Simultaneous Model Assembly in Real and Virtual Spaces

ECKHARD MEIER

GMD - German National Research
Center for Information Technology
Schloss Birlinghoven
Sankt Augustin 53754
GERMANY
eckhard.meier@gmd.de

Using building blocks to create models in physical and virtual space simultaneously. The system reproduces assembly of physical models in real time.

4:15 - 6 pm

Room 403

sfx

Merging 2D and 3D Production Methods

Session Chair

CARY PHILLIPS

Industrial Light + Magic

How Changes in Technology Change the Use of Computer Animation at Walt Disney Feature Animation

STEVE GOLDBERG

Walt Disney Feature Animation
500 South Buena Vista Street
Burbank, California 91521 USA
steve.goldberg@disney.com

Advances in software and hardware and how they have influenced both corporate aesthetics and artists' attitudes about computer animation.

Bringing PhotoRealism to Fantasy: The Hybrid Approach of a Digital Matte Artist

PAUL HUSTON

Industrial Light + Magic
3155 Kerner Boulevard
San Rafael, California 94901 USA
paul@ilm.com

Evolution and advances in digital matte techniques demonstrated through films such as "Star Wars Special Edition, Episode I: The Phantom Menace," "Mission: Impossible," "Space Cowboys," and "The Mummy Returns."

Digital Tricks for Japanese Cel Animation

AKIO KAZUMI

OLM Digital, Inc.
2-29-7 Sangenjaya
Setagaya-ku
Tokyo 154-0024 JAPAN
kazumi@olm.co.jp

How digital tricks are created and applied in making Japanese cel animation, including practical examples from the Pokemon movies.

WEDNESDAY, 15 AUGUST

4:15 - 6 pm

Room 404

Curves and Morphing

Session Chair

MARC KESSLER

University of Michigan

2D Shape Interpolation Using A Hierarchical Approach

HENRY JOHAN

University of Tokyo
7-3-1 Hongo Bunkyo-ku
Tokyo 113-0033 JAPAN
henry@is.s.u-tokyo.ac.jp

In this solution to the shape interpolation problem, the algorithm constructs compatible hierarchical representations of two given shapes. Interpolating the compatible hierarchical representations generates smooth interpolation sequences.

Fair and Robust Curve Interpolation on the Sphere

CARLO H. SÉQUIN

University of California, Berkeley
EECS, Computer Science Division
639 Soda Hall #1776
Berkeley, California 94720-1776 USA
sequin@cs.berkeley.edu

By blending arcs, this interpolating subdivision scheme for curves on the sphere produces fair-looking G2-continuous curves even through challenging sets of interpolation points.

Feature-Based Topological Mesh Metamorphosis

SEUNGYONG LEE

Pohang University of Science and Technology
Department of Computer Science
San 31 Hyoja-dong
Pohang 790-784
SOUTH KOREA
leesy@postech.ac.kr

A novel approach for 3D mesh morphing that simultaneously interpolates the topology and geometry of input meshes by using edge transformations and geomorphs.

Explicit Control of Topological Evolution in 3D Mesh Morphing

SHIGEO TAKAHASHI

Department of Graphics and Computer Science
Graduate School of Arts and Sciences
University of Tokyo
3-8-1 Komaba, Meguro-ku
Tokyo 153-8902 JAPAN
takahashis@acm.org

A new approach for explicitly specifying a path of topological evolution while morphing 3D meshes of different topological types.

4:15 - 6 pm

Room 406

Meshes

Session Chair

GARY TEMPLET

Sandia National Laboratories

**Dynamic Meshing Using
Adaptively Sampled
Distance Fields**

JACKSON POPE

MERL

201 Broadway Street, 8th Floor
Cambridge, Massachusetts 02139
USA

pope@merl.com

A new method of generating detail-directed, viewpoint-dependent, dynamic triangle meshes using adaptively sampled distance fields, which produces high-quality, low-triangle-count meshes.

**Mapping Independent
Triangulation of Parametric
Surfaces**

MARCO ATTENE

IMA-CNR

Via De Marini 6
Torre Di Francia
Genova 16149

ITALY

attene@ima.ge.cnr.it

Triangulation in parametric space can produce poor and even inconsistent meshes. This sketch describes an almost regular triangulation using inverse mapping that describes local stretching and twisting of the surface.

**Efficient Update of
Geometric Constraints in
the Tapestry Evolving Mesh
Representation**

MARYANN SIMMONS

University of California, Berkeley
EECS, Computer Science Division
537 Soda Hall #1776Berkeley, California 94720-1776 USA
simmons@cs.berkeley.edu

Using geometric constraints to provide an efficient and robust evolving mesh implementation as a basis for a fully dynamic tapestry display representation for interactive rendering.

**Compressing Large
Polygonal Models**

JEFFREY HO

Beckman Institute
University of Illinois at Urbana-
Champaign405 North Mathews Avenue
Urbana, Illinois 61801 USA

j-hol@dizzy.ai.uiuc.edu

Development and evaluation of methods for compressing large triangular meshes that are too complex to fit into main memory.

4:15 - 6 pm

Room 408

Simulation

Session Chair

RONEN BARZEL

Pixar Animation Studios

**Real-Time Cloth Simulation
with Sparse Particles**

MASAKI OSHITA

Department of Intelligent Systems
Kyushu University
6-10-1 Hakozaki, Higashi-Ku
Fukuoka City 812-8581 JAPAN
moshita@db.is.kyushu-u.ac.jp

A small number of particles is controlled for fast cloth simulation. The cloth surface is smoothed with their normals, which are computed from the elastic forces applied to each particle.

**Using Precomputed Cloth
Simulations for Interactive
Applications**

DANIEL L. HERMAN

Pixar Animation Studios

1511 44th Avenue
San Francisco, California 94122 USA
dh@digitalfish.com

A method for reconstructing the form of cloth dynamically draped on an animated body without the need to run a simulator during animation iteration.

**Modeling and Dynamics of
Clouds Using a Coupled
Map Lattice**

YOSHINORI DOBASHI

Hokkaido University
Kita 13, Nishi 8, Kita-ku
Sapporo 060-8628 JAPAN
doba@nis-ei.eng.hokudai.ac.jp

A new method of cloud modeling that uses a coupled map lattice to simulate cloud formation.

**A Fast Simulating System
for Realistic Motion and
Realistic Appearance of
Fluids**

YUKIO WATANABE

System LSI R&D Center
Toshiba Corporation
580-1, Horikawa-cho, Saiwai-ku
Kawasaki 212-8520 JAPAN
watanabe@sdel.toshiba.co.jp

A system to generate fast fluid animations that are realistic in both motion and appearance.

8:30 - 10:15 am

Room 403

Deformable Objects

*Session Chair*SIMON ALLARDICE
Lynda.com

Simulation of Deforming Elastic Solids in Contact

GENTARO HIROTA

Computer Science Department
University of North Carolina at Chapel Hill
CB# 3175 Sitterson Hall
Chapel Hill, North Carolina
27599-3175 USA
hirota@cs.unc.edu

Simulation of sliding contact between deformable, nonlinearly elastic bodies. How a novel finite-element approach capable of handling self- and inter-penetration was used to bend the knee of the Visible Human dataset.

A Computationally Efficient Framework for Modeling Soft Body Impact

SARAH FRISKEN

MERL
201 Broadway, 8th Floor
Cambridge, Massachusetts
02139 USA
frisken@merl.com

This framework uses adaptively sampled distance fields for quickly, efficiently, and accurately detecting collisions, computing impact forces, and determining contact deformation for soft bodies.

Hardware Acceleration for Physical Modeling of Deformable Objects

BENJAMIN BISHOP

University of Georgia
418 Graduate Studies Research Center
Athens, Georgia 30602 USA
bishop@cs.uga.edu

Exploring the possibility of using specialized hardware to greatly accelerate physical modeling of deformable objects. This sketch presents results from a first-generation specialized experimental hardware system.

Interactive Virtual Clay Using Implicit Surfaces and Particle Systems

MASATOSHI MATSUMIYA

Nara Institute of Science and Technology
8916-5 Takayama
Ikoma, Nara 630-0101 JAPAN
masato-m@is.aist-nara.ac.jp

A virtual clay model developed for interactive virtual clay works that exhibits clay-like deformation and can be calculated and rendered in real time.

THURSDAY, 16 AUGUST

8:30 - 10:15 am

Room 404

Haptics

*Session Chair*ED ANGEL
University of New Mexico

Spatial Resolution in Haptic Rendering

JULI YAMASHITA

National Institute of Advanced Industrial Science and Technology
Tsukuba Central 6
1-1-1, Higashi, Tsukuba-City
Ibaraki 305-8566 JAPAN
yamashita-juli@aist.go.jp

The effect of spatial resolution is still not clear in haptic rendering. This sketch reveals it by measuring absolute thresholds for surface smoothness using two point-contact haptic displays of different resolutions.

The Development of the Virtual Human Abdomen: Algorithms and Methodologies

KEVIN CHUGH

State University of New York at Buffalo
Virtual Reality Laboratory
809 Furnas Hall
Amherst, New York 14260 USA
chugh@buffalo.edu

Haptic simulation of an abdominal palpation examination. Featured topics: development of real-time haptic force-displacement algorithms and a non-invasive tissue property collection device.

Tangible Communication

KEN-ICHI KAMEYAMA

Toshiba Corporation
1, Komukai-toshiba-cho
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Kwasaaki 212-8582 JAPAN
kenichi.kameyama@toshiba.co.jp

On-going research on a mobile telecommunication system in which users can mutually transmit their ambient information and can feel mentally closer to each other.

Hand-Held Torque Feedback Device

YUKIO FUKUI

University of Tsukuba
1-1-1 Tennoudai
Tsukuba Ibaraki 305-8573 JAPAN
fukui@is.tsukuba.ac.jp

Unlike conventional force displays, which have some bases supporting reaction force, this proposed torque display requires no base, because it uses the angular momentum transition caused by controlled currents of three orthogonal motors.

8:30 - 10:15 am

Room 406

Narrative Gestures

Session Chair

KATHY NEELY

Fashion Institute of Technology

a

A Multipurpose Array of Tactile Rods for Interactive eXpression

DAN OVERHOLT

Massachusetts Institute of Technology
MIT Media Laboratory
254 Windsor Street, #3L
Cambridge, Massachusetts
02139 USA
dano@media.mit.edu

The MATRIX (Multipurpose Array of Tactile Rods for Interactive eXpression) offers real-time control of a deformable surface, enabling manipulation of a wide range of audio-visual effects.

a

genieBottles: An Interactive Narrative in Bottles

ALI MAZALEK

Massachusetts Institute of Technology
MIT Media Laboratory
20 Ames Street, E15-444
Cambridge, Massachusetts
02139 USA
mazalek@media.mit.edu

This application presents physical bottles as containers and controls for an interactive narrative. A conversation-based story unfolds as users release genie characters that live inside a set of glass bottles.

a

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Open Processes Create Open Products: "Interface Ecology" as a Metadisciplinary Base for CollageMachine

ANDRUID KERNE

Creating Media
380 Lafayette Street, Suite 202
New York, New York 10003 USA
andruid@creatingmedia.com

Most interactive artifacts are very finite state machines. Life is open-ended. Equal value in interface ecology opens the range of methodologies. Indeterminacy opens the set of possible states in CollageMachine.

CC BY-NC-SA

The Mouthesizer: A Facial Gesture Musical Interface

MICHAEL J. LYONS

ATR Media Integration & Communication Research Labs
2-2-2 Hikaridai, Seika-cho
Soraku-gun
Kyoto 619-0288 JAPAN
mlyons@mic.atr.co.jp

A new interaction paradigm that uses facial gestures to play music. Video input from a head-worn camera is converted to MIDI synthesizer controls using a computer-vision algorithm.

THURSDAY, 16 AUGUST

67

8:30 - 10:15 am

Room 408

Image-Based Rendering

Session Chair

DOUG ROBLE

Digital Domain

Image-Based Rendering and Illumination Using Spherical Mosaics

JAMES F. O'BRIEN

University of California, Berkeley
EECS, Computer Science Division
633 Soda Hall #1776
Berkeley, California 94720
USA
job@eecs.berkeley.edu

Extending concentric mosaics to spherical mosaics allows greater freedom of movement. Pre-computed diffuse and specular maps provide realistic illumination from high-dynamic-range image data for objects interactively added to the scene.

Image-Based Rendering for Animated Deforming Objects

HIROSHI KAWASKI

University of Tokyo
Institute of Industrial Science,
Department 3
4-6-1 Komaba, Meguro-ku
Tokyo 153-8505 JAPAN
h-kawa@sak.iis.u-tokyo.ac.jp

This IBR technique for making photo-realistic CG animation successfully rendered deformed velvet and fur, which is difficult to synthesize with MBR.

Rendering by Manifold Hopping

HEUNG-YEUNG SHUM

Microsoft Research China
Sigma Center, Floor 3
No. 49 ZhiChun Road
HaiDian District
Beijing 100080 CHINA
hshum@microsoft.com

Manifold hopping provides perceptually continuous navigation by using only a small number of strategically sampled manifold mosaics or multiperspective panoramas.

Image-Based Reconstruction of Shift-Variant Materials

HENDRIK P. A. LENSCH

Max-Planck-Institut für Informatik
Stuhlsatzenhausweg 85
Saarbruecken 66123 GERMANY
lensch@mpi-sb.mpg.de

This image-based method robustly fits average BRDFs to the different materials of real objects. Shift-variant behavior is modeled by projecting the acquired data into a basis formed by recovered BRDFs.

10:30 am - 12:15 pm

Room 403

Rendering Optimization

Session Chair

RANDY FRANK

Lawrence Livermore National Laboratory

k-DOPs as Tighter Bounding Volumes for Better Occlusion Performance

DIRK BARTZ

WSI/GRIS, Universität Tübingen
Auf der Morgenstelle 10/C9
Tübingen, 72076 GERMANY
bartz@gris.uni-tuebingen.de

Using discrete orientation polytopes (k-dops) as bounding volumes for occlusion culling. They represent a much tighter shape approximation than widely used axis-aligned bounding boxes.

Multi-Resolution Depth Buffer

EUGENE LAPIDOUS

Viewspace Technologies, Inc.
P.O. Box 2008
Saratoga, California 95070 USA
eugene@viewspace.com

A new type of multi-resolution depth buffer allows applications optimized for screen Z to take advantage of the high-precision depth buffer algorithms. The balance between precision and performance is software-adjustable.

Occlusion Culling and Summed-Area Tables

ANDREAS GENZ

Universität Bremen Informatik
P.O. Box 330 440
Bremen D-28334 GERMANY
genzo@informatik.uni-bremen.de

A method that integrates occlusion culling into the Catmul recursive-subdivision algorithm. Efficient culling is done via summed-area tables built from previously rasterized layers.

Computing Nearly Exact Visible Sets Within a Shaft With 4D Hierarchical Z-Buffering

NED GREENE

NVIDIA Corporation
Ned@ngreene.com

How a nearly minimal set of visible primitives within a shaft can be computed with a simple recursive subdivision procedure that performs 4D hierarchical z-buffering.

THURSDAY, 16 AUGUST

68

10:30 am - 12:15 pm

Room 404

vr

Virtual Landscapes

Session Chair

CHERYL STOCKON

Studio Firefly and Pratt Institute

PlaceWorld: An Integration of Shared Virtual Worlds

JON COOK

University of Manchester
Computer Science Building
Oxford Road
Manchester M13 9PL
UNITED KINGDOM
cookj@cs.man.ac.uk

PlaceWorld is designed to bring disparate electronic artworks together in a single multi-user virtual environment that affords social interaction.

Virtual Showcases

OLIVER BIMBER

Fraunhofer Institute for Computer Graphics
Joachim Jungius Strasse 11
Rostock 18059 GERMANY
obimber@rostock.igd.fhg.de

A new multi-user AR display system and developed real-time rendering and image transformation techniques.

ALVIN on the Web: Distributive Mission Rehearsal for a Deep Submersible Vehicle

JAN JUNGCLAUS

Fraunhofer Center for Research in Computer Graphics, Inc.
321 South Main Street
Providence, Rhode Island
29030 USA
jjungcla@crcg.edu
alvin.crcg.edu

This distributive online simulation system allows scientific and public users to collaboratively train and plan the Alvin submarine's missions in a realistic and interactive cockpit environment.

A Head-Mounted Projective Display and its Applications in Interactive Augmented Environments

HONG HUA

Beckman Institute
University of Illinois at Urbana-Champaign
405 North Mathews Avenue
Urbana, Illinois 61801 USA
Honghua@uiuc.edu

HMPD technology and its featured capabilities, a recent prototype for a compact HMPD implementation, and application examples for interactive augmented environments.

THURSDAY, 16 AUGUST

69

10:30 am - 12:15 pm

Room 408

sfx

Feature FX

Session Chair

DENA SLOTHOWER
Stanford University

Trees in “How the Grinch Stole Christmas:” Automating the Task of Creating and Rendering Large Numbers of Complex Objects

CHARLOTTE MANNING

Digital Domain
300 Rose Avenue
Venice, California 90291 USA
charo@d2.com

How hundreds of shots for “How the Grinch Stole Christmas” were quickly and efficiently populated with thousands of trees using a partly automated, optimized tree template system.

Procedural Dynamics System for Animating the Sleigh in “How the Grinch Stole Christmas”

MARKUS KURTZ

Digital Domain
300 Rose Avenue
Venice, California 90291 USA
markusk@d2.com

A procedural dynamics system that derives the dynamics of a CG sleigh depending solely on the sleigh’s motion and its interaction with the ground surface.

Rendering Semi-Solid Objects With Particles

SCOTT SINGER

PDI/DreamWorks
3101 Park Boulevard
Palo Alto, California 94306 USA
scott@pdi.com

The approach used to render deforming semi-solid mud objects without making them look like stretchy rubber sacks for “Shrek.”

Dynamic Flesh and Muscle Simulation: “Jurassic Park III”

DENNIS TURNER

Industrial Light + Magic
3155 Kerner Boulevard
San Rafael, California 94901 USA
den@ilm.com

How dynamic flesh and muscle simulation were used to add organic complexity to photo-realistic dinosaurs in “Jurassic Park III.”

2:15 - 4 pm

Room 403

sfx

Production Overviews

Session Chair

JUAN BUHLER
PDI/DreamWorks**"Budweiser Alien"
Commercial**LEANDRO ESTEBECORENA
Industrial Light + Magic
3155 Kerner Boulevard
San Rafael, California 94901 USA
leandro@ilm.com

ILM's Computer Graphics Commercials Department accepted the challenge of generating a CG stadium crowded with aliens and made it look real without the aid of references from set.

Whippin' up a StormALEX SEIDEN
212 Garfield Place
Brooklyn, New York 11215 USA
aseiden@hotmail.com

Months of planning, preparation, and execution go into every Super Bowl spot, right? Not always! This sketch looks at the making of one spot and the frenzy involved.

**The Living Forest:
The Story of a 3D Feature
Film in Europe**JUAN NOUCHE
DYGRA Films
Linares Rivas 9
La Coruña 15005 SPAIN
cristobal@filloa.com

"The Living Forest" ("el Bosque Animado") is a 3D feature film by Spanish animation studio DYGRA Films using Maya and in-house applications.

**Character Setup and
Animation for "3-2-1
Penguins!"**MICHAEL B. COMET
Big Idea Productions
206 Yorktown Center
Lombard, Illinois 60187 USA
michael.comet@bigidea.com

A summary of rigging and animation issues for this 3D, cartoon-style children's video, from user interface scripting to squash and stretch.

2:15 - 4 pm

Room 404

a

Interactive Art

Session Chair

HISHAM BIZRI
Massachusetts Institute of Technology**Permanent Shutdown:
Experiments in Interactivity**JUSTIN KENT
Massachusetts Institute of
Technology
195 Binney Street #2103
Cambridge, Massachusetts
02142 USA
justin@scientificent.com

Artificial intelligence finds assisted suicide, online trust accesses ownership and consumption, and interaction becomes anti-interaction — as art moves towards its own inevitable permanent shutdown.

**NATO.0+55+3d.Modular -
A New Real-Time and
Non-Real-Time Multimedia
Authoring and DSP
Environment**NETOCHKA NEZVANOV
0f003 Maschinenkunst
Stichting Steim
Achtergracht 19
1017 WL Amsterdam
THE NETHERLANDS
ecdysone@eusocial.com

An advanced, real-time and non-real-time 2D, 3D, VR, DV-FIREWIRE, audio-video and text library for IRCAM MAX distributed by Ircam, and 0f0003.

GAL

**Digital Stupa:
Interactive Animations**DANIEL PIROFSKY
Portland State University
Department of Art
P.O. Box 751
Portland, Oregon 97207-0751 USA
pirofskyd@pdx.edu

Playful meditations on algorithmically discovered, non-objective images. Source animations are recomposed as maps to be explored through non-linear playback of frames in unique, spontaneous space/time sequences.

**My Finger's Getting Tired:
Interactive Installations for
the Mind and Body**DON RITTER
Pratt Institute
Department of Computer Graphics
and Interactive Media
200 Willoughby Avenue ARC F11
Brooklyn, New York 11205 USA
ritter@aesthetic-machinery.com

Documentation of large installations that use interactivity as content and require users to use their bodies to simultaneously control unencumbered interactive experiences for multiple users.

2:15 - 4 pm

Room 406

Architectures

*Session Chair*SIMON ALLARDICE
Lynda.com**Imaging the Living Computer:
Neuroscience Methods in
Visualizing the Performance
of Parallel Programs**DANIEL L. HERMAN
DigitalFish Films
dh@digitalfish.com

Neuros is a system for graphical visualization of program executions on parallel computers. It consists of an extensible, configurable toolkit that provides still-frame and animated views of parallel tracefiles.

g/it**Mayhem: A New Trend for
Virtual Environments (and
Online Games)**MANUEL OLIVEIRA
University College London
Gower Street
London WC1E 6BT
UNITED KINGDOM
m.oliveira@cs.ucl.ac.uk

This prototype massive online role-playing game uses new concepts and approaches from research to create a constantly evolving virtual environment that scales according to the number of users.

w**CONTIGRA: A High-
Level XML-Based
Approach to Interactive
3D Components**RAIMUND DACHSELT
Dresden University of Technology
Lehrstuhl Multimediatechnik
Dresden 1062 GERMANY
dachsel@inf.tu-dresden.de

A flexible 3D component architecture based on XML languages. Due to various abstraction levels and independence from specific 3D toolkits, it allows interdisciplinary development of 3D applications.

w**X3D Content Examples,
Editing, Conformance Suite,
and Software Development
Kit (SDK) CDs**DON BRUTZMAN
Naval Postgraduate School
Code UW/Br
Monterey, California 93943 USA
brutzman@nps.navy.mil

Content examples, editing, conformance suite, and software development kit (SDK) CDs for VRML 200x, extensible 3D (X3D) graphics.

THURSDAY, 16 AUGUST

2:15 - 4 pm

Room 408

Rendering Nouveau

*Session Chair*MAUREEN NAPPI
New York University**Symplectic Ray Tracing:
Ray Tracing With
Hamiltonian Dynamics in
Black-Hole Spacetime**TETSU SATOH
Nara Institute of Science and
Technology
8916-5 Takayama-cho
Ikoma, JAPAN
tetu-s@is.aist-nara.ac.jp

Symplectic ray tracing presents a new technique for visualizing curved black-hole spacetime. Efficient computation for CG based on the ray tracing is realized by using Hamilton's canonical equation with symplectic numerical analysis.

**Colored-Paper Mosaic
Rendering**SANG HYUN SEO
Chung-Ang University
221 HukSuk Dong, DongJok Gu
Seoul 156-756 SOUTH KOREA
ddipdduk@cglab.cse.cau.ac.kr

In response to growing concern about non-photorealistic rendering, this sketch proposes a colored-paper mosaic-rendering technique that can automatically generate torn and tagged colored-paper mosaic effects.

Real-Time Stroke TexturesBERT FREUDENBERG
Otto-von-Guericke-Universität
Magdeburg
Institut für Simulation und Graphik
Postfach 4120
Magdeburg 39106 GERMANY
bert@isg.cs.uni-magdeburg.de

Shading in line drawings is expressed by varying stroke width or density of strokes. This new method can do it either way, introducing lighting-dependent surface detail to interactive NPR.

4:15 - 6 pm

Room 403

sfx

Fuzzy Creatures

Session Chair

CARY PHILLIPS

Industrial Light + Magic

Practical Image-Based
Lighting for Fur and Surfaces

DEBORAH CARLSON

Sony Pictures Imageworks
5750 West Centinela Avenue #309
Los Angeles, California 90045 USA
dcarlson@imageworks.com

In the image-based lighting pipeline at Centropolis Effects, lighting is captured with HDR fisheye photography and used in Photorealistic RenderMan for both surfaces and fur.

Lifting Detail from Darkness

J.P. LEWIS

Disney TSL
3100 Thornton Avenue
Burbank, California 91505 USA
zilla@computer.org

A high-quality method for separating detail from overall image region intensity. This intensity-detail decomposition can be used to automate some specialized image alteration tasks.

Grooming and Rendering
Cats and Dogs

PEDRO HUANG

Rhythm & Hues Studios
5404 Jandy Place
Los Angeles, California 90066 USA
huang@rhythm.com

For the visual effects in "Cats and Dogs," Rhythm and Hues developed techniques for modeling, grooming and animating photo-realistic digital fur.

Skinning Cats and Dogs
Using Muscle Deformations

HANS RIJPKEMA

Rhythm & Hues Studios
5404 Jandy Place
Los Angeles, California 90066 USA
hans@rhythm.com

Techniques used for "skinning" animal characters in "Cats and Dogs."

4:15 - 6 pm

Room 404

g/it

Interaction Mechanisms

Session Chair

HISHAM BIZRI

Massachusetts Institute of Technology

View-Dependent Texture
Mapping of Video for
Realistic Avatars in
Collaborative Virtual
Environments

VIVEK RAJAN

Electronic Visualization Laboratory
University of Illinois at Chicago
901 South Ashland Avenue, #810A
Chicago, Illinois 60607 USA
vrajan@evl.uic.edu

How projective texturing of video onto a reasonably accurate 3D model of the user's head can be used to produce realistic avatars in real time.

Non-Graphical Application
of Hardware-Accelerated
Voxelization

STEFFI BECKHAUS

GMD - Institute for Media
Communication
Schloss Birlinghoven
53754 Sankt Augustin
GERMANY
steffi.beckhaus@gmd.de

Using hardware-accelerated voxelization to convert a scene into the voxel space with identification of unique, single objects. The voxelized scene supports a system for automatic presentation of objects.

vr

Manipulate the
Unreachable: Through-the-
Lens Remote Object
Manipulation in Virtual
Environments

STANISLAV L. STOEV

University of Tuebingen
Auf der Morgenstelle 10, C9
Tübingen 72076 GERMANY
sstoev@gris.uni-tuebingen.de

A technique for defining an additional viewpoint in an explored virtual world and manipulating objects through the window that displays the world as seen from this viewpoint.

Intuitive Multiple
Viewpoints Control Using
Interlocked Motion of
Coordinate Pairs

SHINJI FUKATSU

Osaka University
2-1 Yamadaoka
Suita-shi
Osaka 565-0871 JAPAN
fukatsu@cic.eng.osaka-u.ac.jp

This sketch proposes the ginterlocked motion of coordinate pairs has a manipulation technique for intuitively controlling multiple viewpoint (specifically, additional viewpoints and the primary viewpoint).

THURSDAY, 16 AUGUST

4:15 - 6 pm

Room 408

Digital Representation

Session Chair

MAUREEN NAPPI
New York University

VR

Enhanced Reality: A New Frontier for Computer Entertainment

RICHARD MARKS

Sony Computer
Entertainment America
919 East Hillsdale Boulevard,
2nd Floor
Foster City, California 94404 USA
richard_marks@playstation.sony.com

A new form of computer
entertainment that enables
movie-like special effects in
real time in your own home.

ComicDiary: Representing Individual Experiences in Comics Style

RYUUKI SAKAMOTO

ATR Media Integration &
Communications Research
Laboratories/Japan Advanced
Institute of Science and Technology
2/2/02 Hikaridai, Seika-cho
Soraku-gun
Kyoto 619-0288 JAPAN
skmt@jaist.ac.jp

A system that automatically
creates a personal diary in
comic style by using the user's
touring records at an exhibi-
tion and environmental events.

VR

Life-Sized Projector-Based Dioramas: Spatially Real and Visually Virtual

KOK-LIM LOW

University of North Carolina at
Chapel Hill
Department of Computer Science
Campus Box 3175, Sitterson Hall
Chapel Hill, North Carolina
27599-3175 USA
lowk@cs.unc.edu

A framework to re-create
a real place by using projectors
and display surfaces that closely
approximate the geometry of
the scene. The result is a spa-
tially very realistic virtual
environment.

a VR 

Sketching Space: Virtual to Real

BILL BRODY

University of Alaska Fairbanks
910 Yukon Drive, Suite 108
Fairbanks, Alaska 99775 USA
brody@arsc.edu

Sketches in virtual reality are
converted to tangible objects
by drawing in space and
translating the energy
employed in drawing into
a cleanly tessellated surface
for rapid prototyping.

8:30 - 10:15 am

Room 403

Light Fields

Session Chair
DOUG ROBLE
Digital Domain

Locally Reparameterized Light Fields

SING BING KANG
Microsoft Corporation
One Microsoft Way
Redmond, Washington
98052 USA
sbkang@microsoft.com

This sketch proposes a locally reparameterized light field for efficient handling of nonrigid effects such as reflections and specularities. It works by modeling the diffuse and nonrigid effects as separate local geometries.

Light Field Rendering with Triangular Viewpoint Mesh

DONGHO KIM
The George Washington University
20266 River Ridge Terrace, #100
Asburn, Virginia 20147 USA
dkim@seas.gwu.edu

In this new light field rendering scheme, viewpoints are located at the vertices of triangular mesh. Rendering error can be reduced because smaller number of the image samples are used.

Multi-Resolution Light-Field Rendering With the Wavelet Stream

INGMAR PETER
WSI/GRIS
Universität Tübingen
Auf der Morgenstelle 10, C9
Tübingen 72076 GERMANY
peter@gris.uni-tuebingen.de

A new data structure for wavelet-based light field compression that allows for interactive reconstruction and rendering. An additional silhouette-encoding scheme improves both coding efficiency and reconstruction quality.

FRIDAY, 17 AUGUST

8:30 - 10:15 am

West Hall A

sfx

Death and Destruction

Session Chair
GARY PIMENTEL
Evans & Sutherland

The Attack on Pearl Harbor Battleship Row: Everything Including the Kitchen Sink

DAVID FREDERIC HORSLEY
Industrial Light + Magic
3155 Kerner Boulevard
San Rafael, California 94901 USA
horsley@ilm.com

The challenge of "Pearl Harbor" was determining what it would take to execute a series of complex bombing scenes with a multiplicity of actions happening simultaneously.

Crashing Planes the Easy Way: "Pearl Harbor"

SCOTT BENZA
Industrial Light + Magic
3155 Kerner Boulevard
San Rafael, California 94901 USA
benza@ilm.com

Aircraft destruction in "Pearl Harbor" was made possible by taking an alternative approach to rigid body systems. This presentation demonstrates ILM's technique for creating realistic dynamic simulations for the film.

Paint the Town Red: Recreating Stalingrad For "Enemy at the Gates"

PAUL FRANKLIN
Double Negative Ltd.
77 Shaftesbury Avenue
London W1V 8HQ
UNITED KINGDOM
paul@dneg.com

The story of how Double Negative combined digital painting and 3D modeling to recreate the war-torn landscape of the 20th century's bloodiest battle.

Destroying a Dam Without Getting Wet: Rule-Based Dynamic Simulation for "Wave of Death"

STEPHAN TROJANSKY
CA Scanline Production GmbH
Bavariafilmplatz 7
Gebäude 48
München 82031 GERMANY
troja@scanline.de

Rule-based dynamic simulation in "The Wave of Death," featuring a dam-breaching sequence, closes the gap between mathematical accuracy and animator creativity.

FRIDAY, 17 AUGUST

75

8:30 - 10:15 am

Room 408

Model Capture

Session Chair

DAVID "GRUE" DEBRY
Industrial Light + Magic

Computing 3D Geometry Directly From Range Images

SARAH FRISKEN
MERL
201 Broadway, 8th floor
Cambridge, Massachusetts 02139
USA
frisken@merl.com

This fast method for computing geometry from range images uses adaptively sampled distance fields for efficient sampling and intuitive editing of geometry, and generates optimal triangle models interactively.

Micro Archiving

TATSUYA SAITO
Keio Univerisy
5322 Endo
Fujisawa, Kanagawa 252-8520
JAPAN
tatsu@wem.sfc.keio.ac.jp

Micro archiving enables easy construction of 3D models for use in digital archives of the microcosmic world.

Calibration-Free, Easy 3D Modeling From Turntable Image Sequences

SUMIT GUPTA
National University of Singapore
Department of Electrical and
Computer Engineering
10 Kent Ridge Crescent
SINGAPORE 119260
eleks@nus.edu.sg

A calibration-free silhouette based 3D object modeling techniques. For computer graphics practitioners who are not computer vision experts, this is a flexible and easy tool.

A Flexible Approach to 3D Reconstruction From Single Images

S.S. EL-HAKIM
The Visual Information Technology
National Research Council
1500 Montreal Road
Ottawa, Ontario K1A 0R6
CANADA
sabry.el-hakim@nrc.ca

An accurate and flexible method for 3D reconstruction from single images. The presentation includes examples using images or paintings of destroyed structures and images of remote sites taken by tourists.

10:30 am - 12:15 pm

Room 403

Models of Visual Representation

Session Chair

CHERYL STOCKTON

Studio Firefly and Pratt Institute

VideoFOCUS and VideoFOCUSWire: Transforming Moving Images to Stills

LAURA TEODOSIO

Salient Stills Inc.

268 Summer Street, Sixth Floor
Boston, Massachusetts 02210 USA
teo@salientstills.com

A new model of VideoFOCUS (a tool that produces high-quality still imagery from low-resolution moving imagery) is designed specifically for image acquisition and distribution that uses video as input.

Change Blindness With Varying Rendering Fidelity: Looking But Not Seeing

KIRSTEN CATER

University of Bristol
Department of Computer Science
Woodland Road
Bristol BS8 1UB
UNITED KINGDOM
cater@cs.bris.ac.uk

Change blindness is the human inability to detect what should be obvious changes in a scene. It can be exploited to significantly reduce computational time while retaining perceptual fidelity.

sfx

"Summer Breeze:" Creating a High-End 3D Movie Using Limited Resources

SHENG-FANG CHEN

School of Visual Arts New York
133 West 21st Street, 10F
New York, New York 10010 USA
shengfan@sva.edu

"Summer Breeze" is a short animation developed without a budget, using off-the-shelf tools. It is an attempt to prove that sophisticated computer animation can be created in an independent environment.

sfx

The Magic Behind the Magic: "Pearl Harbor"

MARSHALL KRASSER

Industrial Light + Magic
3155 Kerner Boulevard
San Rafael, California 94912 USA
marshall@ilm.com

For every spectacular shot that appears in a movie, there are untold scores of dedicated people who helped achieve its (hopefully) flawless execution.

FRIDAY, 17 AUGUST

76

10:30 am - 12:15 pm

Room 404

Visualization

Session Chair

ED ANGEL

University of New Mexico

The Empathic Visualization Algorithm: Chernoff Faces Revisited

ANDREAS LOIZIDES

University College London
Department of Computer Science
Gower Street
London WC1E 6BT
UNITED KINGDOM
a.loizides@cs.ucl.ac.uk

A method for constructing an automatic mapping from data to visual structure which enforces a homomorphism between important characteristics of the data and the emotional/perceptual impact of the visual structure.

C A L

Death Valley Flyby: A Simulation Comparing Fault-Controlled Alluvial Fans Along the Black Mountain Range

CARLOS SELIGO

Stanford University
423 Sweet Hall, 4th Floor
590 Escondido Mall
Stanford, California 94305-3091
USA
moth@stanford.edu

This simulated fly-by of Death Valley was created from public digital elevation models and satellite photographs. With current technology, geological formations almost anywhere in the world can be inexpensively rendered.

Immersive Visualization of a Very-Large-Scale Seismic Model

PRASHANT CHOPRA

Mississippi State University
Engineering Research Center
1120 East Lee Boulevard,
Apartment 107
Starkville, Mississippi 39759 USA
prash@erc.msstate.edu

An ongoing attempt to interactively and immersively visualize a very-large-scale seismic dataset (11,800,649 nodes) over both spatial and temporal domains using a CAVE and an Immersadesk.

3D Traffic Visualization in Real Time

ANDRE GUEZIEC

Consultant
365 America Avenue
Sunnyvale, California 94085 USA
gueziec@computer.org

A system for generating a short narrated animation of highway traffic conditions in a large metropolitan area at a particular moment in time.

10:30 am - 12:15 pm

Room 406

Realtime Applications

Session Chair

RANDY FRANK

Lawrence Livermore National Laboratory

Collisions and Adaptive Levels of Detail

JOHN DINGLIANA

Image Synthesis Group,
Computer Science Department
Trinity College
Dublin, IRELAND
John.Dingliana@cs.tcd.ie

Simplification is often a necessary trade-off for guaranteeing real-time performance in physically based animation. This sketch summarizes an adaptive level-of-detail approach that uses priority-based scheduling strategies for optimising the speed-complexity trade-off.

Time-Critical Volume Rendering

HAN-WEI SHEN

The Ohio State University
395 Dreese Lab
2015 Neil Avenue
Columbus, Ohio 43210 USA
hwshen@cis.ohio-state.edu

A time-critical algorithm for hierarchical volume rendering.

Visual Attention Driven Progressive Rendering for Interactive Walkthroughs

JÖRG HABER

Max-Planck-Institut für Informatik
Stuhlsatzenhausweg 85
Saarbrücken 66123 GERMANY
haberj@mpi-sb.mpg.de

Pre-computed global-illumination solutions using graphics hardware to interactively render photometrically complex scenes. A visual-attention model guides corrective ray tracing. Resulting samples are splatted into framebuffer and cached for reprojection.

Real-Time Rendering of Populated Urban Environments

FRANCO TECCHIA

University College of London
Department of Computer Science
Gower Street
London WC1E 6BT
UNITED KINGDOM
F.Tecchia@cs.ucl.ac.uk

Complex urban environments are common in computer graphics applications, but they often look empty and lifeless. This sketch proposes methods for real-time rendering of virtual cities populated by thousands of animated individuals.

FRIDAY, 17 AUGUST

77

10:30 am - 12:15 pm

Room 408

Texturing

Session Chair

GARY PIMENTEL

Evans & Sutherland

Texture and Shape Synthesis on Surfaces

LEXING YING

New York University
719 Broadway, 12th Floor
New York, New York 10003 USA
lexing@mrl.nyu.edu

A method for synthesizing functions on surfaces by example and how to create color and geometric textures.

Growing Fitted Textures

GABRIELE GORLA

University of Minnesota
4-192 EE/CSci Building
200 Union Street, Southeast
Minneapolis, Minnesota 55455 USA
gorlik@acm.org

A method for covering the surface of polygonally defined models with a texture pattern derived from an acquired image following an arbitrary direction field at a per pixel level.

Hardware-Accelerated High-Quality Filtering of Solid Textures

MARKUS HADWIGER

VRVis Research Center for Virtual Reality and Visualization
Lothringerstrasse 16/4
Vienna 1030 AUSTRIA
msh@vrvis.at

Current consumer graphics hardware can apply solid textures to 2D surfaces, employing trilinear interpolation for filtering. This sketch presents a general approach for hardware-accelerated filter kernels of higher order.

Averaged Area Tables for Texture Filtering

UWE BEHRENS

Digital Domain
300 Rose Avenue
Venice, California 90291 USA
ubehrens@d2.com

A modification of summed-area tables that avoids the memory overhead associated with them. It is also faster to evaluate, and provides higher-quality results, than MIP maps.

2:15 - 4 pm

Room 403

Stylization in Animated Films

*Session Chair*CASSIDY CURTIS
PDI/DreamWorks**RainMan: Fluid Pseudodynamics With Probabilistic Control for Stylized Raindrops**DANIEL L. HERMAN
Pixar Animation Studios
1511 44th Avenue
San Francisco, California 94122 USA
dh@digitalfish.com

This directable system for simulating fluid flow based on pseudodynamic techniques introduces some novel mechanisms of control while relying on both physical and non-physical methods.

Fast-Moving Water in DreamWorks "Spirit"SATY RAGHAVACHARY
DreamWorks Feature Animation
Room 223, Riverside Building
1000 Flower Street
Glendale, California 91214 USA
saty@anim.dreamworks.com

A novel way to use particles as surface-deformation fields to achieve the look of fast-moving water.

Hybrid Ink-Line Rendering in a Production EnvironmentRASMUS TAMSTORF
Walt Disney Feature Animation
500 South Buena Vista Street
Burbank, California 91521 USA
rasmus.tamstorf@disney.com

A hybrid ink-line renderer developed at Walt Disney Feature Animation and some lessons learned from using it for animated feature films, including "Atlantis."

Creative Approaches to the Integration of CGI With Traditional Animation in Disney's "Atlantis: The Lost Empire"KIRAN JOSHI
Walt Disney Feature Animation
500 South Buena Vista Street
Burbank, California 91521 USA
kiran.joshi@disney.com

How CGI was integrated into the creative process in production of Disney's first action-adventure animated feature.

FRIDAY, 17 AUGUST

2:15 - 4 pm

Room 404

sfx

On-Set CG*Session Chair*DAVID "GRUE" DEBRY
Industrial Light + Magic**Real-Time Computer Graphics for On-Set Visualization: "A.I." and "The Mummy Returns"**SETH ROSENTHAL
Industrial Light + Magic
3155 Kerner Boulevard
San Rafael, California 94901 USA
seth@ilm.com

Real-time camera tracking, real-time motion capture, and computer graphics were used to give film directors the ability to visualize 3D effects shots during production of "A.I." and "The Mummy Returns."

"2001: An MR-Space Odyssey:" Applying Mixed-Reality Technology to VFX in FilmmakingTOSHIKAZU OHSHIMA
Mixed Reality Systems
Laboratory Inc.
6-145 Hanasaki-cho, Nishi-ku
Yokohama 220-0022 JAPAN
ohshima@mr-system.co.jp

How mixed-reality technology can be applied to making visual effects in filmmaking. Actors and actresses, and the director and/or cinematographer can see the effects in real time in rehearsal.

An Integrated Solution to Camera Animation for StageMATHEW LAMB
Digital Domain
300 Rose Avenue
Venice, California 90291 USA
matthew@v3a.com

A fast, accurate, and production-hardened methodology for taking camera animation and generating the corresponding move on a motion-control stage.

Elmo's World: Digital Puppetry on "Sesame Street"EMRE YILMAZ
P.O. Box 460022
San Francisco, California
94146-0022 USA
eyilmaz@pobox.com

The real-time digital puppetry process used to bring five furniture creatures to life for Sesame Street and how this process fit into the production.

FRIDAY, 17 AUGUST

79

2:15 - 4 pm

Room 408

HDR/Environmental Capture

Session Chair

DARIN GRANT
Digital Domain

Image-Based Photometric Reconstruction for Mixed Reality

SIMON GIBSON
University of Manchester
Department of Computer Science
Oxford Road
Manchester M13 9PL
UNITED KINGDOM
gibsons@cs.man.ac.uk

A new approach to reconstructing material and illumination data from sets of images. Examples show the use of reconstructed data in augmented-reality-style applications.

A Real-Time High Dynamic Range Light Probe

JAMIE WAESE
USC Institute for Creative
Technologies
13274 Fiji Way, 5th Floor
Marina del Rey, California
90292 USA
waese@ict.usc.edu

A technique for capturing multiple-exposure, high-dynamic-range images within a single frame. This makes it possible to measure omnidirectional incident illumination of light probes in real time.

Light Stage 2.0

TIM HAWKINS
USC Institute for Creative
Technologies
13274 Fiji Way, 5th Floor
Marina del Rey, California 90292
USA
timh@ict.usc.edu

The second generation prototype of a lighting apparatus designed for capturing reflectance properties of human faces.

HDR Shop

CHRIS TCHOU
USC Institute for Creative
Technologies
13274 Fiji Way, Suite 500
Marina del Rey, California 90292
USA
tchou@ict.usc.edu

HDR Shop is an image editor designed to work natively with high dynamic range images. It supports HDR compilation from LDR image sequences, panorama resampling, filters, operations, and external editing.

Educators Program

"Tell me and I may forget. Show me and I may not remember. Involve me and I will understand and learn." — Native American saying

Innovative and creative uses of computer graphics and interactive techniques that focus on physical and virtual computer-supported, collaborative-learning environments, activities, and materials.

NEW! The SIGGRAPH 2001 Educators Program presents Open Forums where attendees and presenters explore and exchange ideas, share perspectives, build community relationships, and interact and connect with educators, researchers, practitioners, and industry experts.

Chair

COLLEEN CASE
Schoolcraft College

Location

**Rooms 502B, 503, 504, 505
and CAL**

Days & Hours

Sunday, 12 August
5 - 7 pm
Monday, 13 August
8:30 - 10 am
Tuesday, 14 August
8:30 - 10 am
Wednesday, 15 August
10:30 am - 5 pm
Thursday, 16 August
8:30 am - 6 pm
Friday, 17 August
8:30 am - 4 pm

Committee

ART DURINSKI
The Durinski Design Group

MARK HARRIS
Schoolcraft College

SUSAN LUPO
Schoolcraft College

MICHAEL MEHALL
Schoolcraft College

JAMES L. MOHLER
SIGGRAPH 2002 Educators
Program Chair
Purdue University

JACQUELYN FORD MORIE
USC Institute for Creative
Technologies

STEPHEN WROBLE
Schoolcraft College

Jury

ART DURINSKI
The Durinski Design Group

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Schoolcraft College

JAMES L. MOHLER
SIGGRAPH 2002 Educators
Program Chair
Purdue University

JACQUELYN FORD MORIE
USC Institute for Creative
Technologies

STEPHEN WROBLE
Schoolcraft College

Administrative Assistant

MELINA BUSH
Schoolcraft College

Throughout the Week Concourse Hall 150, 151, 152 I.R.I.S. New Models of Communication (demonstration in Emerging Technologies) I.R.I.S. (Intelligent Recognition Inference System) is an environment that invites learners to re-see the world by evoking openness to new patterns of thought. Its role is to propose new ways of thinking about how information space can be transformed into work space in the context of a corporate learning center. MURRY CHRISTENSEN Goldman, Sachs & Co. The Goldman Sachs Group, Inc. 180 Maiden Lane, 21st Floor New York, New York 10038 USA murry.christensen@gs.com ELI KUSLANSKY Unified Field/4D Visual	5 - 7 pm Room 502B Opening Session Educators Program “Ramp-In” to SIGGRAPH 2001 An overview and guidebook of highlights and recommended sessions for SIGGRAPH 2001. COLLEEN CASE SIGGRAPH 2001 Educators Program Chair Schoolcraft College Computer Graphics Technology 18600 Haggerty Road Livonia, Michigan 48152 USA ccase@schoolcraft.cc.mi.us MIKE McGRATH Colorado School of Mines ACM SIGGRAPH Director for Education	8:30 - 10 am Room 503 Forum The Emerging Computer Graphics Discipline Like the emergence of statistics as an academic discipline, many educators are asking if it is time for computer graphics programs to stand on their own. This discussion focuses on the emerging computer graphics discipline. GARY R. BERTOLINE Purdue University Department of computer Graphics Technology 1419 Knoy Hall, Room 363 West Lafayette, Indiana 47907-1419 USA grbertol@tech.purdue.edu
TUESDAY, 14 AUGUST		
Areas of Interest sfx Animation & Special Effects a Art g/it Game Development & Interactive Techniques vr Virtual Reality w Web-related		
8:30 - 10 am Room 503 Forum Games and Education Dialogue with gaming professionals on how games affect students, and the potential of gaming in education and training. JACQUELYN FORD MORIE USC Institute for Creative Technologies CELIA PEARCE University of Southern California		

10:30 - 11 am

Room 505

Paper

w

Internet Studios: Teaching Architectural Design Online in the United States and Latin America

A summary of the pedagogical use of high-end computer graphics and low- and high-bandwidth Internet technology for international architectural education collaboration among seven universities in the Americas.

ALFREDO ANDIA
Florida International University
Internet Studio Consortium
236 VH Building
School of Architecture
Miami, Florida 33199 USA
alfredoandia@yahoo.com

10:30 - 11 am

Room 502B

Paper

g/it

Speeder Reader:
An Experiment in the Future
of Reading

What if words flash to you, rather than appearing in a static line across a page? How does it feel to drive through a book? Speeder Reader is a speed-reading protocol (RSVP) combined with a speed-racing videogame interface for interactive reading. Designed as part of XFR: Experiments in the Future of Reading, Speeder Reader was displayed at the Tech Museum of Innovation.

JONATHAN COHEN
RICH GOLD
STEVE HARRISON
SCOTT MINNEMAN
MARIBETH BACK
Xerox PARC
3333 Coyote Hill Road
Palo Alto, California 94304 USA
back@parc.xerox.com

11:15 am - 12:15 pm

Room 505

Panel

21st Century Literacy:
Media and Meaning

What does literacy in the 21st century look like? What should it look like? In today's media-pervasive society, both makers and consumers of media should examine how we make, and make use of, online and video content.

ANTHONY CHAPMAN
Thirteen/WNET New York
FAITH ROGOW
Insighters Educational Consulting Inc.
ELANA ROSEN
JustThink Foundation.
SARAH FELDMAN
Oxygen Media, Inc.
75 West Ninth Avenue, 7th Floor
New York, New York 10011 USA
sfeldman@oxygen.com

11:30 am - noon

Room 502B

Paper

w

Internet2 Applications and
Infrastructure

An overview of the effort by over 180 universities to establish the next-generation Internet to support advanced applications in research, teaching, and learning environments.

TED HANSS
Internet2
3025 Boardwalk, Suite 100
Ann Arbor, Michigan 48108 USA
ted@internet2.edu

2 - 3 pm

Room 502B

Panel

a w

Designing Experience:
Modeling On-Line
Collaborative Learning in
Art & Design

How can designers involve learners in constructing and personalizing digital environments? This panel explores emerging trends in designing experience-based, online learning environments.

SUSAN KOZEL
Technical University of British Columbia
ALICE MANSELL
RON WAKKARY
Technical University of British Columbia
STEVE DiPAOLO
THECLA SCHIPHORST
Technical University of British Columbia
Suite 301, 10334-152 A St
Surrey, British Columbia
V3R 7P8 CANADA
schiphorst@tech.bc.ca

2:30 - 4 pm

Room 503

Forum

Explorations in Visual
Communications and Meaning

Panelists and attendees explore communications and meaning.

SUSAN LUPO
Schoolcraft College/Schoolcraft College
18600 Haggerty Road
Livonia, Michigan 48152 USA
slupo@schoolcraft.cc.mi.us

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
XEROX PARC

4:15 - 4:45 pm

Room 502B

Paper

w

Webtanks: Tools for
Learning by Design

Webtanks are collaborative Web environments that can be used as project frameworks and knowledge-management repositories to support students as designers and inventors.

ZANN GILL
Research Institute for Advanced
Computer Science
NASA Ames Research Center
MS 19-39
Moffett Field, California 94035-1000 USA
sgill@mail.arch.nasa.gov

8:30 - 9 am

Room 505

Paper

Curricular Modules: 3D and Immersive Visualization Tools for Learning

3D animations are better than static 2D models (such as textbooks and blackboards) for presenting dynamic scientific principles. This National Science Foundation-funded project uses multi-sensory modules, including some with haptics developed by cross-disciplinary teams, to immerse users in a 3D environment.

BRIDGET BAIRD
STEVE LOOMIS
Connecticut College

ANDREA WOLLENSAK
Connecticut College
270 Mohegan Avenue #5641
New London, Connecticut 06320 USA
ajwol@conncoll.edu

8:30 - 9 am

CAL

Paper

Life Drawing and 3D Figure Modeling With Maya

In Yale University workshops, students scan sketches drawn from life and use them as reference image planes to model the human figure in Maya 3.0.

GREGORY P. GARVEY
Yale University Digital Media
Center for the Arts
149 York Street
New Haven, Connecticut 06520 USA
gregory.garvey@quinnipiac.edu

8:30 - 11:30 am

Room 504

Paper

Hands-On Classical Animation Workshop

The language of animation is universal. It transcends cultural barriers and bridges the great divide between art and technology. This hands-on experiential workshop in classical animation offers a solid foundation in the art of animation that can be translated into digital productions.

CLIFFORD COHEN
AnimAction, Inc.
1529 North Cahuenga Boulevard
Hollywood, California 90028 USA
cliffo@animaction.com

9 - 11 am

CAL

Workshop

Life Drawing and 3D Figure Modeling with Maya

A participatory hands-on workshop based on human-figure-modeling sessions at the Yale University Digital Media Center for the Arts.

GREGORY P. GARVEY
Yale University Digital Media
Center for the Arts
149 York Street
New Haven, Connecticut 06520 USA
gregory.garvey@quinnipiac.edu

10:15 am - 12:15 pm

Room 502B

Workshop

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

How to get a job at a visual effects, computer animation, or interactive company with an irresistible résumé, portfolio, or demo reel. Sample résumés and demo reels are presented.

PAMELA THOMPSON
Ideas to Go
pamrecruit@aol.com

11:30 am - 12:30 pm

Room 505

Panel

Designing and Developing Interactive Entertainment at Bell h@bitat, Canadian Film Centre

The School of New Media at the Canadian Film Centre (Bell h@bitat) offers project-oriented, team-based training for producing designs that integrate interactivity and emotional engagement with new forms of digital media. This panel discusses the successes and challenges of running a flexible, experience-based curriculum in an incubator-like setting that focuses on product development, team building, and critical thinking.

JEROME DURLAK
York University

DARRYL WILLIAMS
Ryerson Polytechnic University

ANA SERRANO
Bell h@bitat
Canadian Film Centre
2489 Bayview Avenue
Toronto, Ontario M2L 1A8 CANADA
aserrano@cdfilmcentre.com

12:30 - 2 pm

Room 503

Forum

The Teaching of Computer Graphics in an Art & Design Curriculum

As curriculums expand, so will the definition of the digital medium and how we embrace it in the arts. This forum on teaching computer graphics in an art and design curriculum confronts a critical question: Where do we position and how do we resolve computer graphics in the larger fine art context?

DENA EBER
HEATHER ELLIOTT
MARK MARCIN
Bowling Green State University
School of Art, Room 1000
Fine Arts Center
Bowling Green, Ohio 43403 USA

2 - 2:30 pm

Room 502B

Paper

The Process Behind "Rupert," a Student-Produced 3D Animation

This paper describes a student 3D animation produced in an evolving collaboration. Staying focused on collaboration and the story while producing animation provided an exceptional educational experience. Memories, storyboards, and videos help educators plan similar experiences.

SCOTT PORTER
Brigham Young University
3620 Castano Drive
Camarillo, California 93010 USA
sap@email.byu.edu

2 - 3 pm

Room 505

Panel

a

Seeing Drawing

Drawing is central to all that is produced by art and design practitioners. It is the core around which the conceptual and intellectual development of students take place. A number of art and design institutions in the United Kingdom have developed products that address the important subject of drawing, focusing on the process of developing visual literacy.

ROBIN BAKER
Ravensbourne College of Design & Communication

FARIBA FARSHAD
The London Institute
65 Davis Street
London W1Y 2DA
UNITED KINGDOM
itrdu@linst.ac.uk

2:30 - 4 pm

CAL

Workshop

w

Graphics in a Flash: An Introduction to Vector-Based Web Graphics



Hands-on experience with one of the most widely used technologies for Web graphics (Macromedia Flash) and how educators can use it to create interactive graphic content for the Web.

JAMES L. MOHLER
Purdue University
1419 Knoy Hall, Room 363
West Lafayette, Indiana 47907-1419 USA
james_mohler@siggraph.org

3 - 4 pm

Room 502B

Panel

sfx

Teaching Computer Animation for Results!

Learning (or teaching) computer animation depends on knowing what to emphasize and what to put on the back burner. This session shares solid approaches at three levels (foundation, undergraduate, and graduate) for teaching animation along with examples of successful student results.

KEVIN GEIGER
California Institute of the Arts

JIM McCAMPBELL
Ringling School of Art & Design

CRAIG CALDWELL
Media Arts Department
University of Arizona
P. O. Box 210076
Tucson, Arizona 85721USA
craig@u.arizona.edu

4:30 - 6 pm

Room 503

Forum

w

The Promise of the Web for Learning

Attendees and panelists explore the future of Web technologies and their promise for learning.

COLLEEN CASE
SUSAN LUPO
Schoolcraft College
18600 Haggerty Road
Livonia, Michigan 48152 USA
ccase@schoolcraft.cc.mi.us

NASA AMES RESEARCH

PURDUE UNIVERSITY

IBM

FLORIDA INTERNATIONAL UNIVERSITY

THE ROYAL INSTITUTE OF TECHNOLOGY

8:30 - 9 am

Room 505

Paper

Rich Resources for Computer Graphics Educators

Demonstration programs have a long and storied history in computer science education, particularly computer graphics. Displays are often worth more than the proverbial thousand words. This paper presents a suite of graphics tutorials, discusses their pedagogical role in computer graphics education, and places them in context with similar sets.

DAVID B. LEVINE
St. Bonaventure University

DALTON R. HUNKINS
Computer Science Department
St. Bonaventure University
St. Bonaventure, New York 14778 USA
hunkins@cs.sbu.edu

8:30 - 10 am

Room 503

Forum

Studio Views on Demo Tapes

Attendees and panelists discuss how to prepare for professional roles in digital production studios.

GLENN CAMPBELL
Area 51

ART DURINSKI
Otis College of Art and Design

TOM LEESER
Rhythm & Hues
2456 Green Valley Road
Los Angeles, California 90046 USA

BRAD REINKE
Cinesite

9:15 - 9:45 am

Room 505

Paper

CyberMath: Exploring Open Issues in VR-Based Education

Virtual reality can be an effective way to teach difficult concepts, but important questions related to immersion, collaboration, and realism remain to be answered. This paper describes CyberMath, a shared virtual environment for mathematics education.

AMBJORN NAEVE
GUSTAV TAXEN
Center for User-Oriented IT Design
The Royal Institute of Technology
Lindstedtsvogen 5
S-100 44 Stockholm, SWEDEN
gustavt@nada.kth.se

10:30 - 11 am

Room 505

Paper

From Pixels to Scene Graphs: The Evolution of Computer Graphics Courses

How do educators adjust to the advances in graphics technology? This paper outlines a proposed introductory course that blends 2D and 3D topics and addresses trends in the computer graphics industry.

DENNIS J. BOUVIER
University of Houston-Clear Lake
2700 Bay Area Boulevard
Houston, Texas 77058 USA
djb@acm.org

10:30 am - 12:30 pm

CAL

Workshop



Adventures in Modeling: Building Systems With StarLogo

In the Adventures in Modeling project, learners use StarLogo to design, create, and analyze their own models of complex, dynamic systems. Off-screen activities provide another way to connect abstract scientific systems to personal experience.

VANESSA COLELLA
MITCHEL RESNICK
Massachusetts Institute of Technology

ERIC KLOPPER
Education Program
77 Massachusetts Avenue
MIT Building 7-337
Cambridge, Massachusetts 02139 USA
klopper@mit.edu

1 - 2:30 pm

Room 503

Forum

The Teaching of Computer Graphics in a Computer Science Curriculum

Attendees-panelists dialogue on the process of teaching computer graphics in a computer science curriculum.

STEVE CUNNINGHAM
California State University, Stanislaus
ST. BONAVENTURE UNIVERSITY
UNIVERSITY OF HOUSTON-CLEAR LAKE

3 - 4 pm

Room 502B

Closing Session

Educators Program "Ramp-Out" to SIGGRAPH 2002

An opportunity for attendees to help shape the SIGGRAPH Education Committee's year-round offerings and the SIGGRAPH 2002 Educators Program.

JAMES L. MOHLER
SIGGRAPH 2002 Educators Program Chair
Purdue University
1419 Knoy Hall, Room 363
West Lafayette, Indiana 47907-1419 USA
educators-2002@siggraph.org

MIKE MCGRATH
Colorado School of Mines
ACM SIGGRAPH Director for Education

Art Gallery: N-Space

Experience a world-renowned exhibition of digitally based and inspired artwork. Via N-Space, viewers travel to places where ideas and expression are rich, and artistic freedom is unconstrained by dimension. The art embodies thoughts that go beyond labels into an unlimited digital frontier, beyond the medium to a place where it acts as a conduit for the message.

Participate in Art Ncounters, hour-long guided interactions through the N-Space Art Gallery.

Chair

DENA EBER
Bowling Green State University

86

Location

Art Gallery
Concourse Foyer
Art Gallery Theater
Room 153A/B
Art Ncounters
Meet at entrance of Art Gallery
Art Gallery Performances
Room 405

Days & Hours

Sunday, 12 August
4 - 7 pm
Monday, 13 August
9 am - 6 pm
Tuesday, 14 August
9 am - 6 pm
Wednesday, 15 August
9 am - 6 pm
Thursday, 16 August
9 am - 6 pm
Friday, 17 August
9 am - 1 pm

Committee

LESLIE BALKANY
Ackland Art Museum
University of North Carolina at Chapel Hill

HEATHER ELLIOT
Bowling Green State University

SUE GOLLIFER
University of Brighton

CHRIS S. JOHNSON
Northern Arizona University

CAROL LAFAYETTE
Texas A&M University

RICHARD MAY
Battelle Memorial Institute and University of Washington

BONNIE MITCHELL
Bowling Green State University

AMY MORIE
Mia Lehrer + Associates

KAREN SULLIVAN
SIGGRAPH 2002 Art Gallery Chair
Ringling School of Art and Design

NOAH WARDRIE-FRUIIN
New York University

Administrative Assistant

JILL PARETI
Bowling Green State University

Art Gallery Jury

TAMMY KNIPP
Florida Atlantic University

BARBARA NESSIM
Parsons School of Design
New School University

KAREN SULLIVAN
SIGGRAPH 2002 Art Gallery Chair
Ringling School of Art and Design

JOAN TRUCKENBROD
The School of the Art Institute of Chicago

PETER VOCI
New York Institute of Technology

Art & Culture Papers Reviewers
MARK BERNSTEIN
JOHANNA DRUCKER
DENA EBER
MARJORIE LUESEBRI
MICHAEL MATEAS
REBECCA ROSS
PHOEBE SENGERS
EUGENE THACKER
NOAH WARDRIE-FRUIIN

ArtSite Reviewers

IAN GWILT
MACHIKO KUSAHARA
NIRANJAN RAJAH
ANNETTE WEINTRAUB

Art Gallery Promotional Video

AARON HALIFAX
PAUL JONSON
THOMAS MACLEAN
KEVIN ZEVCHIK

Web Site Development

MICHAEL CARPENTER
KC DUNSTAN
THOMAS MACLEAN
TONY VOLPE

Treasure Map

CAROL LAFAYETTE
Art Direction

CHRISTINA GARCIA
Design

BARBARA ELLISON
Research

Art Gallery Theater Schedule

Animation & Video Works also 4 - 7 pm, Sunday, 12 August, Room 153 A/B

AUGUST

M 13

T 14

W 15

T 16

F 17

**Room 153A/B
9 - 11 am**

Art Discussion
Erasing Boundaries: Intermedia Art
in the Digital Culture
Discussants
PAUL HERTZ *Co-Chair*
Northwestern University
JACK OX *Co-Chair*
Leonardo
INA BLOM
University of Oslo
ANDREA POLLI
Columbia College Chicago

Art Discussion
The Pixel/The Line: Approaches to
Interactive Text
Discussants
NOAH WARDRIP-FRUIIN *Moderator*
JOHN CAYLEY
University of London
NICK MONTFORT
BILL SEAMAN
University of California, Los Angeles
STEPHANIE STRICKLAND
Boise State University
CAMILLE UTTERBACK
New York University

**Animation &
Video Works**

**Animation &
Video Works**

**Animation &
Video Works**

**Room 153A/B
11 am - noon**

Art and Culture Papers
Cybernetic Arts:
- Metaphoric Networks in
"Lexia to Perplexia"
- notime: Identity and Collaboration
- Art in the Information Age:
Technology and Conceptual Art
Discussants
N. KATHERINE HAYLES
University of California, Los Angeles
VICTORIA VESNA
University of California, Los Angeles
EDWARD A. SHANKEN
Duke University

Art and Culture Papers
Narrative Games:
- A Preliminary Poetics for Interactive
Drama and Games
- Rethinking Agency and Immersion:
Videogames as a Means of
Consciousness Raising
- Towards Computer Game Studies
Discussants
MICHAEL MATEAS
Carnegie Mellon University
GONZALO FRASCA
Georgia Institute of Technology
MARKKU ESKELINEN
Provosoft

**Animation &
Video Works**

**Animation &
Video Works**

**Animation &
Video Works**

**Room 153A/B
1:30 - 3 pm**

Art Talks
Layers
Discussants
ANNA URSYN, *Chair*
University of Northern Colorado
JESSICA MALONEY
TINA BELL VANCE
Bowling Green State University
CYNTHIA BETH RUBIN
Rhode Island School of Design
JAMES FAURE WALKER
Kingston University

Art Talks
Embodied Spaces
Discussants
ANNA URSYN, *Chair*
University of Northern Colorado
EMILY BLAIR
Next Question
DIANE FENSTER
Bete-Noir Studio
TAMMY KNIPP
Florida Atlantic University
REJANE SPITZ
Pontificia Universidade Católica
do Rio de Janeiro

Art Talks
Moving Images
Discussants
ELLEN SANDOR, *Chair*
(art)ⁿ
MICHAEL O'ROURKE
Pratt Institute
ANDRUID KERNE
Creating Media/
Tufts University
MICHAEL RODEMER
JIM MASON
The Long Now
Foundation

Art Talks
Translations Pictured
Discussants
ELLEN SANDOR, *Chair*
(art)ⁿ
KENNETH A. HUFF
PHILLIP GEORGE
MELISSA HARSHMAN
University of Georgia
IAN GWILT
Wanganui Polytechnic

**Room 153A/B
3 - 4 pm**

**Animation &
Video Works**

**Animation &
Video Works**

**Animation &
Video Works**

**Animation &
Video Works**

**Room 153A/B
4:30 - 6 pm**

Art and Culture Papers
Conversation Agents:
- Dialogue With a Monologue: Voice Chips
and the Products of Abstract Speech
- What Does a Very Large-Scale Conversation
Look Like?
- Schizophrenia and Narrative in Artificial Agents
Discussants
NATALIE JEREMIENKO
New York University
WARREN SACK
University of California, Berkeley
PHOEBE SENGERS
Institut für Medienkommunikation

**Animation &
Video Works**

**Animation &
Video Works**

**Performances
Room 405**

**Artificial Paradise
10 am, noon, 2 pm**

**Chaotic Robic Synesthesia
10 am, noon, 2 pm**

**Intuitive Ocusonics
10 am, noon, 2 pm**

**That Brain Wave Chick V
10 am, noon, 2 pm**

**Art Ncounters
Art Gallery Entrance**

9:30 & 11 am, 2:30 & 4 pm
Also 4:15 & 5:45 pm, Sunday, 12 August

10 & 11:30 am, 2 & 3:30 pm

9:30 & 11 am,
2:30 & 4 pm

9:30 & 11 am

Art in the Information Age: Technology and Conceptual Art

EDWARD A. SHANKEN
Department of Art & Art History
112 East Duke Building
Duke University, Box 90764
Durham, North Carolina 27708-0764 USA
+1.919.684.2224
+1.919.684.4398 fax
giftwrap@duke.com

This paper challenges disciplinary boundaries that obscure significant parallels between conceptual art and art and technology. Correspondences shared by these artistic tendencies offer grounds for rethinking the relationship between them as part of larger social transformations from the machine age of industrial society to the information age of post-industrial society.

Dialogue With a Monologue: Voice Chips and the Products of Abstract Speech

NATALIE JERMIJENKO
Center for Advanced Technology
New York University
710 Broadway, 12th Floor
New York, New York USA 10003
+1.212.998.3382
+1.212.995.4122 fax
nat@cat.nyu.edu

This survey of the use of voice chips in consumer products and a competition for speech recognition interfaces to existing products demonstrates what we can learn from listening to our products and ourselves talking to them.

Metaphoric Networks in "Lexia to Perplexia"

N. KATHERINE HAYLES
English Department
University of California, Los Angeles
Los Angeles, California 90095 USA
+1.310.835.3534
hayles@humnet.ucla.edu

Talan Memmott's "Lexia to Perplexia" reveals the co-originary status of subjectivity and electronic technologies. Instead of technologies being created by humans, this work imagines digital technology as present from the beginning, with subjects and technologies producing each other through multiple recursive loops.

notime: Identity and Collaboration

VICTORIA VESNA
Department of Design | Media Arts
University of California, Los Angeles
1300 Dickson Art Place
Los Angeles, California 90095 USA
+1.310.825.0925
vv@ucla.edu

This essay elaborates on conceptualization and development of a large networked art work: "notime". Although it describes the piece, it focuses mainly on the issues that inspired the project, the ideas that informed it, and the shifting meaning of collaboration.

The Pleasures of Immersion and Engagement: Schemas, Scripts, and the Fifth Business

J. YELLOWLEES DOUGLAS
Department of English
University of Florida
Gainesville, Florida 32611 USA
+1.352.392.0777 x301
jdouglas@nwe.ufl.edu

This essay, presented at the ACM Hypertext Conference, is the basis for an ongoing consideration of the aesthetic, cognitive, and design principles involving interactive narratives, games, and fiction.

A Preliminary Poetics for Interactive Drama and Games

MICHAEL MATEAS
Carnegie Mellon University
Computer Science Department
5000 Forbes Avenue
Pittsburgh, Pennsylvania 15213 USA
+1.412.268.3070
+1.412.268.5576 fax
michaelm@cs.cmu.edu

A theory of interactive drama that combines Aristotle's analytic categories with those of Janet Murray.

Rethinking Agency and Immersion: Videogames as a Means of Consciousness-Raising

GONZALO FRASCA
Georgia Institute of Technology
710 Peachtree Street North East #404
Atlanta, Georgia 30308 USA
+1.404.575.5614
frasca@jacaranda.org

This paper proposes a modified version of "The Sims" that would allow players to create behavioral rules for their characters that reflect their personal opinions. Like in Boal's Forum Theater, this game would foster critical discussion about social and personal problems.

Schizophrenia and Narrative in Artificial Agents

PHOEBE SENGERS
Media Arts Research Studies
Institut für Medienkommunikation
GMD Forschungszentrum
Informationstechnik GmbH
Schloss Birlinghoven
D-53754 Sankt Augustin, GERMANY
phoebe.sengers@gmd.de

This paper explores what it means for an agent to be designed and built with respect to a socio-cultural environment. It terms this way of doing AI "socially situated AI," differentiates it from the approaches taken in classical and alternative AI, and assesses its impact.

Thick & Thin: "Direct Manipulation" & The Spatial Regimes of Human-Computer Interaction

TERRY HARPOLD
Department of English
4008 Turlington Hall
University of Florida
Gainesville, Florida 32611-7310 USA
+1.352.392.6650 x 282
tharpold@acm.org

A discussion of representation of space in interactive games.

Towards Computer Game Studies

MARKKU ESKELINEN
Provosoft
PL 276, 00531
Helsinki, FINLAND
+358.9.7734495
markku.eskelinen@kolumbus.fi

What Does A Very Large-Scale Conversation Look Like?

WARREN SACK
University of California, Berkeley
SIMS
314 South Hall
Berkeley, California 94720-4600 USA
+1.510.643.3904
sack@sim.berkeley.edu

What does a conversation look like? This paper examines existing and emerging work on visualizing online conversations.

Erasing Boundaries: Intermedia Art in the Digital Age

Examination of the historical concept of intermedia (cross-modal multimedia composition), compositional methods and processes for creating intermedia, issues of sense perception and sensory coupling in the reception of intermedia, and the implications of digital multimedia, real-time performance, and interaction for future development of intermedia.

Discussants

PAUL HERTZ *Co-Chair*
Northwestern University
1890 Maple Avenue, Suite 175
The Collaboratory Project
Evanston, Illinois 60201 USA
+1.847.467.2443
+1.847.467.7885 fax
paul-hertz@northwestern.edu

JACK OX *Co-Chair*
Leonardo

INA BLOM
University of Oslo

ANDREA POLLI
Columbia College Chicago

The Pixel/The Line: Approaches to Interactive Text

This panel brings together five experts on responsive text. Their theoretical and applied presentations demonstrating techniques ranging from direct manipulation through artificial intelligence and draw on the insights of various fields, from visual art through literature.

Discussants

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NICK MONTFORT

BILL SEAMAN
University of California, Los Angeles

STEPHANIE STRICKLAND
Boise State University

CAMILLE UTTERBACK
New York University

Layers

ANNA URSYN *Chair*
CYNTHIA BETH RUBIN
TINA BELL VANCE
JAMES FAURE WALKER
JESSICA MALONEY

Layers of imagery and meaning – past and present, fragmentary, distorted, reclaimed – converge in the work of these artists. This panel discusses layers both in work process and the resulting prints.

Embodied Spaces

ANNA URSYN *Chair*
EMILY BLAIR
DIANE FENSTER
TAMMY KNIPP
REJANE SPITZ

Through the creation of expressive spaces, these artists allow us to explore where we could not otherwise reach: from the thoughts of women in distant cities, to the place where the Internet and a country converge, to the chopping-block.

Moving Images

ELLEN SANDOR *Chair*
MICHAEL O'ROURKE
ANDRUID KERNE
MICHAEL RHODEMER
JAMES MASON

Data-driven puppets, algorithmically-generated collages, a dynamic mural, explorations of a distant space – this panel explores the moving image beyond the frames of television, film, the browser, and the animated graph.

Translations Pictured

ELLEN SANDOR *Chair*
KEN HUFF
PHILIP GEORGE
MELISSA HARSHMAN
IAN GWILT

These artists have translated into pictures interface elements, crop patterns, dictionary illustrations, and passing that is not time – creating image planes that call out to other contexts within them.

Boite Noire

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Icky Flix: The Residents

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Indefinable Moods

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infection

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**Faisons Les Zigopattes!
Let's Do the Zigopattes!
For the European Gathering of
Young Digital Creation
(Rencontres Europeennes de la
Jeune Creation Numerique)**

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Loading Animated Version

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Ojo Por Ojo

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Second Thoughts

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Yuki: The Spirit of the Snow

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Altzero 3

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**CollageMachine: A Streaming
Collage Browser Learns While
You Surf**

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My Language

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The Floating Words

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Gemotion

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Invisible Places

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NAFTA Stock Puppets

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Netizens, Net-fringers and Outsiders

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New York Mural: #2, for SIGGRAPH

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Omnipresence Version #4

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Poem Vacuum Cleaner

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Protrude, Flow

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Secrets of the Magdalen Laundries

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Telomeres Project On Imminent Immortality

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Interactive Programs

Of Shifting Shadows

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Texas Moments

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Artificial Paradises

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Artificial Paradises, the first total system for cross-media data generation, reworks the computer as a symphonic balletic environment system (as a body without organs).

Chaotic Robotic Synesthesia

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Synesthesia explores sense sharing. The music is propelled by mixing colors and sharing frequencies. Forging tactile, aural, and visual perception between humans and in collaboration with technology asks questions that can yield ways of better understanding, seeing, and hearing natural order.

Intuitive Ocusonics

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Intuitive Ocusonics is a live, in-person sound performance generated by eye tracking instruments.

That Brain Wave Chick V

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This project includes three 30-minute concert performances of a collaborative brain-wave music composition by Mark Applebaum and Paras Kaul. Performances are presented over a two-day period, in conjunction with a week-long neural music exhibit.

VR Keith 2.0

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VR Keith 2.0 explores the interface among interaction, performance, and avatars. Using comedy, irony, and cheesy quotes from cultural theorists, etc. VR Keith interacts directly with the gallery audience and argues how much better virtual and robotic humans are than real ones.

The Smoker

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Proximal Actuator

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- **Rebirth of the VooDoo Child**

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- **F-G and the Iron Clocks of Film**

- **Global Coffee**

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- **HellFire III**

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- **Intercere #11**

- **Intercere #17**

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- **Whitewater**

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- **angst in the land of frozen syllables**

- **courage**

- **one foot**

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- **A Piece of the Pie**

- **Breast Stroke**

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- **Transport III**

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- **Six-Part Pattern Series:**

2000.3; 2000.5; 2000.6;

- **2000.12a and 2000.12b**

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Spirolaterals

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- **Disoriented but not Confused**

- **Undefined**

- **Ask Yourself**

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- **Don't Say Goodbye (Variation 1)**

- **Used Chambers**

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- **Blue Suspension, Detail 2**

- **Tentacular Continuum, Detail 3**

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The Keys**

- **If These Walls Could Talk:
Bubby's Story**

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- **Old House in the Shadow of the Castle**

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- **Xrossings: Tidal Pool**

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- **Sarah-Dancing Reflections**

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- **What Noh Masks Whisper
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- **Commuter's Tunes**

- **Moonlit Manifestation**

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- **Overgrown Artificiality 9**

- **Overgrown Artificiality 10**

- **Overgrown Artificiality 11**

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- **Entering the Event Horizon**

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- **Manufactured Existence:
The Remains**

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Computer Animation Festival 2001: A Digital Odyssey

The world's most prestigious film and video extravaganza, showcasing dazzling and innovative imagery in invited and submitted works selected by a distinguished jury of computer graphics experts and specialists. The works selected for this year's Computer Animation Festival take us on a remarkable journey that combines the talent and brilliance of current and future trends in art and science with the very best imagery depicting comedy, drama, romance, action, adventure, fantasy, science fiction, and science fact. Selections are presented in a multiplex format of daily screenings in three Animation Theaters, and in the Electronic Theater matinée and evening shows at the Shrine Auditorium.

Chair

SANDE SCOREDOS
Sony Pictures Imageworks Inc.

95

Location

Electronic Theater
Shrine Auditorium

Days & Hours

Monday, 13 August
7 - 9 pm
Tuesday, 14 August
2 - 4 pm & 7 - 9 pm
Wednesday, 15 August
2 - 4 pm & 7 - 9 pm
Thursday, 16 August
7 - 9 pm

Location

Animation Theaters
Rooms 409, 411, 501

Days & Hours

Sunday, 12 August
3 - 7 pm
Monday, 13 August through
Thursday 16 August
9 am - 6 pm
Friday, 17 August
9 - 3 pm

Committee

NICK BALI
Database Director
Sony Pictures Imageworks Inc.

JACQUIE BARNBROOK
Electronic Theater Producer
Sony Pictures Imageworks Inc.

PAUL DEBEVEC
Technology Director
USC Institute for Creative
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SHEENA DUGGAL
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Sony Pictures Imageworks Inc.

ROB ENGLE
Pre-show Director
Sony Pictures Imageworks Inc.

MARK HALL
Volunteer Staffing Director
Sony Pictures Imageworks Inc.

PAM HOGARTH
Outreach Director
Gnomon School of Visual Effects

JOHN MCINTOSH
SIGGRAPH 2002 Computer
Animation Festival Chair
School of Visual Arts

LADD MCPARTLAND
Film Editor
Industrial Light + Magic

JILL SMOLIN
Animation Theater Director
Cinesite

JANE STEPHAN
Animation Theater Director
Rhythm & Hues Studios

ERIC WITHEE
Festival Coordinator
Sony Pictures Imageworks Inc.

Jury

BRIAN BLAU
Discreet

JEREMY CANTOR
Sony Pictures Imageworks Inc.

RICHARD CHUANG
PDI/DreamWorks

PAUL DEBEVEC
USC Institute for Creative
Technologies

ANDREW GLASSNER
Writer and Consultant

STEVE GOLDBERG
Walt Disney Feature Animation

THOMAS HOLLIER
Sony Pictures Imageworks Inc.

LADD MCPARTLAND
Industrial Light + Magic

Alternates

JACQUELYN FORD MORIE
USC Institute for Creative
Technologies

TIME SKELLY
Design Happy

	Features	Length
Action & Adventure	Wild Jungle – Motion Ride	3:45
	Metal Gear Solid 2 Sons of Liberty	10:07
	Master Q	3:30
	Stop Motion vs. Computer Animation	:44
	Oddworld: Munch's Oddysee, SIGGRAPH Teaser	6:53
	Time Out	1:10
	Cartoon Network's "Quick Draw El Kabong"	1:57
	Microsoft Xbox "Two to Tango"	1:36
Art & Musicals	Iomega "Pool"	:44
	ManHang	4:56
	Early Light	7:35
	Ojo Por Ojo	2:24
	Our Lady Peace "In Repair"/Bitcasters	4:17
	Kent – Tout Est La	2:57
	Vel Satis en Capital	5:42
	Wardrobe	2:02
Comedy 1	Robbie Williams "Let Love Be Your Energy"	6:32
	Ericsson "Lines"	:43
	Ricky Martin, "Private Emotion"	4:00
	When Wolfy Met Helga	1:25
	Puppet	2:25
	O Brother, Where Art Thou?	1:56
	Walk	5:35
	Moving Pyramid	9:38
Comedy 2	Lunch	3:14
	Trick or Treats	5:18
	AP 2000	8:11
	Comics Trip	6:04
	Kami	6:37
	Tabasco Commercials	1:10
	Turing Test	5:27
	Hubert's Brain	1:15
Documentary	Steam Punk "Go Round"	1:00
	Hessi James	4:56
	Computer Reconstruction: Temple Site at Phimai	3:22
	Elmo's World: Digital Puppetry on Sesame Street	2:49
	Considering an Exotic Pet?	:40
	Synthesizing Sounds From Physically Based Motion	1:15
	DAB: Interactive Haptic Painting With 3D Virtual Brushes	5:38
	Desert H2Ouse	1:58
Drama 1	Capitol Zoom	1:45
	New Baiyun International Airport, Guangzhou City, China	4:56
	Wing 2001	1:37
	Courthouse With Curved Elements	3:04
	Book of Poosh	5:00
	Lunch	1:25
	Le Processus	7:51
	Serenade	2:49
Drama 2	"SAE" (A Bird)	13:10
	Perestroika	2:22
	Big One That Got Away	2:50
	L'enfant De La Haute Mer	7:00
	Grandma	4:12
	Silhouette	3:03
	Platonic Chin	4:00
	Pasta for War	3:27
SciFi & SciFact 1	Modeling & Animation Reel	1:58
	L'autre Temps	5:30
	Coca Cola "Clay Dolls"	:39
	Harvey	9:32
	Exit	1:51
	f8	11:40
	Hollow Man	3:22
	New World Computing Cinematic Team	6:33
SciFi & SciFact 2	ZOIDS	4:00
	In the Body	1:26
	Horses on Mars	6:56
	Freeware	6:56
	Exploring Serotonin in the GI Tract	2:53
	Oblivious	:47
	Knitwear Rendering	2:47
	X-Men: Mystique Transformations	1:24
	Antarctica: A Flying Tour of the Frozen Continent	4:59
	Evolution of the Universe: Large-Scale	
	– Structure and Galaxy Formation	1:06
	– Structure and Galaxy Formation	1:06

Theater One

Room 501

3:00	Comedy 1
3:37	Drama 1
4:15	Art & Musicals
4:56	SciFi & SciFact 1
5:23	Action & Adventure
5:53	Documentary
6:25	Drama 2

Theater Two

Room 411

3:00	Comedy 2
3:26	SciFi & SciFact 1
3:53	Drama 1
4:30	Art & Musicals
5:12	Documentary
5:44	Action & Adventure
6:14	Comedy 1

Theater Three

Room 409

3:00	Drama 1
3:37	Documentary
4:09	Action & Adventure
4:39	Drama 2
5:14	Comedy 2
5:40	Art & Musicals
6:21	SciFi & SciFact 2

Theater One

Room 501

9:00	Drama 1
9:37	Comedy 1
10:15	SciFi & SciFact 2
10:42	Art & Musicals
11:24	Action & Adventure
11:54	Comedy 2
12:21	Drama 2
12:55	SciFi & SciFact 1
1:22	Documentary
1:54	Comedy 1
2:31	Drama 2
3:06	Art & Musicals
3:47	Action & Adventure
4:17	Comedy 2
4:44	SciFi & SciFact 2
5:12	SciFi & SciFact 1

Theater Two

Room 411

9:00	Comedy 1
9:37	Action & Adventure
10:08	Drama 2
10:42	Drama 1
11:19	SciFi & SciFact 1
11:46	Art & Musicals
12:27	Documentary
1:00	SciFi & SciFact 2
1:27	Drama 2
2:02	Action & Adventure
2:32	Comedy 2
2:58	SciFi & SciFact 2
3:26	Drama 1
4:04	SciFi & SciFact 1
4:31	Documentary
5:03	Art & Musicals

Theater Three

Room 409

9:00	SciFi & SciFact 1
9:27	Drama 1
10:04	Action & Adventure
10:34	Comedy 1
11:12	Art & Musicals
11:53	Comedy 2
12:20	SciFi & SciFact 2
12:48	Documentary
1:20	SciFi & SciFact 1
1:47	Drama 2
2:21	Art & Musicals
3:02	Action & Adventure
3:32	SciFi & SciFact 2
4:00	Drama 2
4:34	Comedy 2
5:01	Documentary
5:33	SciFi & SciFact 1

Theater One**Room 501**

9:00 Action & Adventure
 9:30 Drama 2
 10:04 Art & Musicals
 10:45 Comedy 1
 11:23 Documentary
 11:55 SciFi & SciFact 2
 12:23 Drama 1
 1:00 Comedy 2
 1:27 SciFi & SciFact 1
 1:54 Documentary
 2:26 Drama 2
 3:00 Comedy 1
 3:38 Action & Adventure
 4:08 Art & Musicals
 4:49 Drama 1
 5:27 SciFi & SciFact 1

Theater Two**Room 411**

9:00 Art & Musicals
 9:41 Documentary
 10:13 SciFi & SciFact 1
 10:40 Comedy 2
 11:06 SciFi & SciFact 2
 11:34 Drama 2
 12:08 Action & Adventure
 12:39 Comedy 1
 1:16 Drama 1
 1:54 Documentary
 2:26 Art & Musicals
 3:07 SciFi & SciFact 2
 3:35 Comedy 2
 4:01 Drama 2
 4:35 Action & Adventure
 5:06 SciFi & SciFact 1

Theater Three**Room 409**

9:00 Drama 1
 9:37 Comedy 2
 10:03 SciFi & SciFact 2
 10:31 Art & Musicals
 11:12 Action & Adventure
 11:43 SciFi & SciFact 1
 12:10 Comedy 1
 12:48 Documentary
 1:20 SciFi & SciFact 2
 1:47 Drama 2
 2:22 Drama 1
 2:59 Comedy 2
 3:26 SciFi & SciFact 1
 3:53 Comedy 1
 4:30 Documentary
 5:02 Action & Adventure

Theater One**Room 501**

9:00 SciFi & SciFact 2
 9:27 Art & Musicals
 10:08 Comedy 1
 10:46 Drama 2
 11:20 Documentary
 11:52 Drama 1
 12:30 Action & Adventure
 1:00 SciFi & SciFact 1
 1:27 SciFi & SciFact 2
 1:55 Comedy 1
 2:33 Drama 2
 3:07 Action & Adventure
 3:37 Comedy 2
 4:04 Art & Musicals
 4:45 Drama 2
 5:19 SciFi & SciFact 1

Theater Two**Room 411**

9:00 Documentary
 9:32 Comedy 1
 10:09 Action & Adventure
 10:40 SciFi & SciFact 1
 11:07 Drama 1
 11:44 Art & Musicals
 12:25 SciFi & SciFact 2
 12:53 Drama 2
 1:27 Comedy 2
 1:54 Drama 1
 2:31 Art & Musicals
 3:12 Action & Adventure
 3:43 SciFi & SciFact 1
 4:10 Comedy 1
 4:48 Documentary
 5:20 Drama 1

Theater Three**Room 409**

9:00 Action & Adventure
 9:30 Art & Musicals
 10:11 Drama 1
 10:49 Comedy 2
 11:15 Drama 2
 11:49 Comedy 1
 12:27 Documentary
 12:59 SciFi & SciFact 1
 1:26 Comedy 1
 2:04 Action & Adventure
 2:34 SciFi & SciFact 2
 3:02 Drama 1
 3:39 Art & Musicals
 4:21 Comedy 2
 4:47 Drama 2
 5:21 SciFi & SciFact 1

Theater One**Room 501**

9:00 Comedy 1
 9:37 Action & Adventure
 10:08 Drama 2
 10:42 Drama 1
 11:19 SciFi & SciFact 1
 11:46 Comedy 2
 12:13 Documentary
 12:45 SciFi & SciFact 2
 1:13 Drama 2
 1:47 Action & Adventure
 2:17 Art & Musicals
 2:58 Comedy 1
 3:36 Drama 1
 4:14 SciFi & SciFact 1
 4:41 Comedy 2
 5:07 Documentary

Theater Two**Room 411**

9:00 SciFi & SciFact 1
 9:27 Comedy 2
 9:53 SciFi & SciFact 2
 10:21 Art & Musicals
 11:02 Drama 1
 11:39 SciFi & SciFact 1
 12:06 Comedy 1
 12:44 Documentary
 1:16 SciFi & SciFact 2
 1:44 Drama 2
 2:18 Drama 1
 2:56 Comedy 2
 3:22 Action & Adventure
 3:53 Comedy 1
 4:30 Art & Musicals
 5:11 Documentary

Theater Three**Room 409**

9:00 Action & Adventure
 9:30 Drama 2
 10:04 Art & Musicals
 10:45 Comedy 1
 11:23 Documentary
 11:55 SciFi & SciFact 2
 12:23 Action & Adventure
 12:53 Comedy 2
 1:20 SciFi & SciFact 1
 1:47 Documentary
 2:19 Drama 2
 2:53 Comedy 1
 3:31 SciFi & SciFact 2
 3:59 Art & Musicals
 4:40 SciFi & SciFact 2
 5:07 Drama 1

Theater One**Room 501**

9:00 SciFi & SciFact 2
 9:27 Drama 1
 10:05 Comedy 2
 10:31 SciFi & SciFact 1
 10:58 Documentary
 11:30 Drama 2
 12:05 Comedy 1
 12:42 Action & Adventure
 1:13 Art & Musicals
 1:54 Documentary
 2:26 SciFi & SciFact 2

Theater Two**Room 411**

9:00 Drama 2
 9:34 Action & Adventure
 10:04 Comedy 1
 10:42 Drama 1
 11:19 Documentary
 11:51 Art & Musicals
 12:32 SciFi & SciFact 2
 1:00 Comedy 2
 1:27 Documentary
 1:59 Drama 1
 2:36 Drama 2

Theater Three**Room 409**

9:00 Art & Musicals
 9:41 Comedy 2
 10:07 SciFi & SciFact 2
 10:35 Documentary
 11:07 SciFi & SciFact 1
 11:34 Drama 2
 12:08 Art & Musicals
 12:49 Action & Adventure
 1:20 SciFi & SciFact 2
 1:48 Drama 2
 2:22 Comedy 2

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● **Budweiser "Come Home"**

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Distrust of Romantica

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Evolution of the Universe: Large-scale Structure and Galaxy Formation

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Final Fantasy - The Spirits Within

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Garden of the Metal

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Grandma

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Hollow Man

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Horses on Mars

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Hubert's Brain

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Ice Age

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● In the Body

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yves@ilm.com

● Instant-Animator Machine, The

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● Iomega "Pool"

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eulbrich@d2.com

● Kami

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● Knitwear Rendering

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Ricky Martin: "Private Emotion"

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Rule-Based Dynamic Simulation for "Wave of Death"

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Say Cheese

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The Search for Infinity

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Sequence From "Monsters, Inc."

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Emerging Technologies

Emerging Technologies celebrates not only the technology we develop to play, but also the play we all enjoy in exploring the challenge of continually advancing the field, inventing entirely new archetypes, and tackling design issues. From lab prototypes to student research projects and industry beta tests, Emerging Technologies allows you to get your hands on, and your head around, some truly unique visions of the future of technology, as well as some solid examples of the state of art right now. Everything from display systems to interfaces, robotics, collaboration, simulation, music, and online applications is available for exploration.

Chair

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Concourse Hall,
Rooms 150, 151, 152

Days & Hours

Sunday, 12 August
4 - 7 pm

Monday, 13 August
9 am - 6 pm

Tuesday, 14 August
9 am - 6 pm

Wednesday, 15 August
9 am - 6 pm

Thursday, 16 August
9 am - 6 pm

Friday, 17 August
9 am - 3 pm

α wolf

Chair's Prerogative Exhibit

BILL TOMLINSON

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badger.www.media.mit.edu/people/
badger/alphaWolf.html

This installation, featuring compelling characters with a novel multi-person interface in an expressive graphical setting, allows participants to interact socially with a pack of autonomous wolves. It is an extension of previous work by the MIT Media Lab's Synthetic Characters Group on creation of autonomous virtual creatures.

Technical Innovation

- Interactive synthetic social behavior

An Interface for Touching the Interface

Juried Exhibit

TAKUYA NOJIMA

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New augmented-reality technology uses real-time sensors and a haptic display to haptize a dynamically changing real environment. In this application, the technology "touches" the interface between two liquids.

Technical Innovations

- Haptic feedback of things you can't feel
- Converting chemical boundaries into physical feedback

CircleMaze

Juried Exhibit

CLIFTON FORLINES

Carnegie Mellon University
630 Clyde Street #202
Pittsburgh, Pennsylvania 15213 USA
Forlines@cs.cmu.edu
www.etc.cmu.edu/projects/jamodrum/index.htm

An interactive musical game that encourages player communication through a shared audio-visual experience. The CircleMaze combines novel input devices with a projected tabletop. Players participate in a collaborative game and make music at the same time.

Technical Innovation

- Fun, collaborative gaming experience

Cylindrical 3D Display Observable From All Directions

Juried Exhibit

TOMOHIRO ENDO

Telecommunications Advancement
Organization of Japan
6th floor, 1-33-16, Hakusan, Bunkyo-ku
Tokyo 113-0001 JAPAN
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A cylindrical, multi-viewer display that presents 360-degree 3D images without special glasses. Because the display is based on ray-space and super-multi-view technologies, its images have smooth motion parallax.

Technical Innovation

- Unencumbered, naked-eye volumetric display

EnhancedDesk

Juried Exhibit

YOICHI SATO

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www.hci.iis.u-tokyo.ac.jp/research/index.html

This augmented desk interface system provides novel man-machine interfaces based on direct manipulation of both real and projected objects with human hands and fingers.

Technical Innovations

- User-specified object recognition
- Overlay of interactive functionality
- Fast and accurate real-time video tracking of multiple hands and fingers

Enhanced Reality: A New Frontier for Computer Entertainment

Juried Exhibit

RICHARD MARKS

Sony Computer Entertainment America
919 East Hillsdale Boulevard
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richard_marks@playstation.sony.com
www.devnet.scea.com/research/index.html

A new form of computer entertainment that enables movie-like special effects by mixing live video input and computer graphics in real time (augmented reality but with an entertainment focus). Participants interact with a virtual character, play with virtual butterflies, and have a "magic" duel.

Technical Innovations

- Intelligent natural interfaces
- Video input
- Collaborative, real-time situated awareness

Everywhere Displays

Juried Exhibit

CLAUDIO PINHANEZ

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www.research.ibm.com/people/p/pinhanez/
cp_research_ed.htm

An everywhere displays projector uses a rotating mirror to project information onto any surface in an environment. User interaction is detected by a video camera so no physical contact with any computer device is required. In this playful demonstration, an ED projector helps visitors collaboratively render an image composed of M&Ms.

Technical Innovation

- Responsive projection of information onto real world surfaces

Excerpts From Experiments in the Future of Reading

Juried Exhibit

DALE MACDONALD

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Reading changes as digital technologies allow ever-easier manipulation of forms and genres. In this display, robust, hands-on interactive reading experiences demonstrate how reading might change in the near future and encourage visitors to experience for themselves how new technologies might shape the reading experience.

Technical Innovation

- Interactive information displays for text

FEELEX

Juried Exhibit

UNIVERSITY OF TSUKUBA

Institute of Engineering Mechanics and Systems
Tsukuba 305-8573 JAPAN
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A haptic-visual display composed of a flexible screen, an actuator array, and a projector that allows viewers to touch and feel the image with their bare hands. A rubber sponge and an array of rods displays the rigidity distribution of virtual objects.

Technical Innovation

- High-resolution, unencumbered haptic-feedback device

i-ball: Interactive Information Display Like a Crystal Ball

Juried Exhibit

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www.hc.t.u-tokyo.ac.jp/i-ball/

This spherical, transparent, object-oriented spatial display captures and processes images of the observer's behavior. Like a crystal ball, it enables image communication.

Technical Innovations

- Spatial display with the illusion of depth sensation
- Gesture-based interaction with CG characters
- Gaze awareness for video conferencing

IllusionHole

Juried Exhibit

YOSHIFUMI KITAMURA
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www-human.cie.eng.osaka-u.ac.jp/~kitamura/

This interactive, stereoscopic display system allows three or more moving observers to simultaneously observe individual stereoscopic image pairs from their own viewpoints. With a simple configuration, it provides intelligible 3D stereoscopic images free of flicker and distortion.

Technical Innovations

- Collaborative
- Multiple simultaneous viewing of correct stereographic imagery
- Mixed reality

Informative Art

Juried Exhibit

TOBIAS SKOG
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www.viktoria.informatik.gu.se/groups/play/projects/slowtech/installations.html

How computer displays can be integrated into the everyday environment. Informative Art borrows from the language of traditional art to create digital displays that convey dynamic information. For example, an abstract painting indicates the amount of unread email in an office.

Technical Innovation

- Innovative way of using technology to display information

Just Follow Me: A VR-Based Motion Training System

Juried Exhibit

UNGYEON YANG
Pohang University of Science and Technology
1 San Hyoja-dong
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uyyang@postech.ac.kr

A virtual reality motion-training system based on the "ghost" metaphor.

Technical Innovation

- Interactive real-time human motion training for dance, sports, and entertainment

Meditation Chamber

Chair's Prerogative Exhibit

DIANE GROMALA
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www.gvu.gatech.edu/meditation/

Meditation and relaxation are well established as helpful in treating a variety of ailments. The Meditation Chamber demonstrates how biofeedback-driven visual, auditory, and tactile stimuli can create, guide, and maintain meditation and relaxation experiences.

Technical Innovation

- Biofeedback-based interaction

Micro Archiving

Juried Exhibit

TATSUYA SAITO
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Micro Archiving enables digital archives of small objects like insects. This application demonstrates Micro Archiving's easy acquisition of high-definition 3D models and displays an interactive environment in which visitors interact with virtual bugs.

Technical Innovation

- High-resolution digitizing of shape and color for tiny objects

Mobile Augmented Reality Systems

Juried Exhibit

STEVEN FEINER
Columbia University
500 West 120th Street, 450 CS Building
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www.cs.columbia.edu/graphics/projects/siggraph2001-etcch/

Four attendees, wearing see-through head-worn displays tracked by a wide-area, six-degrees-of-freedom tracker, interact with a shared virtual information space that documents Emerging Technologies. Two attendees are fully mobile. They can roam Emerging Technologies and switch automatically between the six-degrees-of-freedom tracker and a coarse IR position-tracking infrastructure.

Technical Innovations

- Mixed reality
- Wearable computing
- Situated awareness

Origami Desk

Chair's Prerogative Exhibit

WENDY JU
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MIT Media Lab
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Origami Desk is an interactive installation that guides participants through the creation of various origami structures. The installation utilizes several groundbreaking interaction technologies, including electric field-sensing arrays and RFID tags, to illustrate how real-world graphics, interaction design, and sensing technologies can be integrated to help users perform process-driven tasks.

Technical Innovation

- Innovative integration of sensor feedback and projection
- Custom designed sensor embedded paper

OttoAndIris.com

Chair's Prerogative Exhibit

BRYAN LOYALL

Zoesis Studios
246 Walnut Street, Suite 301
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ottoandiris.com/

A playful theme park filled with fun activities in a 3D world. The core elements of the theme park are two autonomous, real-time interactive characters with individual personalities constructed from believable-agent and interactive-drama technology developed by Zoesis Studios, a spin-off of the Oz project at Carnegie Mellon University.

Technical Innovations

- Highly interactive, personality-rich autonomous characters
- Interactive dramatic guidance
- Interactive music
- Web-based online delivery

Pirates!

Chair's Prerogative Exhibit

PETER LJUNGSTRAND

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A mobile, multi-user, context-aware computer game that runs on PDAs in a wireless network and is experienced in physical space. The game uses mobile terminals to take advantage of, and rely upon, players' mobility as an intrinsic part of the game. Unlike most computer games, the experience depends just as much on social interaction with people in the real world as on the computer-mediated game elements.

Technical Innovation

- Location sensitive, multi-user collaborative wireless game

Riding the Net

Juried Exhibit

CHRISTA SOMMERER

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In this speech-based image browser, an interactive window displays a collection of constantly updated images derived from the Internet. As users speak into voice-input devices, keywords generate downloads of corresponding images. Users can interact with the images on the window's surface.

Technical Innovations

- Voice-driven image retrieval of data mined from the Internet
- Touch-screen intervention

RobotPHONE: RUI for Interpersonal Communication

Juried Exhibit

DAIROKU SEKIGUCHI

The University of Tokyo
7-3-1 Hongo, Bunkyo-ku
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A user interface that uses robots as physical avatars for interpersonal communication. It enables users in remote locations to communicate and interact with each other by exchanging the shape and motion of the robot.

Technical Innovation

- Cooperative mechanical and interpersonal communication via robotic interfaces

sensingChair

Juried Exhibit

HONG TAN

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An office chair that senses its occupant through a layer of "artificial skin." The sensingChair opens up new opportunities for human-computer interactions.

Technical Innovations

- Chair-based HCI
- Real-time classification of seated posture

Ultra-Bright Ultra-High Resolution Reality Center

Chair's Prerogative Exhibit

ANDREW JOEL

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www.barco.com/projection_systems/
virtual_and_augmented_reality/

In this stereoscopic projection demonstration, high-resolution light-valve projectors are modified with simulation-based optimizations that are normally applied only to CRT projection. The result: A Reality Center without walls that opens up multi-channel, curved-screen stereoscopic displays to larger audiences and greater collaboration than previously possible.

Technical Innovations

- State of the art in stereoscopic light-valve projection technology
- Advanced geometry correction for curved-screen light-valve projection
- Advanced soft-edge matching for multi-channel light-valve projection

The Studio

The Studio is a "hands-on" experience for attendees who want to collaborate with advanced digital systems and each other to generate 2D and 3D creations. It is the only SIGGRAPH 2001 program where the content is created at the conference by attendees.

Artists, scientists, and engineers can walk in, create, and realize their ideas on paper.

Chair

JON CONE
Cone Editions Press, Ltd.

Location

The Studio: West Hall A

**Interactive Classroom:
CAL/The Studio Area**

Days & Hours

Sunday, 12 August
1-7 pm

Monday, 13 August
9 am - 6 pm

Tuesday, 14 August
9 am - 6 pm

Wednesday, 15 August
9 am - 6 pm

Thursday, 16 August
9 am - 6 pm

Friday, 17 August
9 am - 6 pm

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VICKI CAULFIELD
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The 2D section of The Studio is designed to introduce participants to the world of 2D output using the latest technology. When used in conjunction with the Creativity Center, the 2D section supports creation of original and unique art. Participants are invited to take full advantage of the tutorial offerings. When they are combined with the 2D section's state-of-the-art equipment and the Studio's volunteer expertise, the result is an opportunity to learn new and exciting processes and techniques.

Lenticular Imaging, 3D and Anaglyph

Lenticular prints bend light to produce the illusion of 3D, morphing, or animation. In this area, attendees work with software that allows creation of "3D" images with lenticular screens or anaglyph (red-blue glasses) techniques. They can create real-time 3D photographs and specify lenticular or anaglyph printing methods. The Creativity Center is also available for use in conjunction with this area.

Make Art

In the 2D Make Art section, digital fine art becomes a reality. Attendees are introduced to a variety of input, digital-art-creation, and output possibilities, and encouraged to create original and creative images in this digital print shop. Various scanners, image editing software, and desktop printers are available for use. The Creativity Center offers a variety of traditional media to combine with your digital print.

PiezographyBW/B&W Printing

Learn how to prepare and output amazing black-and-white prints. Attendees are introduced to techniques that take advantage of PiezographyBW, a new software-and-ink combination that allows artists and photographers to create high-resolution, large-dynamic-range black-and-white prints. Topics include: input, resolution requirements, and output options. The Creativity Center is also available for use in conjunction with this area.

Data Capture

This area offers an array of devices that scan objects of various sizes to attain 3D digital data that can be manipulated on the computer. Attendees can bring in objects to be scanned, scan themselves, or sculpt an object out of clay (in the Creativity Center) and scan that. While each scanner works a little differently, they all share the ability to create a "point cloud" of data points that describe an object in 3D space. In the computer, the points become vertices that can be connected by segments to create a "skin" or "surface" of triangles and squares that are the digital equivalent of the surface of the object that was scanned. Some scanning processes result in a very detailed digital model. Others capture only the primary features of objects. 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.). When the digital model is complete, it can be output to a rapid prototyping machine (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.

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, enabling more dynamic and intuitive creative exploration. Attendees can also try out the latest haptic modeling device, which allows for tactile feedback in the digital 3D modeling process. A completed model can be output to a rapid prototyping machine, animated with 3D animation software, or shaded, textured, rendered, and printed.

Rapid Prototyping

Rapid Prototyping (RP), or 3D printing, is an elegant and simple manufacturing process. Almost any file made with a 3D modeling package can be realized as a physical object. Any CAD model that has wall thickness or that is "solid" can be prototyped. The computer model is first digitally "sliced" into very thin layers (usually a few thousands of an inch). The RP machine then uses those slices to physically build the object layer by layer. Some machines build by sintering (melting) granules of plastic or hardening layers of epoxy, while others extrude thin layers of thermal plastic, or laminate layers of paper. Each process and material has its own interesting advantages and disadvantages, and most allow hands-on "bench work" for final finishing. RP was primarily 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 distinct advantage of rapid prototyping over all of the other automated processes is that it fabricates additively. This is a simple yet profound difference. Undercuts, convolutions of form, intricate geometry, nested forms – all are easily accomplished in an additive process.

Animation

In the Animation section of The Studio, animated ideas become reality. Attendees are introduced to various off-the shelf animation software packages (interfaces, workflow, and creation tools) via hands-on sessions and interactive tutorial presentations. Concepts include: modeling, texturing, lighting, and application of the basic principles of animation. Participants generate key frames and procedural animation to bring their creatures, characters, props, and other scene elements to life. Scene optimization and rendering techniques are also discussed to ensure efficient rendering for output to CD-ROM or Flipbook.

Creativity Center

In this vibrant, hands-on environment, attendees work with a variety of traditional media and digital imaging to sculpt 3D models, paint and sketch with traditional media, create digital transfer prints, and experiment with incorporating traditional and digital techniques in artwork.

109

Digital Collaboration Workshop

Sign up to work with international artist Hugh O'Donnell, The Studio's Collaboration Chief for one or more days and access all The Studio has to offer. Attendees can create collaborative digital productions utilizing a variety of scanning facilities, 2D, 3D, and animation. Expertise in art making and software use is not a prerequisite. Participants receive copies of their collaborative artworks whenever possible.

1 - 2 pm Interactive Classroom

Virtual Studio: Virtual Reality Learning Environments in Art

Development and demonstration of a fully immersive, interactive virtual learning environment using the Virtual Studio.

KENNETH SAKATANI
The University of the Arts
ksakatani@aol.com

DA SHAWN HALL
The University of the Arts
mstudios@bellatlantic.net

2:30 - 3 pm Interactive Classroom

The Collaborative Process

An introduction to the Digital Collaboration Workshop and collaborative creation of digital productions utilizing a variety of scanning facilities, 2D, 3D, and animation.

HUGH O'DONNELL
Boston University
hodonnell@bu.edu

3 - 4 pm Studio Floor

Breakout Session**Character Animation**

Introduction to fundamental character animation using Alias|Wavefront Maya. Topics include: basic character set up; the relationship between the root and legs of a character in a walk cycle, through timing, key framing (squash and stretch in the time line), pose-to-pose, and in-betweening; and new tricks and techniques in animating (setting a default pose, grabbing poses, moving holds, recycling poses).

MOHAMMED ALLABABIDI
Academy of Art College
mallabab@hotmail.com

DAVID RICHARD NELSON
Pixar Animation Studios
dnelson@pixar.com

4 - 4:30 pm Interactive Classroom

Artist Talk: Designer Chaos

At first sight, chaos and design seem antithetical. Yet there is an intimate connection between randomness and coherent structure. This talk explains methods based on chaotic dynamics for design of symmetric patterns and describes some practical applications of these techniques to teaching art students (some mathematics) and mathematics teachers (some art). Illustrations include examples of symmetric designs.

MIKE FIELD
University of Houston
mike@math.uh.edu

4:30 - 5 pm Interactive Classroom

Artist Talk: Lines and Plots

Algorithmic drawings with lines. A line is a basic conceptual element from which the formulation of rich expressions is possible. Lines meet each other, depart, cross over, expand, move away, and return. Lines are fascinating, and belong to a universe in their own right.

HANS DEHLINGER
Universität Gesamthochschule Kassel
dehling@uni-kassel.de

5 - 6 pm Interactive Classroom

Solid Modeling: Preparing Models for Rapid Prototyping

3D Modeling demonstration and tutorial using Rhino to build 3D objects and prepare them for rapid prototyping.

KIM VOIGT
Temple University
kimvoigt@earthlink.net

9 - 10 am Interactive Classroom

Character Animation

Acting out shots and the process of doing it in Alias|Wavefront Maya through blocking, animating and layering animation, follow through, overlap, mel scripts, and moving holds. In the end, attendees should have a good understanding of the principles of character animation, FK versus IK, joints, and hierarchy with concepts of grouping versus parenting.

MOHAMMED ALLABABIDI
Academy of Art College
mallabab@hotmail.com

9:30 - 10 am Studio Floor

Breakout Session**3D Data Capture Overview**

An overview of 3D data-capture processes and demonstration of specific scanning devices in operation in the Studio.

DAN COLLINS
Arizona State University
dan.collins@asu.edu

OSHA MAKAI SMITH
Arizona State University
omsmith@asu.edu

10 - 11 am Interactive Classroom

Strange Pixels: The Life & Times of the Dot

A profusely illustrated talk on the 15-billion-year history of the dot in imaging. After a survey of the first 14,999,999,852 years of activity, the presentation focuses on the last 149 years of dot art and science.

GLENN ZUCMAN
Artboy USA
artboy@ioc.net

11 - 11:30 am Studio Floor

Breakout Session**Rapid Prototyping Overview**

An overview of rapid-prototyping processes and explanation of RP systems in operation in the Studio.

ELONA VAN GENT
Grand Valley State University
vangente@gvsu.edu

11 am - noon Interactive Classroom

Modeling

NURBS, polygons, and subdivision surface modeling in the Alias|Wavefront Maya environment. Topics include: modeling from scratch in the digital environment, building from scanned geometry for animation, and various parameterization and creation techniques. The emphasis is on animation output.

DAVID RICHARD NELSON
Pixar Animation Studios
dnelson@pixar.com

noon - 12:30 pm Interactive Classroom

Artist Talk: Archival Evolutionary Prints

Leslie Sobel works from digital video to produce archival Epson prints using concepts from evolutionary computing to capture archetypal imagery. The subject matter for the images is highly transitory, but the resulting prints should last as long as current technology permits. She discusses both content and output.

LESLIE SOBEL
Independent
las@lesliesobel.com

12:30 - 1 pm Interactive Classroom

Artist Talk: Telomeres Project on Imminent Immortality and other Installations

Ellen Sandor (founding artist and director of (art)ⁿ), TJ McLeish, Fernando Orellana, Pete Latrofa, Keith Miller, and Janine Fron discuss collaborative processes for making installations and commissioned works, including the Telomeres Project on Imminent Immortality (in the SIGGRAPH 2001 Art Gallery) and the Battle of Midway Memorial for Chicago's Midway Airport. Topics include: the pervasive nature of artists working in electronic media today (artist as producer, artist as programmer, artist as curator, artist as director) and how the convergence and divergence of these roles informs our relationships with media and art history.

ELLEN SANDOR
(art)ⁿ
artn@artn.com

2 - 2:30 pm

Studio Floor

Breakout Session

B+W Printmaking with Piezography

The basic techniques for making black-and-white digital prints with Piezography BW.

BILL BERGH
Cone Editions Press, Ltd.
bergh@cone-editions.com

2:30 - 3 pm Interactive Classroom

Lenticular Imaging

The history and evolution of lenticular prints, which bend light to produce the illusion of 3D, morphing, or animation.

RALEIGH SOUTHER
Motion Graphix
raleigh@motiongraphix.com

5 - 5:30 pm Interactive Classroom

Artist Talk: Dynamic Collage Layout

CollageMachine, an information-visualization browser, alters the granularity of browsing. It downloads documents and decomposes them into media elements (images and chunks of text) that stream into a collage. As users rearrange the collage interactively, an agent models their interests.

ANDRUID KERNE
Tufts University
andruid@creatingmedia.com

5:30 - 6 pm Interactive Classroom

Artist Talk: Network Communicate Kaleidoscope

In Network Communicate Kaleidoscope, a virtual space accessible via the Internet, people connect to a void world as "particles" and enjoy chatting and interacting with others. After they disconnect, their remnant particles interact with other particles to represent the activity of all who have ever connected in the virtual space. The project's theme is to explore and create beautiful images such as a kaleidoscope of "clustering fireflies," but images can be made by anonymous personalities beyond the artists. In this context, the user/joiner contributes to and knows the substance of the art.

KAZUSHI MUKAIYAMA
Independent
i@kazushi.net

9 - 9:30 am Interactive Classroom

Input: Integrating the Hand

How to use scanning and capture techniques to integrate the hand into the input process.

JON CONE
Cone Editions Press, Ltd.
jon@cone-editions.com

9:30 - 10 am Interactive Classroom

Output: the Digital Print

What makes a great digital print? Starting with the print and working backward, this session shows what to look for in a fine-art print.

LARRY DANQUE
Cone Editions Press, Ltd.
larry@cone-editions.com

10 - 10:30 am Interactive Classroom

Collecting and Using Unique Source Material

How artists Helen Golden and Lyn Bishop collect and integrate unique source material into their work. Topics include: image gathering and image use in the artmaking process and how to integrate Genuine Fractals and Lucis Art software in combination with Photoshop to create new images.

HELEN GOLDEN
Tradigital Fine Art
hsgolden@aol.com

LYN BISHOP
Zama Arts
lyn@zama.com

10:30 - 11 am Studio Floor

Breakout Session**Scanning Unusual 2D Objects**

How unusual 2D objects are scanned as unique source material.

LARRY DANQUE
Cone Editions Press, Ltd.
larry@cone-editions.com

HELEN GOLDEN
Tradigital Fine Art
hsgolden@aol.com

LYN BISHOP
Zama Arts
lyn@zama.com

10:30 - 11:30 am Interactive Classroom

Beyond the Technology

Artists who make extensive use of 3D computer technologies show their work and discuss the impact (both practical and conceptual) of rapid-prototyping processes on their studio practice.

MICHAEL REES
New York Institute of Technology
x@michaelrees.com

ROBERT MICHAEL SMITH
New York Institute of Technology
sculpt3D@nyc.rr.com

JAMES STEWART
Arizona State University
james.stewart@asu.edu

SCOTT VAN NOTE
Arizona State University
scottv@asu.edu

noon - 1 pm Interactive Classroom

3D Modeling Applications: Comparisons and Contrasts

3D modeling techniques are demonstrated in different software packages (Rhino, Maya, form•Z, Marai, 3D Studio Max) to show the strengths (and glitches) of each.

DAVID RICHARD NELSON
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MICHAEL REES
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ROBERT MICHAEL SMITH
New York Institute of Technology
sculpt3D@nyc.rr.com

KIM VOIGT
Temple University
kimvoigt@earthlink.net

1 - 1:30 pm Studio Floor

Breakout Session**Creating Alternative Substrates**

Various techniques for creating unique substrates. With traditional art media such as modeling paste, rabbit-skin glue, and fresco materials, unique surfaces can be created for printing or transferring a digital print.

LYN BISHOP
Zama Arts
lyn@zama.com

1:30 - 2 pm Studio Floor

Breakout Session**Transfer Techniques**

Various techniques for transferring digital images to a variety of substrates, including traditional paper and alternative surfaces.

LARRY DANQUE
Cone Editions Press, Ltd.
larry@cone-editions.com

LYN BISHOP
Zama Arts
lyn@zama.com

2 - 2:30 pm Interactive Classroom

Digital Fabric Design

Basic techniques for creating repeatable pattern tiles for use in digital textile printing. Participants apply what they learn to creation of digital fashions as part of the Digital Couture collaboration. Selected attendee designs are printed, sewn, and shown in The Studio fashion show on Friday, 17 August.

ISA GORDON
Arizona State University
isa.gordon@asu.edu

2:30 - 3 pm Interactive Classroom

Cool Stuff With Painter

Some of Painter's key capabilities, including cloning, tracing, layers, shapes, and scripts.

JACQUELYN MARTINO
Philips Research, USA
jam67@columbia.edu

5 - 5:30 pm Interactive Classroom

Artist Talk: Ghost City and Visual Chaos Revealed

Visual Chaos.org uses the Web as a sculptural space. It asks viewers to interact with animated graphics that move across the frame in order to delve deeper and deeper into the space of an imaginary city.

JODY ZELLEN
Independent
jodyzel@aol.com

9 - 9:30 am Interactive Classroom

Reverse Engineering

A high-level overview of reverse engineering or creating CAD surfaces from scanned data. Topics include using software from 3D compression technologies and Raindrop Geomagic to illustrate converting-point cloud and polygonal data (PLY and STL files), using compression schemes for Web viewing, and converting them into B-spline patches. This brief tutorial does not allow enough time for details. Attendees should schedule some hands-on work in The Studio for further exploration.

ANSHUMAN RAZDAN
Arizona State University
razdan@asu.edu

10 - 10:30 am Studio Floor

Breakout Session

3D Data Capture Overview

An overview of 3D data-capture processes and demonstration of specific scanning devices in operation in The Studio.

DAN COLLINS
Arizona State University
dan.collins@asu.edu

OSHA MAKAI SMITH
Arizona State University
omsmith@asu.edu

10:30 - 11 am Studio Floor

Breakout Session

Rapid Prototyping Overview

An overview of rapid prototyping processes and explanation of RP systems in operation in The Studio.

ELONA VAN GENT
Grand Valley State University
vangente@gvsu.edu

2 - 5 pm Studio Floor

Breakout Session

The Art of Blender

Blender, a freeware 3D tool by Not a Number, is a powerful alternative for generating 3D content and animation. The interface, modeling, and animation tools are shown and discussed as a means of encouraging The Studio participants to explore this unique and accessible tool.

DAVID RICHARD NELSON
Pixar Animation Studios
dnelson@pixar.com

4 - 6 pm Studio Floor

Breakout Session

Digital Fabric Preview for The Studio Fashion Show

Attendees preview and vote on the digital fabrics that will be featured in The Studio's Couture Show on Friday, 17 August. Winning fabrics are printed and sewn into garments on The Studio floor.

JASON J. BROWN
Low Resolution Films
jasonjbrown@hotmail.com

5:30 - 6 pm Interactive Classroom

Color Management with Photoshop 6

This survey of color fundamentals covers many questions such as: What is color? What is an ICC profile? And what is a working space? Topics include how Photoshop 6 handles color via the new color settings dialog box, where users set up color spaces and specify color-management policies.

MANNY SEPULVEDA
Praxisoft
mannys@praxisoft.com

9 - 10 am Interactive Classroom

Effects and Dynamics Animation

An introduction to particle systems, dynamics, and volumetric shading techniques using Alias|Wavefront Maya. Topics include: water simulation as an example of what can be accomplished using Maya's core tools and optimization of these systems for efficient rendering.

MICHAEL GUDZ
Independent Graphic Artist
visions@websitesite.com

10 - 10:30 am Studio Floor

Breakout Session**3D Data Capture Overview**

An overview of 3D data-capture processes and demonstration of specific scanning devices in operation in the Studio.

DAN COLLINS
Arizona State University
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OSHA MAKAI SMITH
Arizona State University
omsmith@asu.edu

10:30 - 11 am Studio Floor

Breakout Session**Rapid Prototyping Overview**

An overview of rapid prototyping processes and explanation of RP systems in operation in the Studio.

ELONA VAN GENT
Grand Valley State University
vangente@gvsu.edu

1 - 1:30 pm Interactive Classroom

Creating Panoramas With QTVR

Creating Quicktime VR panoramic paintings with an interactive interface and soundtrack. QTVR panoramas are composites of traditional and digital painting and imaging, with variable levels of scale and detail.

PHILIP SANDERS
CLO
ps@thing.net

5 - 6 pm Interactive Classroom

2D Animation Special Effects Tips & Tricks

Discussion of the fundamentals of Adobe AfterEffects Pro Bundle. Topics include: special effects tips and tricks (motion paths, 3D illusions, expressions, and parenting), using Vector Paint, compositing, and much more.

JEFF DANSER
Collegis, Inc.
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EDWARD HOWELL
Collegis, Inc.
ehowell@valencia.cc.fl.us

All Day

The Studio Fashion Show

This mission-critical project involves 2D artists and wide-format printing with performance art via a fashion show developed during the five days of SIGGRAPH 2001.

JASON J. BROWN
Low Resolution Films
jasonjbrown@hotmail.com

Student Volunteers

Student Volunteers provide essential services to the annual SIGGRAPH conference, and they gain valuable tangible and intangible benefits: attendance at the world’s premier conference on computer graphics and interactive techniques; the opportunity to meet and work with the pioneers, professionals, and peers in their chosen field; contacts and friendships with many other people with similar interests; and a strong sense of accomplishment.

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Industrial Light + Magic

JIM KILMER
The Opal Group

BRIAN C. MASHBURN
Management Services for
Education Data

DJ MERRILL
Dartmouth College

SHANNON TUCKER
SIGGRAPH 2002 Student
Volunteers Chair
University of Maryland

SIGGRAPH TV

Informative, insightful HDTV summaries of SIGGRAPH 2001 delivered to high-resolution plasma displays in monoliths located throughout the Los Angeles Convention Center.

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United Space Alliance

Committee

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Industrial Light + Magic

NIC DUGGER
Media Arts, Inc.

LYNN HENNAGIN
Communication Images
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ERICA HORNUNG
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MARY NICHOLS
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StarMedia

DONNA SKATTUM
Shot In The Dark Productions

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DAVID STANLEY
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GARY STONE
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Debey Von Productions

ROBYN WILSON
Science Applications International
Corporation (SAIC)

Program Coordinator

KALEY BIEKER
Capstone Solutions, Inc.

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Live and archived, streamed and served. Papers. Interactive and animated 3D graphics. Video, audio, images, and transcripts. Panels, art, emerging technology, and interviews, all online.

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Naval Postgraduate School

Committee

MIKE COLLINS
Naval Postgraduate School
(Student)

ALLEN DUTTON
Naval Postgraduate School
(Student)

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Yahoo Argentina

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JEFF WEEKLY
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KATIE RYLANDER
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GraphicsNet

A state-of-the-art fiber backbone featuring wired and wireless communication links with the convention center and with the global computer graphics community. GraphicsNet is the SIGGRAPH 2001 conference intranet. It serves as the link among the many conference programs and events, and as the gateway to the global graphics community.

SIGGRAPH 2001 provides wireless ethernet links in limited areas of the Convention Center. Attendees who want to use the wireless links should have their own wireless PC cards (802.11b).

GraphicsNet is built on FastEthernet links (100 Mbps) connecting the Internet Access Centers and wireless network locations; the presentation rooms for Papers, Panels, Courses, Sketches & Applications; Art Gallery, Educators Program, Emerging Technologies, Creative Applications Lab, and The Studio.

The production backbone is built with products from Cisco Systems, 3COM, Fluke, and others. It is connected to the Internet through a T3 circuit supplied by the Convention Center. The primary network management workstations and servers used in the Network Operations Center (NOG) are supplied by Sun Microsystems, Inc.

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University of Illinois at Chicago

Networking Committee
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SIGGRAPH 2002
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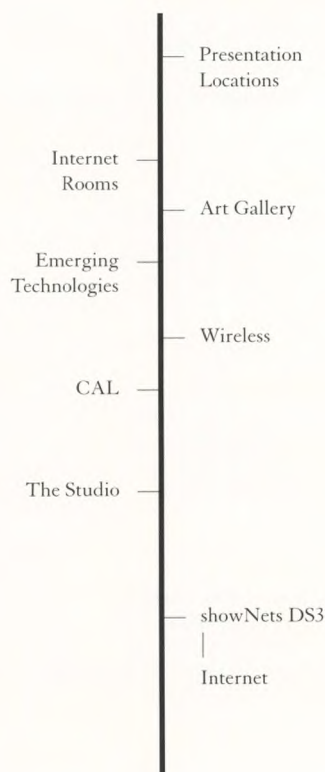
JODI GIROUX
Riot Pictures

KA-LEUNG JARK
University of Illinois at Chicago

ED KONOWAL
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District

LANCE LONG
University of Illinois at Chicago

Fast Ethernet Backbone



International Resources

The SIGGRAPH 2001 International Committee delivers assistance, information, and answers to your questions in multiple languages at the International Center. Throughout the Los Angeles Convention Center, multi-lingual student volunteers are available to answer questions and provide assistance. Look for their yellow vests with flags that indicate language fluency.

Chair

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Au Centre international, le Comité international du SIGGRAPH 2001 offrira une assistance, des informations et des réponses à vos questions dans diverses langues. Dans tout le palais des congrès de Los Angeles, des étudiants bénévoles multilingues seront également à votre disposition pour prêter assistance et répondre à vos questions.

El Comité Internacional de SIGGRAPH 2001 proporciona asistencia, información y respuestas a sus preguntas en varios idiomas, en el Centro Internacional. Por todo el Centro de Convenciones de Los Angeles habrá estudiantes multilingües voluntarios para asistirle y contestar sus preguntas.

SIGGRAPH 2001 インターナショナル・コミTEE は、インターナショナル・センターにおいて 多言語で皆さまをアシストし、情報提供や質問 への応対をいたします。また、ロサンゼルス・コンベンション・センターではいたる所で、多 言語の学生ボランティアがご質問にお答えし、アシストできるようお待ちしております。

SIGGRAPH 2001 International Committee 는국제 센터에서 여러분의 문의에 대해 다국어로 지원과 도움, 해답을 제공합니다. 로스앤젤레스 컨벤션 센터 어디에서나, 다국어 학생 자원봉사자들이 문의사항에 대해 답해 드리고, 도움을 제공하기 위해 대기하고 있습니다.

English is the official language of SIGGRAPH 2001.

L'anglais est la langue officielle du SIGGRAPH 2001.

Englisch is die offizielle Sprache der SIGGRAPH 2001.

L'inglese è la lingua ufficiale di SIGGRAPH 2001.

O inglês é língua oficial da SIGGRAPH 2001.

Английский язык является официальным языком общения СИГГРАПЖ 2001.

El inglés es el idioma oficial de SIGGRAPH 2001.

SIGGRAPH 2001 の公用語は英語です。

SIGGRAPH 2001 의 정식 언어는 영어입니다.

英文是 SIGGRAPH 2001 的法定語言。

Career Services

Are you looking for a job in the computer graphics industry? Does your company have openings for qualified individuals in the computer graphics industry? If so, then SIGGRAPH 2001's employment headquarters is the place for you!

Career Center

SIGGRAPH 2001 hosts the world's largest annual career center for companies and job-seekers in computer graphics and interactive techniques. Employers post job openings and schedule interviews with candidates. Prospective employees post resumes, show their demo reels, and consult with experienced professionals about career opportunities. Companies that are not SIGGRAPH 2001 exhibitors must pay a \$600 fee to participate in the Career Center. Non-profit organizations are eligible for discounted fees.

Job Fair

On Wednesday, 15 August, the leading companies in computer graphics along with thousands of SIGGRAPH 2001 attendees share information about skills, experience, and employment opportunities in a relaxed, informal setting. The Job Fair is open to all SIGGRAPH 2001 attendees. Fee for participating exhibitors and non-exhibitors: \$800.

Career Center Location Kentia Hall

Days & Hours

Sunday, 12 August
2 – 7 pm

Monday, 13 August through
Thursday, 16 August
8 am – 6 pm

Friday, 17 August
8 am – 3 pm

Job Fair Location Kentia Hall

Day & Hours

Wednesday, 15 August
8 am – 5 pm

Job Fair Participants (as of 16 July 2001) See Web site for complete details.

ANGEL STUDIOS
Carlsbad, California USA

THE ART INSTITUTES
Pittsburgh, Pennsylvania USA

BORIS FX
Boston, Massachusetts, USA

HIGH VOLTAGE SOFTWARE
Hoffman Estates, Illinois USA

LUCAS ARTS ENTERTAINMENT
San Rafael, California USA

MAJESCO INC.
Edison, New Jersey USA

MIDWAY HOME
ENTERTAINMENT INC.
San Diego, California USA

NELVANA
Toronto, Ontario, CANADA

NEXTENGINE, INC.
Santa Monica, California USA

NINTENDO OF AMERICA
Redmond, Washington USA

ODDWORLD INHABITANTS
San Luis Obispo, California USA

PACIFIC NORTHWEST
NATIONAL LABORATORY –
BATTELLE
Richland, Washington USA

SAVANNAH COLLEGE OF ART
AND DESIGN
Savannah, Georgia USA

STORMFRONT STUDIOS
San Rafael, California USA

Birds of a Feather

Sessions for attendees who think and work in similar technologies and environments. These sessions are open to all attendees.

At SIGGRAPH 2001 impromptu gatherings can be organized through the Birds of a Feather schedule board. Simply use the sign-up board in the South Lobby, where late additions and revisions to the Birds of a Feather schedule are posted.

For more information on these Birds of a Feather sessions, contact:

ACCAD Alumni - The Ohio State University VIKI JONES +1.614.292.1025	Education Committee Open Meeting MIKE McGRATH +1.303.454.9726	Molecular Graphics MICHAEL PIQUE +1.858.784.9775	SPEC/GPC Press Conference BOB CRAMBLITT +1.919.481.4599
ACM SIGGRAPH Carto BOF Meeting THERESA-MARIE RHYNE +1.919.544.1817	Eurographics Workshop CLINT CHUA +1.213.740.4250	New York Institute of Technology Presidential Medal Award HELEN BAYONA +1.212.261.1796	Student Chapters Meet & Greet JOHN UTTER +1.503.648.3300
ACM SIGGRAPH Chapters Business Meeting SCOTT LANG +1.201.343.6000 x3380	Hash Animation: Master SIG KEN BAER +1.360.750.0042	Non-Photorealistic Rendering BOF AMY GOOCH +1.919.587.7645	The 14th SIGGRAPH Sake Party TOSHIHIRO YATSUMONJI +81.489.66.8127
ACM SIGGRAPH Chapters Development Workshop SCOTT LANG +1.201.343.6000 x3380	Houdini General Session and User Group Meeting / Reception ERIN COUGHLIN +1.310.319.9876	OpenGL Birds of a Feather CHELESA PAVLINA +1.949.224.4566	The Future of the SIGGRAPH Conference SCOTT OWEN / JENNIFER ANDERSON +1.719.599.3734
ACM SIGGRAPH Chapters Start up Meeting SCOTT LANG +1.201.343.6000 x3380	IEEE Technical Committee on Visualization and Graphics ROBERT MOORHEAD +1.662.325.2850	OpenGL Performers Users Group CHELESA PAVLINA +1.949.224.4566	The Next Big Thing SUSAN HUGHES +1.603.891.9425
ACM SIGGRAPH Student Chapters Start up Meeting SCOTT LANG +1.201.343.6000 x3380	ISEA Meeting CYNTHIA RUBIN +1.203.789.0071	OpenML Birds of a Feather ELIZABETH RIEGEL +1.408.399.2233	The Underground Demo Scene VINCENT SCHEIB +1.919.962.1905
Character Studio Central MICHELE BOUSQUET +1.603.895.2477	Java 3D MICHAEL SCHULMAN +1.650.786.0529	OpenSG BOF DIRK REINERS +49.6151.155273	UNC-Chapel Hill Graphics Reunion ELIZABETH SMITHWICK +1.919.962.1779
Component Based Visualization and Interactive Environments ARTHUR OLSON +1.858.784.9702	Java Media Framework API BOF GARY GINSTLING +1.408.517.5619	OZONE: Computer Art, A-Life, Archaeology KEVIN CAIN +1.510.843.4261	University of Utah Alumni Meeting AMY GOOCH +1.901.587.7645
Computer Graphics Pioneers SHERRY KEOWEN +1.818.347.2210	Massively Parallel Graphics and Visualization PATRICIA CROSSNO +1.505.845.7506	Ray Tracing Roundtable ERIC HAINES +1.807.277.5445	
		SIGGRAPH Public Policy BOB ELLIS ellis@siggraph.org	

Hotels/Maps of Los Angeles

Best Western Colorado Inn

2156 East Colorado Inn
Pasadena, California
+1.626.793.9339
+1.626.568.2731 fax

Best Western Mayfair

1256 West 7th Street
Los Angeles, California
+1.213.484.9789
+1.213.484.2769 fax

Best Western Pasadena Inn

3570 East Colorado Boulevard
Pasadena, California
+1.626.796.9100
+1.626.405.9948 fax

Best Western Pasadena Royale

3600 East Colorado Boulevard
Pasadena, California
+1.626.793.0950
+1.626.568.2827 fax

Beverly Hilton

9876 Wilshire Boulevard
Beverly Hills, California
+1.310.274.7777
+1.310.285.1313 fax

Courtyard by Marriott

Century City
10320 West Olympic Boulevard
Los Angeles, California
+1.310.556.2777
+1.310.203.0563 fax

Doubletree Hotel Pasadena

191 North Los Robles Avenue
Pasadena, California
+1.626.792.2727
+1.626.795.7669 fax

Hilton Pasadena

168 South Los Robles
Pasadena, California
+1.626.577.1000
+1.626.584.3148 fax

Holiday Inn Downtown

Los Angeles
750 Garland Avenue
Los Angeles, California
+1.213.628.9900
+1.213.628.1201 fax

Holiday Inn Los Angeles

City Center
1020 South Figueroa Street
Los Angeles, California
+1.213.748.1291
+1.213.748.6028 fax

Holiday Inn Select Beverly Hills

1150 South Beverly Drive
Los Angeles, California
+1.310.553.6561
+1.310.277.4469 fax

Hotel Figueroa

939 South Figueroa Street
Los Angeles, California
+1.213.627.8971
+1.213.689.0305 fax

Hyatt Regency Los Angeles

711 South Hope Street
Los Angeles, California
+1.213.683.1234
+1.213.629.3230 fax

Inn Towne Hotel

913 South Figueroa Street
Los Angeles, California
+1.213.628.2222
+1.213.687.0566 fax

Kawada Hotel

200 South Hill Street
Los Angeles, California
+1.213.621.4455
+1.213.687.4455 fax

Los Angeles Athletic Club

431 West Seventh Street
Los Angeles, California
+1.213.625.2211
+1.213.689.1194 fax

Los Angeles Marriott

Downtown
333 South Figueroa Street
Los Angeles, California
+1.213.617.1133
+1.213.613.0291 fax

Millennium Biltmore

(formerly Regal Biltmore)
506 South Grand Avenue
Los Angeles, California
+1.213.624.1011
+1.213.612.8221 fax

Miyako Inn

328 East 1st Avenue
Los Angeles, California
+1.213.617.2000
+1.213.617.2700 fax

New Otani Hotel

120 South Los Angeles Street
Los Angeles, California
+1.213.629.1200
+1.213.622.0980 fax

Old Pasadena Courtyard

by Marriott
180 North Fair Oaks Avenue
Pasadena, California
+1.626.403.7600
+1.626.403.7700 fax

Omni Los Angeles

251 South Olive Street
Los Angeles, California
+1.213.617.3300
+1.213.617.3399 fax

Quality Inn & Suites

Downtown Los Angeles
1901 West Olympic Boulevard
Los Angeles, California
+1.213.385.7141
+1.213.385.5808 fax

Quality Inn Pasadena

3321 East Colorado Boulevard
Pasadena, California
+1.626.796.9291
+1.626.796.9780 fax

Radisson Wilshire Plaza

3515 Wilshire Boulevard
Los Angeles, California
+1.213.381.7411
+1.213.386.7379 fax

Ramada Inn Pasadena

3500 East Colorado Boulevard
Pasadena, California
+1.626.792.1363
+1.626.792.9213 fax

Ritz-Carlton Huntington

1401 South Oak Knoll Avenue
Pasadena, California
+1.626.568.3900
+1.626.568.3700 fax

Sheraton Pasadena

303 East Cordova Street
Pasadena, California
+1.626.449.4000
+1.626.584.1390 fax

Travelodge Pasadena

2131 East Colorado Boulevard
Pasadena, California
+1.626.796.3121
+1.626.793.4713 fax

Vagabond Inn Pasadena West

1203 East Colorado Boulevard
Pasadena, California
+1.626.449.3170
+1.626.577.8873 fax

Westin Bonaventure

404 South Figueroa Street
Los Angeles, California
+1.213.624.1000
+1.213.612.4800 fax

Westin Century Plaza

Hotel & Tower
2025 Avenue of the Stars
Los Angeles, California
+1.310.277.2000
+1.310.551.3355 fax

Westway Inn

1599 East Colorado Boulevard
Pasadena, California
+1.626.304.9678
+1.626.449.3493 fax

Wilshire Grand Hotel and Centre

(Headquarters Hotel)
930 Wilshire Boulevard
Los Angeles, California
+1.213.688.7777
+1.213.612.3989 fax

Wilshire Royale Howard

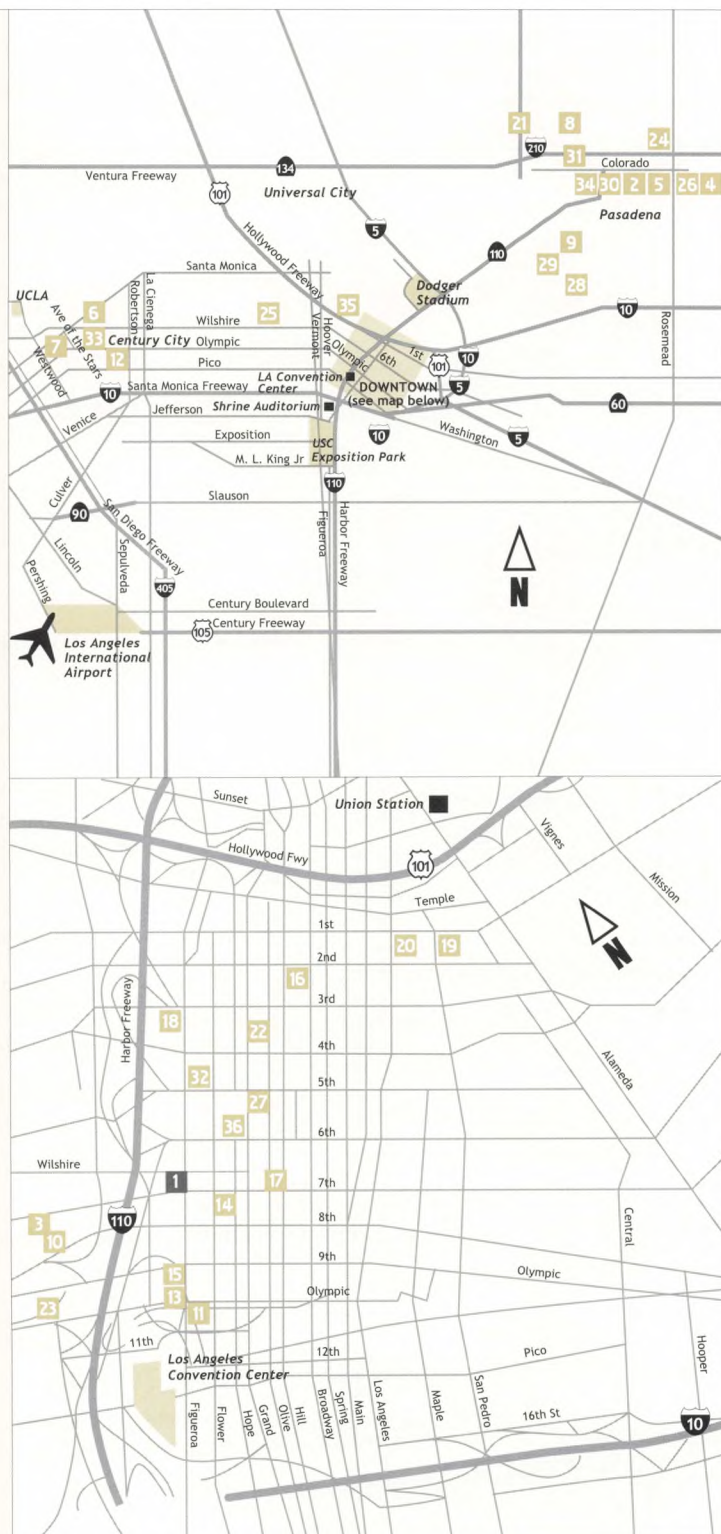
Johnson Plaza
2619 Wilshire Boulevard
Los Angeles, California
+1.213.387.5311
+1.213.380.8174 fax

Wyndham Checkers

535 South Grand Avenue
Los Angeles, California
+1.213.624.0000
+1.213.626.9906 fax

Los Angeles Area

- 1 Wilshire Grand Hotel & Centre (*Headquarters Hotel*)
- 2 Best Western Colorado Inn
- 3 Best Western Mayfair
- 4 Best Western Pasadena Inn
- 5 Best Western Pasadena Royale
- 6 Beverly Hilton
- 7 Courtyard by Marriott Century City
- 8 Doubletree Hotel Pasadena
- 9 Hilton Pasadena
- 10 Holiday Inn Downtown Los Angeles
- 11 Holiday Inn Los Angeles City Center
- 12 Holiday Inn Select Beverly Hills
- 13 Hotel Figueroa
- 14 Hyatt Regency Los Angeles
- 15 Inn Towne Hotel Los Angeles
- 16 Kawada Hotel
- 17 Los Angeles Athletic Club
- 18 Los Angeles Marriott Downtown
- 19 Miyako Inn
- 20 New Otani Hotel
- 21 Old Pasadena Courtyard by Marriott
- 22 Omni Los Angeles
- 23 Quality Inn & Suites Downtown Los Angeles
- 24 Quality Inn Pasadena
- 25 Radisson Wilshire Plaza
- 26 Ramada Inn Pasadena
- 27 Regal Biltmore (Now Millennium Biltmore)
- 28 Ritz-Carlton Huntington
- 29 Sheraton Pasadena
- 30 Travelodge Pasadena
- 31 Vagabond Inn Pasadena West
- 32 Westin Bonaventure
- 33 Westin Century Plaza Hotel & Tower
- 34 Westway Inn
- 35 Wilshire Royale Howard Johnson Plaza
- 36 Wyndham Checkers



123

Downtown Los Angeles

Registration and Media Information

Conference Registration Categories

- Full Conference
- Conference Select
- ▲ Exhibits Plus

Programs, Activities, and Documentation Included with your Registration

▲ ● ■ Exhibition/Startup Park

TECHNICAL PROGRAM

- Courses
- Papers
- Panels
- ■ Sketches & Applications
- ■ Educators Program

CONFERENCE PROGRAMS & ACTIVITIES

- ▲ ● ■ ACM SIGGRAPH Forum
- ▲ ● ■ Art Gallery
- ▲ ● ■ Birds of a Feather
- ▲ ● ■ Career Center
- Computer Animation Festival:
 - Electronic Theater Ticket-Any Show
 - ■ Electronic Theater Matinée Ticket
- ▲ ● ■ Animation Theaters
- ■ Creative Applications Lab
- ▲ ● ■ Emerging Technologies
- ▲ ● ■ Exhibitor Forums
- ▲ ● ■ Fundamentals Seminar
- ▲ ● ■ International Resources
- ▲ ● ■ Internet Access Centers
- ▲ ● ■ Job Fair
- ▲ ● ■ Keynote Address/Awards
- ▲ ● ■ Pathfinders
- ▲ ● ■ SIGGRAPH TV
- Special Sessions:
 - ■ Daytime
 - ▲ ● ■ Evening
 - ■ The Studio

DOCUMENTATION

- ■ Conference Abstracts & Applications & CD-ROM
- ■ Electronic Art & Animation Catalog & CD-ROM
- Conference Proceedings, Video, & CD-ROM
- Course Notes CD-ROM

RECEPTIONS

- Courses Reception
- Papers/Panels Reception

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 include copies of the following to your registration form to qualify for student rates (this applies for those registering in advance as well as at the conference):

- Your 2001 ACM student membership card OR
- Your valid 2001 student identification card AND a letter on school letterhead verifying you are a student. The letter must include your registrar's name, address, and phone number so we can verify your student status.
- When you arrive at SIGGRAPH 2001, you must present your ID card (not a copy) in order to pick up your credentials.

Failure to attach one of the above to your registration form 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 Hours

Saturday, 11 August	6 - 8 pm
Sunday, 12 August	9 am - 7 pm
Monday, 13 August	8 am - 5 pm
Tuesday, 14 August	8 am - 5 pm
Wednesday, 15 August	8 am - 5 pm
Thursday, 16 August	8 am - 5 pm
Friday, 17 August	8 - 11 am

Media Headquarters

Room 301

Los Angeles Convention Center

Days & Hours

Sunday, 12 August	10 am - 6 pm
Monday, 13 August	8 am - 6 pm
Tuesday, 14 August	8 am - 6 pm
Wednesday, 15 August	8 am - 6 pm
Thursday, 16 August	8 am - 5 pm
Friday, 17 August	8:30 am - 1 pm

Media Registration

Media representatives must register in the Media Headquarters Office, Room 301. 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 is the place for you to hear about what's new and what's hot at SIGGRAPH 2001. Preview the Electronic Theater and receive insight into SIGGRAPH 2001 programs and activities. Gain access to the exhibit floor before it opens to the attendees for a "sneak preview" of the latest products and applications. Small groups of media representatives will be escorted onto the exhibit floor.

Media Briefing

LACC Theater, Room 411

Tuesday, 14 August 8:15 - 8:45 am

Exhibition Floor Tour

Exhibit Floor

Tuesday, 14 August 9 - 10 am

Exhibitor Media Events

A schedule of various exhibitor media events will be available in the Media Headquarters Office in Room 301 of the Los Angeles Convention Center.

Attendee Services

SIGGRAPH 2001 and the Los Angeles Convention Center offer several services during the conference to make your week more enjoyable.

Airport Shuttle Desk

Lobby Outside Kentia Hall
800.427.7483

Days & Hours

Saturday, 11 August	6 - 8 pm
Sunday, 12 August	9 am - 7 pm
Monday, 13 August	9 am - 5 pm
Tuesday, 14 August	9 am - 5 pm
Wednesday, 15 August	9 am - 5 pm
Thursday, 16 August	9 am - 5 pm
Friday, 17 August	9 am - 6:30 pm

A service desk is available to make airport shuttle reservations. Return reservations should be made at least one day prior to your departure.

Audio/Visual Services

Room in Back of West Hall A
+1.213.765.4639

Days & Hours

Saturday, 11 August	noon - 7 pm
Sunday, 12 August	7 am - 7 pm
Monday, 13 August	7 am - 7 pm
Tuesday, 14 August	7 am - 7 pm
Wednesday, 15 August	7 am - 7 pm
Thursday, 16 August	7 am - 7 pm
Friday, 17 August	7 am - 2 pm

Direct all questions about audio/visual needs to this office. For more information on audio/visual services for speakers, see Speaker Prep Room (located in the front of West Hall A).

Automated Teller Machines (ATMs)

There are several ATMs located throughout the lobbies of the Los Angeles Convention Center.

Banks/Currency Exchange

The closest bank and Currency Exchange to the Los Angeles Convention Center is Washington Mutual Bank located at 888 West 7th Street (+1.213.624.1403) and Foreign Currency Express located at 404 South Figueroa (+1.213.624.3693). They are both available for any banking/currency exchange needs you may have during your stay in Los Angeles.

Beaming Stations

NEW! SIGGRAPH 2001 will provide conference and exhibitor information for Palm OS handheld devices through the use of beaming stations located throughout the Los Angeles Convention Center.

Bookstore

West Lobby

For the latest books and CD-ROMs on computer animation, graphic design, gaming, 3D graphics, modeling and digital lighting, visit the SIGGRAPH 2001 bookstore, which is managed by BreakPoint Books (BPB). Be sure to look for the latest books from SIGGRAPH 2001 speakers and award winners. Attendees can purchase books at a 10% discount rate.

BreakPoint Books will be coordinating a "Meet the Author" event in the bookstore location on Tuesday, 14 August. This is a great opportunity to meet with your industry colleagues! Stop by the bookstore to learn more about this event.

Sunday, 12 August	9 am - 7 pm
Monday, 13 August	8 am - 5 pm
Tuesday, 14 August	8 am - 5 pm
Wednesday, 15 August	8 am - 5 pm
Thursday, 16 August	8 am - 5 pm
Friday, 17 August	8 am - 6 pm

Note: Bookstore returns will be accepted up to 30 days after the conference. All bookstore policies are those of BreakPoint Books and not SIGGRAPH 2001.

Child Care

Room 518

KiddieCorp, Inc. provides child care services for children from three months to 16 years of age at the Los Angeles Convention Center. Children must be registered for a minimum of 3 hours. The registration fee is \$14.50 per child per hour. If you have any questions regarding registration, stop by Room 518.

The KiddieCorp, Inc. staff is certified in infant and child CPR. Child care services are available during the following hours:

Monday, 13 August	7:45 am - 6:15 pm
Tuesday, 14 August	7:45 am - 6:15 pm
Wednesday, 15 August	7:45 am - 6:15 pm
Thursday, 16 August	7:45 am - 6:15 pm
Friday, 17 August	7:45 am - 6:15 pm

Child care services can be arranged at other times by contacting KiddieCorp's office at +1.858.455.1718.

NEW! Children registered for Child Care services at SIGGRAPH 2001 are eligible for a new complimentary Child Pass, which provides access to Emerging Technologies, the Animation Theaters, and other programs and events. Children are not allowed to use their Child Passes alone. They must be accompanied by an adult with a valid SIGGRAPH 2001 registration. The Child Pass is not valid for the Exhibition. Children under 16 are not allowed on the exhibit floor at any time.

Conference Management Office

Room 304

+1.213.765.4625

If you have questions regarding SIGGRAPH 2001, call or stop by this office anytime.

Exhibition Management Office

Room 303

+1.213.765.4620

If you have any questions regarding the SIGGRAPH 2001 Exhibition, call or visit a staff member here.

Exhibitor Registration

Outside South Hall

Exhibitors should pick up their badges at the exhibitor registration counter, which is open during registration hours. See Registration.

First Aid Offices

South Hall

+1.213.741.1151 x5136

Petree Hall/West Hall

+1.213.741.1151 x5133

Calling within convention center: 4605

A nurse or paramedic is on duty at the first aid area.

Food Services

The Los Angeles Convention Center operates several food concession areas for the convenience of SIGGRAPH 2001 attendees. Food carts and casual seating are also available throughout the Convention Center.

Housing/Airline Desk

Lobby Outside Kentia Hall

+1.213.765.4632

If you have any questions about hotel accommodations or airline travel, stop by or call the Housing/Airline Desk.

Information Desks

South and West Lobbies

For answers to your questions about SIGGRAPH 2001, stop by the information desk. The staff can provide information on conference programs and events and answer Los Angeles-related questions.

International Center

West Lobby

+1.213.765.4212

The International Committee is available throughout the week to provide assistance and answer questions in multiple languages at the International Center.

Internet Access Centers

Rooms 410 and 510-512

These networked areas in the Los Angeles Convention Center provide email access for all attendees.

Los Angeles Convention Center

1201 South Figueroa Street

Los Angeles, California 90015 USA

+1.213.741.1151

www.lacclink.com

Accessibility

The Convention Center is wheel chair accessible. It has no curbs, and there are elevators to upper levels. If you have special needs or requirements, please call conference management at +1.213.765.4625.

Business Center

A variety of services are offered by the Business Center including: computer time rental, faxing services, and photocopying. The Business Center also sells office supplies and U.S. stamps.

Parking

SIGGRAPH 2001 attendees can park at the Los Angeles Convention Center for \$7 per day.

Lost and Found/Security

+1.213.765.4605

After the conference, all items will be turned over to the Los Angeles Convention Center security office. Lost registration badges will be held at Special Assistance in Kentia Hall.

Luggage/Coat Checks

South Lobby

Sunday, 12 August 8:30 am - 7:30 pm

Monday, 13 August 7:30 am - 6:30 pm

Tuesday, 14 August 7:30 am - 6:30 pm

Wednesday, 15 August 7:30 am - 6:30 pm

Thursday, 16 August 7:30 am - 6:30 pm

West Lobby

Thursday, 16 August 7:30 am - 6:30 pm

Friday, 17 August 7:30 am - 6:30 pm

Merchandise Pickup Center

South Lobby

Full Conference and Conference Select registrants must pick up technical materials that are included with registration at SIGGRAPH 2001. Shipping services are available at SIGGRAPH 2001. Technical materials will not be shipped after the conference.

Days & Hours

Saturday, 11 August 6 - 8 pm

Sunday, 12 August 9 am - 7 pm

Monday, 13 August 8 am - 5 pm

Tuesday, 14 August 8 am - 5 pm

Wednesday, 15 August 8 am - 5 pm

Thursday, 16 August 8 am - 5 pm

Friday, 17 August 8 - 11 am

Message Center

South Lobby

+1.213.765.4600

A message center will be staffed during all registration hours. Message center staff will be able to leave messages for any registered attendee. Message center staff will not be able to page any attendees.

Registration (Advance & On-site)

Kentia Hall

Saturday, 11 August 6 - 8 pm

Sunday, 12 August 9 am - 7 pm

Monday, 13 August 8 am - 5 pm

Tuesday, 14 August 8 am - 5 pm

Wednesday, 15 August 8 am - 5 pm

Thursday, 16 August 8 am - 5 pm

Friday, 17 August 8 - 11 am

Restaurant Information Desk

South Lobby

+1.213.765.4543

A restaurant information desk will be staffed during registration hours. The staff will be happy to set up dinner arrangements for small to large parties in the many restaurants of Los Angeles and the surrounding area.

Shipping Desk

South Lobby

For your convenience, a shipping desk at SIGGRAPH 2001 provides next-day air, second-day air, and regular ground shipping services to destinations throughout the world.

Shuttle Service

Outside of West Hall
800.975.7762

Los Angeles Convention Center Shuttle Days & Hours

Saturday, 11 August	4:30 - 8:30 pm
Sunday, 12 August	8 am - 7:30 pm
Monday, 13 August	7:30 am - 9 pm
Tuesday, 14 August	7:30 am - 6:30 pm
Wednesday, 15 August	7 am - 9:30 pm
Thursday, 16 August	7:30 am - 8:30 pm
Friday, 17 August	7:30 am - 6:30 pm

SIGGRAPH 2001 provides complimentary shuttle bus service between most conference hotels, the Los Angeles Convention Center, and to and from the SIGGRAPH 2001 receptions, Electronic Theater, and Course 35 at the Pacific Theatre. Look for signs and flyers indicating pick-up times and locations at your hotel, and the information desk located in the LACC. Please note: the Holiday Inn Los Angeles City Center, the Hotel Figueroa, and the Inn Towne Hotel Los Angeles are considered "walk" hotels and will not have shuttle service to or from the Los Angeles Convention Center.

If you have any questions, contact the Shuttle Service directly during official shuttle hours. Also, for assistance with handicapped service, please call 800.975.7762. SIGGRAPH 2001 provides buses with wheel chair lifts and downs.

Shuttles for Receptions

Courses Reception

Pershing Square
Olive and 6th Street

Papers/Panels Reception

Universal Studios Hollywood
100 Universal City Plaza
Universal City

Buses begin shuttling from all hotels 30 minutes before the receptions start. The last bus departs 15 minutes after the receptions close. Shuttles will transport attendees staying at the "walk" hotels (Holiday Inn City Center, Hotel Figueroa, and Inn Towne Hotel) to and from the receptions.

Shuttles to Electronic Theater

Shrine Auditorium

649 West Jefferson Boulevard

Matinée

Tuesday, 14 August	2 - 4 pm
Wednesday, 15 August	2 - 4 pm

Matinée shuttles begin transporting attendees to the Shrine one-hour prior to the start time. Shuttles return to the Los Angeles Convention Center only after the performance. Electronic Theater matinée shuttles do not drop off attendees at hotels.

Evening

Monday, 13 August	7 - 9 pm
Tuesday, 14 August	7 - 9 pm
Wednesday, 15 August	7 - 9 pm
Thursday, 16 August	7 - 9 pm

Evening shuttles begin transporting attendees from the LACC to the Shrine 1.5 hours prior to the start time. Shuttles return to the LACC, all hotels, and any corresponding receptions after the performance.

Shuttles to Pacific Theatre

Course 35

Monday, 13 August	9 am - 5 pm
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Digital Cinema Laboratory at the Pacific Theatre
6433 Hollywood Boulevard
Hollywood, California

Shuttles will begin loading at West Hall of the Los Angeles Convention Center at 7:45 am. There will be limited service between the Pacific Theatre and the LACC throughout the day. Shuttles return to the LACC after the performance. Pacific Theatre shuttles do not drop off attendees at hotels.

SIGGRAPH Store

South Lobby

+1.213.765.4228

At SIGGRAPH 2001, visit the Merchandise Store to purchase technical materials and the full range of SIGGRAPH 2001 merchandise items. Merchandise is available on a first-come, first-served basis. Please note that merchandise vouchers that are received as part of your registration can only be redeemed in the Pickup Center.

Some technical material and the SIGGRAPH Video Reviews are also available for sale after the conference. To order, contact the ACM Order Department at 800.342.6626.

Saturday, 11 August	6 - 8 pm
Sunday, 12 August	9 am - 7 pm
Monday, 13 August	8 am - 6 pm
Tuesday, 14 August	8 am - 6 pm
Wednesday, 15 August	8 am - 6 pm
Thursday, 16 August	8 am - 6 pm
Friday, 17 August	8 am - 3 pm

Speaker Prep Room

Front of West Hall A

+1.213.765.4202

Saturday, 11 August	noon - 7 pm
Sunday, 12 August	7 am - 7 pm
Monday, 13 August	7 am - 7 pm
Tuesday, 14 August	7 am - 7 pm
Wednesday, 15 August	7 am - 7 pm
Thursday, 16 August	7 am - 7 pm
Friday, 17 August	7 am - 2 pm

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129

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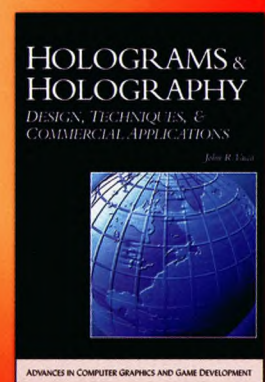
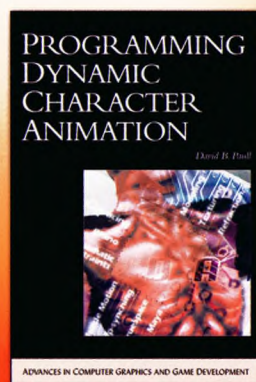
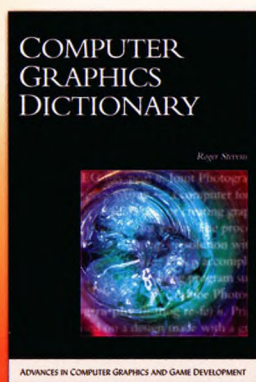
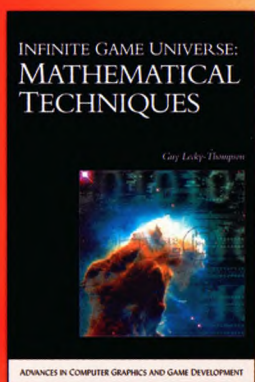
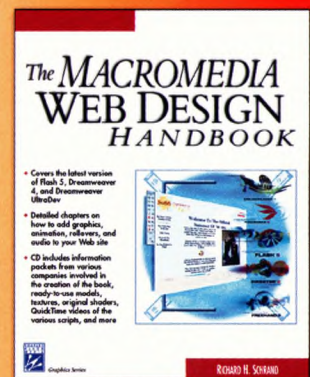
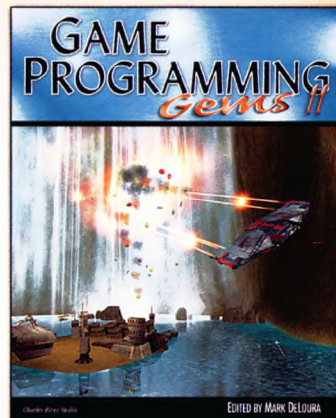
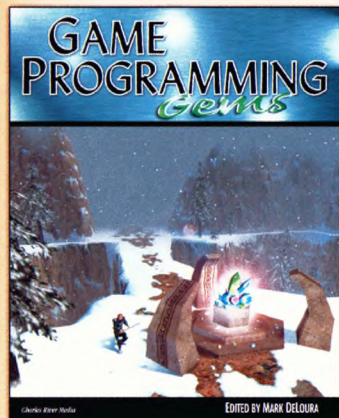
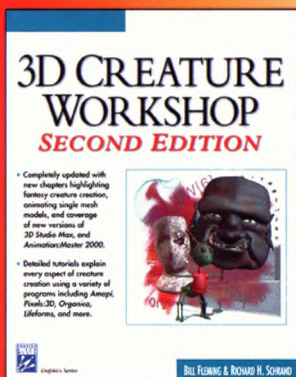
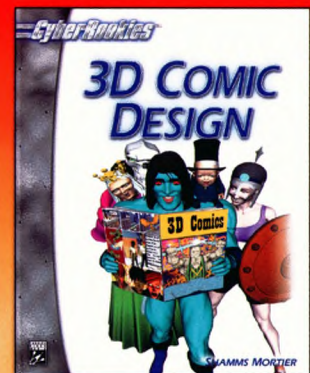
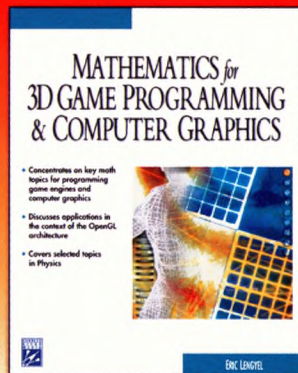
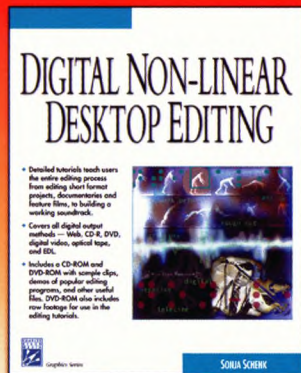
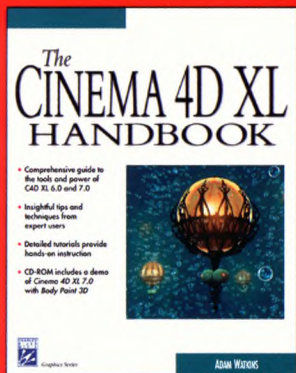
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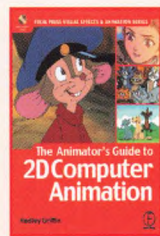
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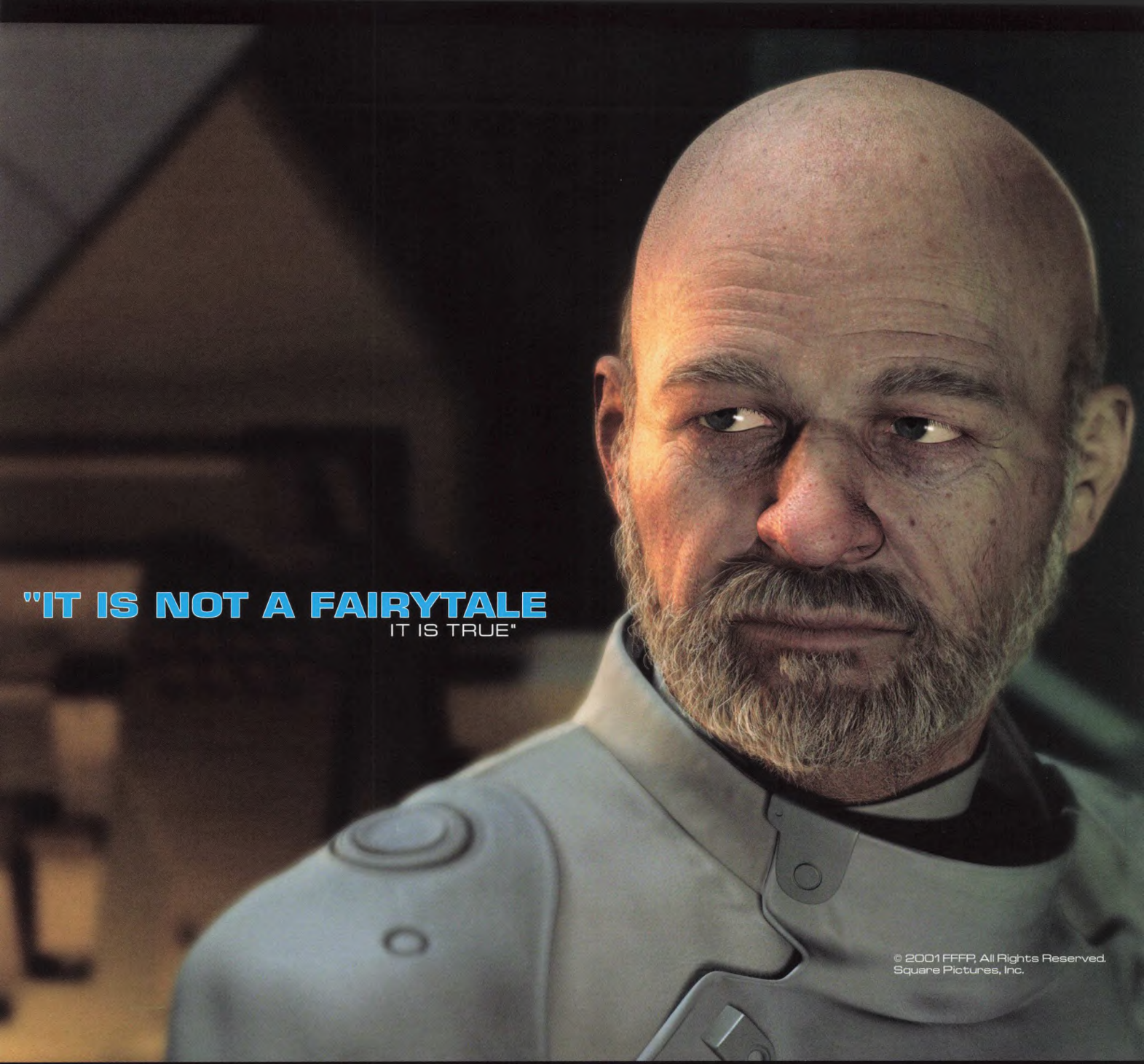
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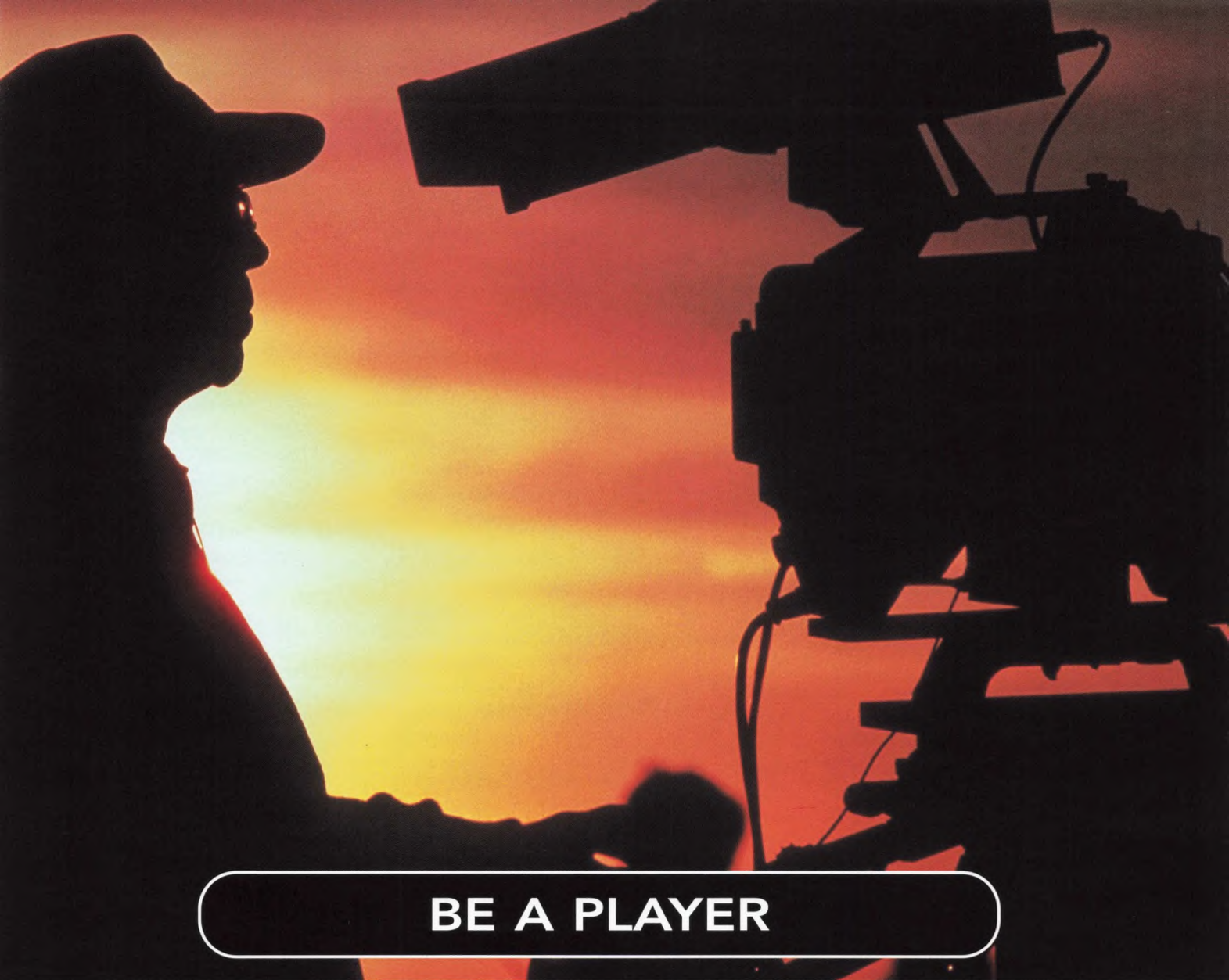
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1036 Addison Wesley-New Riders Publishing
1637 Adobe Systems, Inc.
546 Areté Entertainment, Inc.
937 Artbeats Digital Film Library
617 ATI Technologies Inc.
2163 AXA Software /netGuru Inc.
2438 Boris FX
847 Cambridge Animation Systems
514 Chyron Corporation
1101 Compaq Computer Corporation
1030 Computer Graphics Systems Development Corporation
1909 Computer Graphics World
1837 Creation Engine LLC
1926 Curious Software Company Ltd.
1050 Darkling Simulations
1760 Deep Video Imaging Ltd.
1034 Desktop Images
2448 Digital Domain, Inc.
524 Digital Vision Ltd.
2317 Digital Voodoo Australia Pty Ltd
1247 Discreet
2008 eyeon Software Inc.
2136 GoPo Media (Junior Land Co. Ltd)
1915 Hash Inc.
529 IMAGICA Corp.
539 JourneyEd.com
2411 Khronos Group
1805 Linker Systems, Inc.
853 MediaPEGS
1833 NEC Computers, Inc.
1125 NewTek
1367 Nothing Real LLC
813 Pixologic, Inc.
1025 Pulse
1467 REALVIZ S.A.
2116 Right Hemisphere Ltd.
2011 Savannah College of Art and Design
1401 SGI
1901 Silicon Grail
1111 Softimage Co.

1731 Sony Pictures Imageworks Inc.
1201 Sun Microsystems, Inc.
2453 The Austrian Trade Commission
839 Toon Boom Technologies, Inc.
719 Trolltech
1261 Turbo Squid, Inc.
2351 UCLA Extension - Computer Graphics
1611 Viewpoint Corporation
518 Visviva Software, Inc.
1237 Waskul Entertainment

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Booth

2331 2ce, Inc.
1433 2d3 Ltd.
917 3D Metrics, Inc.
1066 3D Nature, LLC
1908 3D Pipeline Corporation
929 3D World
1423 3Dlabs Inc. Ltd.
2439 3D-Online
459 Academy of Digital Animation
2122 Activeworlds, Inc.
1036 Addison Wesley-New Riders Publishing
1637 Adobe Systems, Inc.
1014 Advanced Media Production
1601 Alias|Wavefront
701 AMD
959 American Paper Optics, Inc.
2235 ArchVision
546 Areté Entertainment, Inc.
1167 ARIUS3D Inc.
2416 Artabel
937 Artbeats Digital Film Library
971 Artbyte Magazine
617 ATI Technologies Inc.
2037 auto.des.sys, Inc.
1950 Bionatics SA
746 Blizzard Entertainment
2438 Boris FX
558 Bournemouth University, Bournemouth Media School
1059 BOXX Technologies, Inc.
847 Cambridge Animation Systems

1000 CELCO
767 CG2, Inc.
1910 Charles River Media
514 Chyron Corporation
1101 Compaq Computer Corporation
1030 Computer Graphics Systems Development Corporation
1909 Computer Graphics World
1837 Creation Engine LLC
713 Curious Labs, Inc.
1926 Curious Software Company Ltd.
747 Cybelius Software Inc.
2000 Cycore
2165 Cyra Technologies, Inc.
1050 Darkling Simulations
1760 Deep Video Imaging Ltd.
1034 Desktop Images
1361 Digimation, Inc.
2448 Digital Domain, Inc.
2001 Digital Immersion Software Corporation
2317 Digital Voodoo Australia Pty Ltd
1247 Discreet
1147 DPS/Leitch, Inc.
2057 Electric Image, Inc.
1560 Electronic Arts
801 Elumens Corporation
1767 EON Reality, Inc.
827 Eovia
1447 Eyematic Interfaces Inc.
2008 eyeon Software Inc.
331 Eyetronics
2026 Fakespace Systems Inc.
2231 GDL Technology
405 GOMID, Inc.
1915 Hash Inc.
552 headus (metamorphosis) Pty Ltd
1135 Hewlett-Packard Company
2321 Holoverse/FantasticLight
529 IMAGICA Corp.
2159 Immersive Technologies
511 InSpec inc.
935 IntegrityWare, Inc.
2100 i-O Display Systems, LLC
2347 Joseph Alter, Inc.
539 JourneyEd.com
1159 Kaydara, Inc.
961 Kelseus Ltd.
2411 Khronos Group

510 Lake Technology Corporation
1659 LightWork Design Limited
1805 Linker Systems, Inc.
1855 Many Worlds Productions
1430 Maxon Computer Inc.
1766 MENSII, Inc.
967 Meta Motion
1231 MindAvenue Inc.
2418 Minolta Corporation
1833 NEC Computers, Inc.
1125 NewTek
2441 Next Limit SL
1661 NxView Technologies, Inc.
1904 Okino Computer Graphics, Inc.
2167 OpenSG Forum
753 Opticore
2166 PatternComputing Ltd
727 Phoenix Technologies Incorporated
1375 Phoenix Tools S.r.l.
813 Pixologic, Inc.
611 pmG Worldwide, LLC
1025 Pulse
833 Raindrop Geomagic, Inc.
931 Reachin Technologies AB
1467 REALVIZ S.A.
517 RichFX, Inc.
2116 Right Hemisphere Ltd.
2011 Savannah College of Art and Design
1825 Sense8
1960 SGDL Systems, Inc.
1401 SGI
1966 Singular Inversions
1111 Softimage Co.
2328 Solid Modeling Solutions
1731 Sony Pictures Imageworks Inc.
1967 Steamboat Software, Inc.
1201 Sun Microsystems, Inc.
2324 Superscape
1921 SynaPix
1855 Technical Animations, Inc.
425 TGS, Inc.
2453 The Austrian Trade Commission
951 The3DShop.com
719 Trolltech
1261 Turbo Squid, Inc.
2351 UCLA Extension - Computer Graphics
325 UGS

1611 Viewpoint Corporation
 311 Virtue3D
 518 Visviva Software, Inc.
 2450 Vivid Group, Inc.
 1237 Waskul Entertainment
 2029 Web3D Consortium

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Booth

917 3D Metrics, Inc.
 1066 3D Nature, LLC
 929 3D World
 1423 3Dlabs Inc. Ltd.
 2439 3D-Online
 459 Academy of Digital Animation
 2122 Activeworlds, Inc.
 1036 Addison Wesley-New Riders Publishing
 1637 Adobe Systems, Inc.
 1601 Alias/Wavefront
 701 AMD
 546 Areté Entertainment, Inc.
 617 ATI Technologies Inc.
 2037 auto.des.sys, Inc.
 733 Big Idea Productions
 1950 Bionatics SA
 746 Blizzard Entertainment
 447 Blue Sky Studios, Inc.
 558 Bournemouth University, Bournemouth Media School
 535 CCT International
 2067 Cebas Computer
 767 CG2, Inc.
 1910 Charles River Media
 1101 Compaq Computer Corporation
 1030 Computer Graphics Systems Development Corporation
 1909 Computer Graphics World
 1837 Creation Engine LLC
 747 Cybelius Software Inc.
 2000 Cycore
 2165 Cyra Technologies, Inc.
 1760 Deep Video Imaging Ltd.
 1034 Desktop Images
 1361 Digimation, Inc.
 2448 Digital Domain, Inc.
 2001 Digital Immersion Software Corporation
 1247 Discreet
 2057 Electric Image, Inc.
 1560 Electronic Arts
 801 Elumens Corporation
 827 Eovia
 2353 Essential Reality, LLC.
 1447 Eyematic Interfaces Inc.

331 Eyetronics
 2026 Fakespace Systems Inc.
 2017 Gentle Giant Studios
 405 GOMID, Inc.
 1915 Hash Inc.
 552 headus (metamorphosis) Pty Ltd.
 1135 Hewlett-Packard Company
 2321 Holoverse/FantasticLight
 529 IMAGICA Corp.
 1755 Immersion Corporation
 511 InSpeck inc.
 935 IntegrityWare, Inc.
 2020 interzart AG 3D COMMERCE
 539 JourneyEd.com
 961 Kelseus Ltd.
 1659 LightWork Design Limited
 1058 Mainframe Entertainment, Inc.
 1855 Many Worlds Productions
 1430 Maxon Computer Inc.
 1766 MENSİ, Inc.
 1231 MindAvenue Inc.
 2418 Minolta Corporation
 1833 NEC Computers, Inc.
 1125 NewTek
 1661 NxView Technologies, Inc.
 2136 OES/ITRI
 1375 Phoenix Tools S.r.l.
 813 Pixologic, Inc.
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 1936 Purdue University Department of Computer Graphics Technology
 833 Raindrop Geomagic, Inc.
 1467 REALVIZ S.A.
 517 RichFX, Inc.
 2116 Right Hemisphere Ltd.
 1866 Roland DGA Corporation
 1647 SensAble Technologies, Inc.
 1825 Sense8
 1960 SGDL Systems, Inc.
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 1966 Singular Inversions
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 2328 Solid Modeling Solutions
 1851 Solidscape, Inc.
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 2305 Stratasy Inc.
 2324 Superscape
 1921 SynaPix
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 951 The3DShop.com
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 325 UGS
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 311 Virtue3D
 518 Visviva Software, Inc.
 2029 Web3D Consortium
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 747 Cybelius Software Inc.
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 801 Elumens Corporation
 2026 Fakespace Systems Inc.
 1955 Flow Analysis, Inc.
 2321 Holoverse/FantasticLight
 1755 Immersion Corporation
 2411 Khronos Group
 510 Lake Technology Corporation
 1766 MENSİ, Inc.
 2418 Minolta Corporation
 1833 NEC Computers, Inc.

2441 Next Limit SL
 1661 NxView Technologies, Inc.
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 1825 Sense8
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 929 3D World
 1423 3Dlabs Inc. Ltd.
 2439 3D-Online
 411 5DT (Fifth Dimension Technologies)
 459 Academy of Digital Animation
 2122 Activeworlds, Inc.
 1036 Addison Wesley-New Riders Publishing
 1637 Adobe Systems, Inc.
 1014 Advanced Media Production
 1601 Alias/Wavefront
 701 AMD
 2235 ArchVision
 546 Areté Entertainment, Inc.
 937 Artbeats Digital Film Library
 971 Artbyte Magazine
 617 ATI Technologies Inc.
 2163 AXA Software/netGuru Inc.
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 733 Big Idea Productions
 1950 Bionatics SA
 746 Blizzard Entertainment
 447 Blue Sky Studios, Inc.
 2438 Boris FX
 558 Bournemouth University, Bournemouth Media School
 1059 BOXX Technologies, Inc.
 847 Cambridge Animation Systems
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 1000 CELCO
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 514 Chyron Corporation

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|---|---|--|-------------------------------|
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| 713 Curious Labs, Inc. | 1375 Phoenix Tools S.r.l. | 1837 Creation Engine LLC | |
| 1926 Curious Software Company Ltd. | 2038 Pixar Animation Studios | 1933 Cyberware | |
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| 2000 Cycore | 1025 Pulse | 1034 Desktop Images | |
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| 1034 Desktop Images | 1467 REALVIZ S.A. | 801 Elumens Corporation | |
| 1361 Digimation, Inc. | 517 RichFX, Inc. | 1767 EON Reality, Inc. | |
| 2001 Digital Immersion Software Corporation | 2116 Right Hemisphere Ltd. | 827 Eovia | |
| 2317 Digital Voodoo Australia Pty Ltd | 2011 Savannah College of Art and Design | 2353 Essential Reality, LLC. | |
| 1247 Discreet | 1960 SGD Systems, Inc. | 2026 Fakespace Systems Inc. | |
| 1147 DPS/Leitch, Inc. | 1401 SGI | 1955 Flow Analysis, Inc. | |
| 2057 Electric Image, Inc. | 2311 Sheridan College | 2231 GDL Technology | |
| 1560 Electronic Arts | 1901 Silicon Grail | 1915 Hash Inc. | |
| 801 Elumens Corporation | 2068 SIMI Reality Motion Systems GmbH | 2321 Holoverse/FantasticLight | |
| 827 Eovia | 1111 Softimage Co. | 529 IMAGICA Corp. | |
| 2353 Essential Reality, LLC. | 2328 Solid Modeling Solutions | 935 IntegrityWare, Inc. | |
| 1447 Eyematic Interfaces Inc. | 1731, Sony Pictures Imageworks Inc. | 539 JourneyEd.com | |
| 2008 eyeon Software Inc. | 1737 | 510 Lake Technology Corporation | |
| 331 Eyetronics | 1667 Spatial Integrated Systems, Inc. | 1659 LightWork Design Limited | |
| 1970 Finley-Holiday Film Corporation | 1927, Square USA, Inc. | 1766 MENS, Inc. | |
| 2017 Gentle Giant Studios | 1166 | 1833 NEC Computers, Inc. | |
| 2136 GoPo Media (Junior Land Co. Ltd) | 1201 Sun Microsystems, Inc. | 1904 Okino Computer Graphics, Inc. | |
| 1915 Hash Inc. | 1921 SynaPix | 2166 PatternComputing Ltd | |
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| 1135 Hewlett-Packard Company | 425 TGS, Inc. | 517 RichFX, Inc. | |
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| 1755 Immersion Corporation | 839 Toon Boom Technologies, Inc. | 1825 Sense8 | |
| 511 InSpeck inc. | 1261 Turbo Squid, Inc. | 1960 SGD Systems, Inc. | |
| 935 IntegrityWare, Inc. | 2351 UCLA Extension - Computer Graphics | 1111 Softimage Co. | |
| 2347 Joseph Alter, Inc. | 325 UGS | 1201 Sun Microsystems, Inc. | |
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| 961 Kelseus Ltd. | 518 Visviva Software, Inc. | 2351 UCLA Extension - Computer Graphics | |
| 2411 Khronos Group | 2450 Vivid Group, Inc. | 2014 Virtools SA | |
| 1805 Linker Systems, Inc. | 1237 Waskul Entertainment | 518 Visviva Software, Inc. | |
| 1058 Mainframe Entertainment, Inc. | | 2450 Vivid Group, Inc. | |
| 1855 Many Worlds Productions | | | |
| 1430 Maxon Computer Inc. | | | |
| 853 MediaPEGS | | | |
| 1766 MENS, Inc. | | | |
| 967 Meta Motion | | | |
| 1231 MindAvenue Inc. | | | |
| 2418 Minolta Corporation | | | |
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| 1837 Creation Engine LLC |
| 2000 Cycore |
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| 1767 EON Reality, Inc. |
| 827 Eovia |
| 1447 Eyematic Interfaces Inc. |
| 405 GOMID, Inc. |
| 1135 Hewlett-Packard Company |
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| 2020 interzart AG 3D COMMERCE |
| 539 JourneyEd.com |
| 1159 Kaydara, Inc. |
| 1231 MindAvenue Inc. |
| 1904 Okino Computer Graphics, Inc. |
| 1375 Phoenix Tools S.r.l. |
| 339 ProMax Systems, Inc. |
| 1025 Pulse |
| 931 Reachin Technologies AB |
| 2116 Right Hemisphere Ltd. |
| 2011 Savannah College of Art and Design |
| 1825 Sense8 |
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| 1111 Softimage Co. |
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| 2351 UCLA Extension - Computer Graphics |
| 2014 Virtools SA |
| 518 Visviva Software, Inc. |
| 2450 Vivid Group, Inc. |

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| 746 Blizzard Entertainment |
| 558 Bournemouth University, Bournemouth Media School |
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| 2418 Minolta Corporation |
| 2166 PatternComputing Ltd |

Architecture Applications

Booth

- | |
|-------------------------|
| 1433 2d3 Ltd. |
| 1066 3D Nature, LLC |
| 929 3D World |
| 1423 3Dlabs Inc. Ltd. |
| 2439 3D-Online |
| 2122 Activeworlds, Inc. |
| 2235 ArchVision |
| 2037 auto.des.sys, Inc. |

Broadcast Design Software

Booth

- 1423 3Dlabs Inc. Ltd.
- 514 Chyron Corporation
- 1926 Curious Software Company Ltd.
- 2317 Digital Voodoo Australia Pty Ltd.
- 1247 Discreet
- 827 Eovia
- 2008 eyeon Software Inc.
- 1135 Hewlett-Packard Company
- 539 JourneyEd.com
- 1159 Kaydara, Inc.
- 2411 Khronos Group
- 1430 Maxon Computer Inc.
- 1833 NEC Computers, Inc.
- 1367 Nothing Real LLC
- 2116 Right Hemisphere Ltd.
- 2011 Savannah College of Art and Design
- 1901 Silicon Grail
- 1111 Softimage Co.
- 1201 Sun Microsystems, Inc.
- 1921 SynaPix
- 2453 The Austrian Trade Commission
- 2351 UCLA Extension - Computer Graphics

Business and Financial Graphics

Booth

- 1423 3Dlabs Inc. Ltd.
- 2439 3D-Online
- 514 Chyron Corporation
- 524 Digital Vision Ltd.
- 1247 Discreet
- 827 Eovia
- 2321 Holoverse/FantasticLight
- 539 JourneyEd.com
- 2116 Right Hemisphere Ltd.
- 1825 Sense8
- 2328 Solid Modeling Solutions
- 1201 Sun Microsystems, Inc.
- 2351 UCLA Extension - Computer Graphics

CAD/CAM/CAE/CIM

Booth

- 1066 3D Nature, LLC
- 1423 3Dlabs Inc. Ltd.
- 2122 Activeworlds, Inc.
- 1036 Addison Wesley-New Riders Publishing

- 701 AMD
- 1167 ARIUS3D Inc.
- 617 ATI Technologies Inc.
- 2037 auto.des.sys, Inc.
- 1950 Bionatics SA
- 535 CCT International
- 1909 Computer Graphics World
- 2001 Digital Immersion Software Corporation
- 801 Elumens Corporation
- 2353 Essential Reality, LLC.
- 331 Eyetronics
- 2026 Fakespace Systems Inc.
- 2231 GDL Technology
- 2017 Gentle Giant Studios
- 552 headus (metamorphosis) Pty Ltd.
- 2321 Holoverse/FantasticLight
- 1755 Immersion Corporation
- 511 InSpeck inc.
- 935 IntegrityWare, Inc.
- 539 JourneyEd.com
- 1659 LightWork Design Limited
- 1766 MENSİ, Inc.
- 2418 Minolta Corporation
- 1833 NEC Computers, Inc.
- 2136 OES/ITRI
- 1904 Okino Computer Graphics, Inc.
- 727 Phoenix Technologies Incorporated
- 1936 Purdue University Department of Computer Graphics Technology
- 833 Raindrop Geomagic, Inc.
- 1866 Roland DGA Corporation
- 1825 Sense8
- 1960 SGDL Systems, Inc.
- 1111 Softimage Co.
- 2328 Solid Modeling Solutions
- 1851 Solidscape, Inc.
- 1667 Spatial Integrated Systems, Inc.
- 1201 Sun Microsystems, Inc.
- 1921 SynaPix
- 425 TGS, Inc.
- 325 UGS
- 2029 Web3D Consortium
- 2339 Z Corporation

Commercial Game Engines

Booth

- 1908 3D Pipeline Corporation
- 1423 3Dlabs Inc. Ltd.
- 2122 Activeworlds, Inc.
- 701 AMD

- 1760 Deep Video Imaging Ltd.
- 1560 Electronic Arts
- 1915 Hash Inc.
- 1135 Hewlett-Packard Company
- 961 Kelseus Ltd.
- 1025 Pulse
- 2011 Savannah College of Art and Design
- 2328 Solid Modeling Solutions
- 1201 Sun Microsystems, Inc.
- 1921 SynaPix
- 1611 Viewpoint Corporation
- 2014 Virtools SA
- 518 Visviva Software, Inc.
- 2450 Vivid Group, Inc.

Commercial Game Equipment

Booth

- 1423 3Dlabs Inc. Ltd.
- 536 Actuality Systems, Inc.
- 1059 BOXX Technologies, Inc.
- 1201 Sun Microsystems, Inc.
- 2450 Vivid Group, Inc.

Computer-Video Interfacing

Booth

- 1423 3Dlabs Inc. Ltd.
- 1637 Adobe Systems, Inc.
- 617 ATI Technologies Inc.
- 2329 B&H Photo-Video-Pro Audio Corp.
- 1000 CELCO
- 514 Chyron Corporation
- 1909 Computer Graphics World
- 801 Elumens Corporation
- 827 Eovia
- 2353 Essential Reality, LLC.
- 1135 Hewlett-Packard Company
- 1755 Immersion Corporation
- 539 JourneyEd.com
- 1159 Kaydara, Inc.
- 2411 Khronos Group
- 2166 PatternComputing Ltd
- 2335 Point Grey Research Inc.
- 339 ProMax Systems, Inc.
- 2011 Savannah College of Art and Design
- 1201 Sun Microsystems, Inc.
- 518 Visviva Software, Inc.
- 2450 Vivid Group, Inc.

Conferences and Exhibitions

Booth

- 1054 ACM SIGCHI
- 2122 Activeworlds, Inc.
- 746 Blizzard Entertainment
- 528 Boards Magazine
- 2321 Holoverse/FantasticLight
- 2428 Panoram Technologies, Inc.
- 1936 Purdue University Department of Computer Graphics Technology
- 437 RES Media Group, Inc.
- 2011 Savannah College of Art and Design
- 905 SMPTE

Consulting

Booth

- 1908 3D Pipeline Corporation
- 2439 3D-Online
- 411 5DT (Fifth Dimension Technologies)
- 971 Artbyte Magazine
- 1035 BARCO Projection Systems America
- 1950 Bionatics SA
- 1030 Computer Graphics Systems Development Corporation
- 2165 Cyra Technologies, Inc.
- 1050 Darkling Simulations
- 523 Dynamic Digital Depth
- 801 Elumens Corporation
- 1859 FCS Control Systems BV
- 1955 Flow Analysis, Inc.
- 2231 GDL Technology
- 1135 Hewlett-Packard Company
- 2321 Holoverse/FantasticLight
- 1755 Immersion Corporation
- 957 L H Computer Services
- 1805 Linker Systems, Inc.
- 967 Meta Motion
- 1661 NxView Technologies, Inc.
- 1375 Phoenix Tools S.r.l.
- 611 pmG Worldwide, LLC
- 2335 Point Grey Research Inc.
- 1936 Purdue University Department of Computer Graphics Technology
- 931 Reachin Technologies AB
- 955 Scientific Placement, Inc.
- 1960 SGDL Systems, Inc.
- 1401 SGI
- 1111 Softimage Co.
- 2328 Solid Modeling Solutions

- 1667 Spatial Integrated Systems, Inc.
- 1967 Steamboat Software, Inc.
- 1201 Sun Microsystems, Inc.
- 425 TGS, Inc.
- 1647 Trimension Systems
- 325 UGS
- 1611 Viewpoint Corporation
- 1046 Workstation Users Alliance, Inc.

Contract Graphics/ Programming

Booth

- 1908 3D Pipeline Corporation
- 2439 3D-Online
- 411 5DT (Fifth Dimension Technologies)
- 2122 Activeworlds, Inc.
- 959 American Paper Optics, Inc.
- 747 Cybelius Software Inc.
- 1755 Immersion Corporation
- 1805 Linker Systems, Inc.
- 1058 Mainframe Entertainment, Inc.
- 2441 Next Limit SL
- 1661 NxView Technologies, Inc.
- 1375 Phoenix Tools S.r.l.
- 1936 Purdue University Department of Computer Graphics Technology
- 2023 Rhythm & Hues Studios
- 1825 Sense8
- 1667 Spatial Integrated Systems, Inc.
- 1967 Steamboat Software, Inc.
- 2324 Superscape
- 1855 Technical Animations, Inc.
- 425 TGS, Inc.
- 1611 Viewpoint Corporation
- 2450 Vivid Group, Inc.

Data Analysis

Booth

- 2439 3D-Online
- 535 CCT International
- 2026 Fakespace Systems Inc.
- 1955 Flow Analysis, Inc.
- 2418 Minolta Corporation
- 2166 PatternComputing Ltd
- 2068 SIMI Reality Motion Systems GmbH
- 425 TGS, Inc.

Desktop Publishing

Booth

- 929 3D World
- 1423 3Dlabs Inc. Ltd.
- 1637 Adobe Systems, Inc.
- 701 AMD
- 2235 ArchVision
- 971 Artbyte Magazine
- 617 ATI Technologies Inc.
- 733 Big Idea Productions
- 1030 Computer Graphics Systems Development Corporation
- 1837 Creation Engine LLC
- 2001 Digital Immersion Software Corporation
- 524 Digital Vision Ltd.
- 827 Eovia
- 2008 eyeon Software Inc.
- 539 JourneyEd.com
- 2128 Macromedia, Inc.
- 1125 NewTek
- 1006 Sonic Desktop Software
- 1201 Sun Microsystems, Inc.
- 2453 The Austrian Trade Commission
- 951 The3DShop.com
- 2351 UCLA Extension - Computer Graphics

Desktop Video Production Software

Booth

- 1423 3Dlabs Inc. Ltd.
- 1637 Adobe Systems, Inc.
- 701 AMD
- 937 Artbeats Digital Film Library
- 617 ATI Technologies Inc.
- 733 Big Idea Productions
- 2438 Boris FX
- 1059 BOXX Technologies, Inc.
- 1910 Charles River Media
- 514 Chyron Corporation
- 1101 Compaq Computer Corporation
- 1909 Computer Graphics World
- 1837 Creation Engine LLC
- 1926 Curious Software Company Ltd.
- 2001 Digital Immersion Software Corporation
- 524 Digital Vision Ltd.
- 2317 Digital Voodoo Australia Pty Ltd.
- 1247 Discreet
- 1147 DPS/Leitch, Inc.
- 827 Eovia
- 2008 eyeon Software Inc.
- 1135 Hewlett-Packard Company

- 529 IMAGICA Corp.
- 539 JourneyEd.com
- 2411 Khronos Group
- 1805 Linker Systems, Inc.
- 1367 Nothing Real LLC
- 2166 PatternComputing Ltd
- 339 ProMax Systems, Inc.
- 2116 Right Hemisphere Ltd.
- 2011 Savannah College of Art and Design
- 1901 Silicon Grail
- 1111 Softimage Co.
- 1006 Sonic Desktop Software
- 1201 Sun Microsystems, Inc.
- 951 The3DShop.com
- 1939 VFX Software
- 1237 Waskul Entertainment

Digital Cameras

Booth

- 971 Artbyte Magazine
- 2329 B&H Photo-Video-Pro Audio Corp.
- 1000 CELCO
- 1909 Computer Graphics World
- 1135 Hewlett-Packard Company
- 539 JourneyEd.com
- 1631 Motion Analysis.com
- 2335 Point Grey Research Inc.
- 339 ProMax Systems, Inc.
- 2011 Savannah College of Art and Design
- 2058 SpheronVR AG
- 1201 Sun Microsystems, Inc.
- 951 The3DShop.com
- 2351 UCLA Extension - Computer Graphics

Digital Imaging

Booth

- 917 3D Metrics, Inc.
- 1423 3Dlabs Inc. Ltd.
- 2122 Activeworlds, Inc.
- 1036 Addison Wesley-New Riders Publishing
- 1637 Adobe Systems, Inc.
- 701 AMD
- 546 Areté Entertainment, Inc.
- 1167 ARIUS3D Inc.
- 971 Artbyte Magazine
- 617 ATI Technologies Inc.
- 2329 B&H Photo-Video-Pro Audio Corp.
- 733 Big Idea Productions
- 1950 Bionatics SA
- 847 Cambridge Animation Systems
- 1000 CELCO

- 1030 Computer Graphics Systems Development Corporation
- 1909 Computer Graphics World
- 1837 Creation Engine LLC
- 713 Curious Labs, Inc.
- 2000 Cycore
- 2165 Cyra Technologies, Inc.
- 2001 Digital Immersion Software Corporation
- 524 Digital Vision Ltd.
- 523 Dynamic Digital Depth
- 827 Eovia
- 2008 eyeon Software Inc.
- 331 Eyetronics
- 2219 Film & Video Equipment Ltd.
- 2017 Gentle Giant Studios
- 1915 Hash Inc.
- 2321 Holoverse/FantasticLight
- 529 IMAGICA Corp.
- 1755 Immersion Corporation
- 2159 Immersive Technologies
- 1805 Linker Systems, Inc.
- 2418 Minolta Corporation
- 1367 Nothing Real LLC
- 601 NTT Network Innovation Laboratories
- 753 Opticore
- 2166 PatternComputing Ltd.
- 727 Phoenix Technologies Incorporated
- 1375 Phoenix Tools S.r.l.
- 2335 Point Grey Research Inc.
- 833 Raindrop Geomagic, Inc.
- 1467 REALVIZ S.A.
- 2116 Right Hemisphere Ltd.
- 1901 Silicon Grail
- 1111 Softimage Co.
- 1667 Spatial Integrated Systems, Inc.
- 2058 SpheronVR AG
- 1201 Sun Microsystems, Inc.
- 425 TGS, Inc.
- 2453 The Austrian Trade Commission
- 951 The3DShop.com
- 2351 UCLA Extension - Computer Graphics
- 518 Visviva Software, Inc.
- 1237 Waskul Entertainment

Digital Video Hardware

Booth

- 1423 3Dlabs Inc. Ltd.
- 1946 Accom, Inc.
- 547 AJA Video
- 701 AMD
- 971 Artbyte Magazine
- 617 ATI Technologies Inc.
- 2329 B&H Photo-Video-Pro Audio Corp.
- 1035 BARCO Projection Systems America
- 1059 BOXX Technologies, Inc.
- 1000 CELCO
- 1910 Charles River Media
- 514 Chyron Corporation
- 1101 Compaq Computer Corporation
- 2206 da Vinci Systems, Inc.
- 2317 Digital Voodoo Australia Pty Ltd
- 1147 DPS/Leitch, Inc.
- 523 Dynamic Digital Depth
- 801 Elumens Corporation
- 1135 Hewlett-Packard Company
- 539 JourneyEd.com
- 1159 Kaydara, Inc.
- 629 Média Corporation
- 1125 NewTek
- 1701, 1801 NVIDIA Corporation
- 2335 Point Grey Research Inc.
- 339 ProMax Systems, Inc.
- 2011 Savannah College of Art and Design
- 1829 SBS Technologies, Inc.
- 1401 SGI
- 1667 Spatial Integrated Systems, Inc.
- 1201 Sun Microsystems, Inc.
- 1855 Technical Animations, Inc.
- 951 The3DShop.com
- 2351 UCLA Extension - Computer Graphics
- 1237 Waskul Entertainment

Digitizing Cameras

Booth

- 917 3D Metrics, Inc.
- 1752 3rdTech, Inc.
- 701 AMD
- 2329 B&H Photo-Video-Pro Audio Corp.
- 1933 Cyberware
- 2008 eyeon Software Inc.
- 2219 Film & Video Equipment Ltd.
- 1755 Immersion Corporation

- 511 InSpeck inc.
- 1766 MENSII, Inc.
- 2418 Minolta Corporation
- 2136 OES/ITRI
- 2011 Savannah College of Art and Design
- 451 Seeing Machines
- 2351 UCLA Extension - Computer Graphics
- 1611 Viewpoint Corporation

DVD Authoring Tools

Booth

- 1946 Accom, Inc.
- 701 AMD
- 1101 Compaq Computer Corporation
- 1760 Deep Video Imaging Ltd.
- 2317 Digital Voodoo Australia Pty Ltd
- 1147 DPS/Leitch, Inc.
- 1060 Microboards Technology LLC
- 339 ProMax Systems, Inc.
- 2011 Savannah College of Art and Design
- 951 The3DShop.com
- 2351 UCLA Extension - Computer Graphics
- 1237 Waskul Entertainment

Education/Training

Booth

- 2439 3D-Online
- 411 5DT (Fifth Dimension Technologies)
- 459 Academy of Digital Animation
- 2122 Activeworlds, Inc.
- 1014 Advanced Media Production
- 971 Artbyte Magazine
- 2163 AXA Software /netGuru Inc.
- 1035 BARCO Projection Systems America
- 1950 Bionatics SA
- 528 Boards Magazine
- 558 Bournemouth University, Bournemouth Media School
- 2067 Cebas Computer
- 2414 Cogswell College
- 2165 Cyra Technologies, Inc.
- 1028 Desktop Engineering Magazine
- 1034 Desktop Images
- 2227 Ex'pression Center for New Media

- 2008 eyeon Software Inc.
- 739 Gnomon School of Visual Effects
- 2128 Macromedia, Inc.
- 1855 Many Worlds Productions
- 439 Oregon3D, Inc.
- 2428 Panoram Technologies, Inc.
- 1012 Parallax Inc.
- 1936 Purdue University Department of Computer Graphics Technology
- 2011 Savannah College of Art and Design
- 1825 Sense8
- 1960 SGD Systems, Inc.
- 1401 SGI
- 2311 Sheridan College
- 1111 Softimage Co.
- 2328 Solid Modeling Solutions
- 1851 Solidscape, Inc.
- 1201 Sun Microsystems, Inc.
- 2324 Superscape
- 1855 Technical Animations, Inc.
- 425 TGS, Inc.
- 911 The Art Institutes
- 550 Total Training
- 2351 UCLA Extension - Computer Graphics
- 325 UGS
- 1900 University of Advancing Computer Technology
- 1831 Vancouver Film School
- 1611 Viewpoint Corporation
- 518 Visviva Software, Inc.

Electronic Publishing

Booth

- 1423 3Dlabs Inc. Ltd.
- 1637 Adobe Systems, Inc.
- 701 AMD
- 971 Artbyte Magazine
- 1910 Charles River Media
- 1837 Creation Engine LLC
- 2000 Cycore
- 1560 Electronic Arts
- 827 Eovia
- 1447 Eyematic Interfaces Inc.
- 2008 eyeon Software Inc.
- 2231 GDL Technology
- 539 JourneyEd.com
- 2116 Right Hemisphere Ltd.
- 1201 Sun Microsystems, Inc.
- 2351 UCLA Extension - Computer Graphics
- 518 Visviva Software, Inc.
- 1237 Waskul Entertainment

Encoders/Decoders

Booth

- 547 AJA Video
- 701 AMD
- 617 ATI Technologies Inc.
- 514 Chyron Corporation
- 1147 DPS/Leitch, Inc.
- 523 Dynamic Digital Depth
- 2411 Khronos Group
- 1060 Microboards Technology LLC
- 517 RichFX, Inc.
- 1960 SGD Systems, Inc.
- 951 The3DShop.com

Encoders/Decoders-HW

Booth

- 701 AMD
- 617 ATI Technologies Inc.
- 514 Chyron Corporation
- 1147 DPS/Leitch, Inc.
- 1135 Hewlett-Packard Company
- 510 Lake Technology Corporation
- 1060 Microboards Technology LLC
- 1201 Sun Microsystems, Inc.
- 951 The3DShop.com

Engineering Applications

Booth

- 1066 3D Nature, LLC
- 1423 3Dlabs Inc. Ltd.
- 411 5DT (Fifth Dimension Technologies)
- 2122 Activeworlds, Inc.
- 1167 ARIUS3D Inc.
- 2037 auto.des.sys, Inc.
- 1950 Bionatics SA
- 535 CCT International
- 1030 Computer Graphics Systems Development Corporation
- 2165 Cyra Technologies, Inc.
- 2001 Digital Immersion Software Corporation
- 1767 EON Reality, Inc.
- 2026 Fakespace Systems Inc.
- 1955 Flow Analysis, Inc.
- 1755 Immersion Corporation
- 935 IntegrityWare, Inc.
- 539 JourneyEd.com
- 510 Lake Technology Corporation
- 1766 MENSII, Inc.

- 1833 NEC Computers, Inc.
- 2441 Next Limit SL
- 1904 Okino Computer Graphics, Inc.
- 753 Opticore
- 833 Raindrop Geomagic, Inc.
- 1825 Sense8
- 1960 SGDL Systems, Inc.
- 1401 SGI
- 2328 Solid Modeling Solutions
- 425 TGS, Inc.
- 433 Trolltech
- 325 UGS
- 2029 Web3D Consortium

Furniture

Booth

- 1914 Anthro Corporation
- 971 Artbyte Magazine
- 1861 Biomorph Interactive Desk
- 951 The3DShop.com

Geographic Information Systems

Booth

- 1423 3Dlabs Inc. Ltd.
- 536 Actuality Systems, Inc.
- 1766 MENSİ, Inc.
- 1201 Sun Microsystems, Inc.

Geographic Information Systems-HW

Booth

- 1066 3D Nature, LLC
- 1423 3Dlabs Inc. Ltd.
- 2122 Activeworlds, Inc.
- 1950 Bionatics SA
- 1030 Computer Graphics Systems Development Corporation
- 2165 Cyra Technologies, Inc.
- 1135 Hewlett-Packard Company
- 1201 Sun Microsystems, Inc.

Graphic Design Systems

Booth

- 1423 3Dlabs Inc. Ltd.
- 2122 Activeworlds, Inc.
- 1637 Adobe Systems, Inc.
- 1601 Alias/Wavefront
- 701 AMD
- 2416 Artabel
- 971 Artbyte Magazine
- 2037 auto.des.sys, Inc.
- 1059 BOXX Technologies, Inc.
- 514 Chyron Corporation
- 1909 Computer Graphics World
- 1926 Curious Software Company Ltd.
- 1760 Deep Video Imaging Ltd.
- 801 Elumens Corporation
- 827 Eovia
- 2008 eyeon Software Inc.
- 2321 Holoverse/FantasticLight
- 539 JourneyEd.com
- 1367 Nothing Real LLC
- 753 Opticore
- 2116 Right Hemisphere Ltd.
- 1901 Silicon Grail
- 2328 Solid Modeling Solutions
- 1201 Sun Microsystems, Inc.
- 425 TGS, Inc.
- 2351 UCLA Extension - Computer Graphics
- 518 Visviva Software, Inc.

Graphics Accelerator Boards

Booth

- 1423 3Dlabs Inc. Ltd.
- 2416 Artabel
- 617 ATI Technologies Inc.
- 1101 Compaq Computer Corporation
- 1909 Computer Graphics World
- 2317 Digital Voodoo Australia Pty Ltd
- 1135 Hewlett-Packard Company
- 539 JourneyEd.com
- 2411 Khronos Group
- 1833 NEC Computers, Inc.
- 339 ProMax Systems, Inc.
- 2116 Right Hemisphere Ltd.
- 2011 Savannah College of Art and Design
- 1960 SGDL Systems, Inc.
- 1401 SGI
- 1201 Sun Microsystems, Inc.
- 1921 SynaPix
- 951 The3DShop.com

Graphics Accelerator Boards-HW

Booth

- 1423 3Dlabs Inc. Ltd.
- 701 AMD
- 2416 Artabel
- 617 ATI Technologies Inc.
- 1101 Compaq Computer Corporation
- 1909 Computer Graphics World
- 2317 Digital Voodoo Australia Pty Ltd
- 801 Elumens Corporation
- 1135 Hewlett-Packard Company
- 2211 Matrox Graphics Inc.
- 1833 NEC Computers, Inc.
- 1701, 1801 NVIDIA Corporation
- 2011 Savannah College of Art and Design
- 1201 Sun Microsystems, Inc.
- 1921 SynaPix
- 951 The3DShop.com
- 1046 Workstation Users Alliance, Inc.

Graphics Standards Software

Booth

- 1908 3D Pipeline Corporation
- 1423 3Dlabs Inc. Ltd.
- 617 ATI Technologies Inc.
- 1950 Bionatics SA
- 514 Chyron Corporation
- 827 Eovia
- 2136 GoPo Media (Junior Land Co. Ltd)
- 2411 Khronos Group
- 1367 Nothing Real LLC
- 1960 SGDL Systems, Inc.
- 1901 Silicon Grail
- 1201 Sun Microsystems, Inc.
- 425 TGS, Inc.
- 2453 The Austrian Trade Commission
- 2029 Web3D Consortium

GroupWare

Booth

- 1201 Sun Microsystems, Inc.

GroupWare Software

Booth

- 2165 Cyra Technologies, Inc.
- 1805 Linker Systems, Inc.
- 1201 Sun Microsystems, Inc.

Haptic Input Devices

Booth

- 1909 Computer Graphics World
- 1859 FCS Control Systems BV
- 1135 Hewlett-Packard Company
- 1755 Immersion Corporation
- 931 Reachin Technologies AB
- 1647 SensAble Technologies, Inc.
- 530 Tactex Controls Inc.

HDTV

Booth

- 523 4D-Vision GmbH
- 1946 Accom, Inc.
- 547 AJA Video
- 701 AMD
- 617 ATI Technologies Inc.
- 2329 B&H Photo-Video-Pro Audio Corp.
- 1059 BOXX Technologies, Inc.
- 1000 CELCO
- 514 Chyron Corporation
- 2206 da Vinci Systems, Inc.
- 2317 Digital Voodoo Australia Pty Ltd
- 1147 DPS/Leitch, Inc.
- 2008 eyeon Software Inc.
- 2321 Holoverse/FantasticLight
- 1367 Nothing Real LLC
- 601 NTT Network Innovation Laboratories
- 1701, 1801 NVIDIA Corporation
- 339 ProMax Systems, Inc.
- 2011 Savannah College of Art and Design
- 1401 SGI
- 1201 Sun Microsystems, Inc.
- 1237 Waskul Entertainment

Head Mounted Displays

Booth

- 523 4D-Vision GmbH
- 411 5DT (Fifth Dimension Technologies)
- 1030 Computer Graphics Systems Development Corporation
- 1909 Computer Graphics World
- 2321 Holoverse/FantasticLight

2100 i-O Display Systems, LLC
 967 Meta Motion
 1924 n-Vision

High Performance Graphics Processors

Booth

1423 3Dlabs Inc. Ltd.
 2416 Artabel
 617 ATI Technologies Inc.
 1000 CELCO
 514 Chyron Corporation
 1909 Computer Graphics World
 2165 Cyra Technologies, Inc.
 1567 InterSense, Incorporated
 2211 Matrox Graphics Inc.
 2011 Savannah College of Art and Design
 1201 Sun Microsystems, Inc.
 2351 UCLA Extension - Computer Graphics
 1046 Workstation Users Alliance, Inc.
 2447 XS International, Inc.

High Resolution Technologies

Booth

917 3D Metrics, Inc.
 1423 3Dlabs Inc. Ltd.
 1752 3rdTech, Inc.
 536 Actuality Systems, Inc.
 701 AMD
 1167 ARIUS3D Inc.
 1035 BARCO Projection Systems America
 1059 BOXX Technologies, Inc.
 1000 CELCO
 514 Chyron Corporation
 2206 da Vinci Systems, Inc.
 1760 Deep Video Imaging Ltd.
 801 Elumens Corporation
 2026 Fakespace Systems Inc.
 2219 Film & Video Equipment Ltd.
 2321 Holoverse/FantasticLight
 1567 InterSense, Incorporated
 1815 Minicomputer Exchange, Inc.
 601 NTT Network Innovation Laboratories
 1701, 1801 NVIDIA Corporation
 2451 OTT-LITE Technology
 2428 Panoram Technologies, Inc.
 1401 SGI
 2058 SpheronVR AG
 1201 Sun Microsystems, Inc.

1647 Trimension Systems
 2351 UCLA Extension - Computer Graphics
 2447 XS International, Inc.

Image Based Modeling

Booth

459 Academy of Digital Animation
 1036 Addison Wesley-New Riders Publishing
 1637 Adobe Systems, Inc.
 2235 ArchVision
 1167 ARIUS3D Inc.
 1030 Computer Graphics Systems Development Corporation
 2000 Cycore
 2165 Cyra Technologies, Inc.
 2057 Electric Image, Inc.
 827 Eovia
 1447 Eyematic Interfaces Inc.
 2321 Holoverse/FantasticLight
 1755 Immersion Corporation
 2159 Immersive Technologies
 2020 interzart AG 3D COMMERCE
 961 Kelseus Ltd.
 2166 PatternComputing Ltd
 2335 Point Grey Research Inc.
 1467 REALVIZ S.A.
 2116 Right Hemisphere Ltd.
 1966 Singular Inversions
 2328 Solid Modeling Solutions
 1921 SynaPix
 425 TGS, Inc.
 2351 UCLA Extension - Computer Graphics
 518 Visviva Software, Inc.

Image Management

Booth

1637 Adobe Systems, Inc.
 827 Eovia
 2166 PatternComputing Ltd.
 2116 Right Hemisphere Ltd.
 1201 Sun Microsystems, Inc.

Industrial Design

Booth

1601 Alias/Wavefront
 971 Artbyte Magazine
 2037 auto.des.sys, Inc.
 1909 Computer Graphics World
 747 Cybelius Software Inc.
 1933 Cyberware
 2165 Cyra Technologies, Inc.
 2001 Digital Immersion Software Corporation
 827 Eovia
 2008 eyeon Software Inc.
 331 Eyetronics
 1955 Flow Analysis, Inc.
 552 headus (metamorphosis) Pty Ltd.
 1135 Hewlett-Packard Company
 1755 Immersion Corporation
 539 JourneyEd.com
 2418 Minolta Corporation
 601 NTT Network Innovation Laboratories
 1904 Okino Computer Graphics, Inc.
 753 Opticore
 2166 PatternComputing Ltd
 727 Phoenix Technologies Incorporated
 833 Raindrop Geomagic, Inc.
 1960 SGDL Systems, Inc.
 1201 Sun Microsystems, Inc.
 2324 Superscape
 1921 SynaPix
 425 TGS, Inc.
 1647 Trimension Systems
 325 UGS

Information Visualization

Booth

2439 3D-Online
 411 5DT (Fifth Dimension Technologies)
 701 AMD
 2037 auto.des.sys, Inc.
 1035 BARCO Projection Systems America
 535 CCT International
 1030 Computer Graphics Systems Development Corporation
 2000 Cycore
 2165 Cyra Technologies, Inc.
 2001 Digital Immersion Software Corporation
 523 Dynamic Digital Depth
 2057 Electric Image, Inc.
 801 Elumens Corporation
 2008 eyeon Software Inc.

2026 Fakespace Systems Inc.
 1955 Flow Analysis, Inc.
 1755 Immersion Corporation
 2159 Immersive Technologies
 1231 MindAvenue Inc.
 601 NTT Network Innovation Laboratories
 1661 NxView Technologies, Inc.
 1467 REALVIZ S.A.
 1960 SGDL Systems, Inc.
 1401 SGI
 1201 Sun Microsystems, Inc.
 1921 SynaPix
 425 TGS, Inc.
 1647 Trimension Systems
 2351 UCLA Extension - Computer Graphics
 1611 Viewpoint Corporation
 518 Visviva Software, Inc.
 2450 Vivid Group, Inc.
 2029 Web3D Consortium

Input Devices

Booth

1752 3rdTech, Inc.
 411 5DT (Fifth Dimension Technologies)
 1747 Ascension Technology Corporation
 429 Basis Software, Inc.
 1909 Computer Graphics World
 1933 Cyberware
 2165 Cyra Technologies, Inc.
 2001 Digital Immersion Software Corporation
 2353 Essential Reality, LLC.
 2026 Fakespace Systems Inc.
 1956 Fujitsu Takamisawa America, Inc.
 1755 Immersion Corporation
 1567 InterSense, Incorporated
 2020 interzart AG 3D COMMERCE
 2424 Measurand Inc
 1766 MENSI, Inc.
 967 Meta Motion
 2136 OES/ITRI
 727 Phoenix Technologies Incorporated
 2335 Point Grey Research Inc.
 1001 Polhemus, Inc.
 2011 Savannah College of Art and Design
 451 Seeing Machines
 1201 Sun Microsystems, Inc.
 530 Tactex Controls Inc.
 951 The3DShop.com
 2450 Vivid Group, Inc.

- 2147 Wacom Technology Corporation
2447 XS International, Inc.

Interface Tools

Booth

- 1752 3rdTech, Inc.
411 5DT (Fifth Dimension Technologies)
959 American Paper Optics, Inc.
2165 Cyra Technologies, Inc.
1760 Deep Video Imaging Ltd.
1755 Immersion Corporation
1567 InterSense, Incorporated
2451 OTT-LITE Technology
1012 Parallax Inc.
2011 Savannah College of Art and Design
1829 SBS Technologies, Inc.
451 Seeing Machines
530 Tactex Controls Inc.
1647 Trimension Systems
2351 UCLA Extension - Computer Graphics
2450 Vivid Group, Inc.

Mapping and Cartography

Booth

- 1066 3D Nature, LLC
1423 3Dlabs Inc. Ltd.
411 5DT (Fifth Dimension Technologies)
1926 Curious Software Company Ltd
827 Eovia
2008 eyeon Software Inc.
2321 Holoverse/FantasticLight
601 NTT Network Innovation Laboratories
2166 PatternComputing Ltd
1960 SGDL Systems, Inc.
1201 Sun Microsystems, Inc.
425 TGS, Inc.

Medical Imaging Software

Booth

- 1423 3Dlabs Inc. Ltd.
411 5DT (Fifth Dimension Technologies)
1909 Computer Graphics World
713 Curious Labs, Inc.
523 Dynamic Digital Depth
2008 eyeon Software Inc.
331 Eyetronics
1430 Maxon Computer Inc.

- 1833 NEC Computers, Inc.
2441 Next Limit SL
1825 Sense8
2328 Solid Modeling Solutions
1201 Sun Microsystems, Inc.
425 TGS, Inc.

Mobile Computing

Booth

- 971 Artbyte Magazine
617 ATI Technologies Inc.
1909 Computer Graphics World
2165 Cyra Technologies, Inc.
1135 Hewlett-Packard Company
838 MaxVision Corporation
530 Tactex Controls Inc.
951 The3DShop.com

Monitors and Displays

Booth

- 411 5DT (Fifth Dimension Technologies)
536 Actuality Systems, Inc.
1035 BARCO Projection Systems America
1101 Compaq Computer Corporation
1909 Computer Graphics World
1760 Deep Video Imaging Ltd.
2317 Digital Voodoo Australia Pty Ltd
523 Dynamic Digital Depth
801 Elumens Corporation
2026 Fakespace Systems Inc.
1135 Hewlett-Packard Company
2321 Holoverse/FantasticLight
1815 Minicomputer Exchange, Inc.
601 NTT Network Innovation Laboratories
1924 n-Vision
2451 OTT-LITE Technology
2428 Panoram Technologies, Inc.
339 ProMax Systems, Inc.
931 Reachin Technologies AB
2011 Savannah College of Art and Design
1401 SGI
1201 Sun Microsystems, Inc.
951 The3DShop.com
1647 Trimension Systems
2147 Wacom Technology Corporation
1237 Waskul Entertainment
1046 Workstation Users Alliance, Inc.
2447 XS International, Inc.

Motion Capture Equipment

Booth

- 1752 3rdTech, Inc.
411 5DT (Fifth Dimension Technologies)
701 AMD
1747 Ascension Technology Corporation
1909 Computer Graphics World
2353 Essential Reality, LLC.
331 Eyetronics
1135 Hewlett-Packard Company
1755 Immersion Corporation
1567 InterSense, Incorporated
539 JourneyEd.com
2424 Measurand Inc
967 Meta Motion
1631 Motion Analysis.com
727 Phoenix Technologies Incorporated
2335 Point Grey Research Inc.
1001 Polhemus, Inc.
451 Seeing Machines
2068 SIMI Reality Motion Systems GmbH
530 Tactex Controls Inc.
1433 Vicon Motion Systems
2450 Vivid Group, Inc.
2447 XS International, Inc.

Motion Capture Software

Booth

- 1752 3rdTech, Inc.
411 5DT (Fifth Dimension Technologies)
1637 Adobe Systems, Inc.
701 AMD
1909 Computer Graphics World
1560 Electronic Arts
1447 Eyematic Interfaces Inc.
331 Eyetronics
1135 Hewlett-Packard Company
539 JourneyEd.com
1159 Kaydara, Inc.
2424 Measurand Inc
967 Meta Motion
639 MOTTEK Motion Technology, Inc.
1631 Motion Analysis.com
753 Opticore
727 Phoenix Technologies Incorporated
2335 Point Grey Research Inc.
451 Seeing Machines
2068 SIMI Reality Motion Systems GmbH
1111 Softimage Co.

- 2324 Superscape
1921 SynaPix
1433 Vicon Motion Systems
2450 Vivid Group, Inc.

Multimedia Tools and Applications

Booth

- 2331 2ce, Inc.
1066 3D Nature, LLC
2122 Activeworlds, Inc.
1637 Adobe Systems, Inc.
971 Artbyte Magazine
617 ATI Technologies Inc.
2438 Boris FX
847 Cambridge Animation Systems
1910 Charles River Media
514 Chyron Corporation
1101 Compaq Computer Corporation
1909 Computer Graphics World
713 Curious Labs, Inc.
747 Cybelius Software Inc.
2000 Cycore
2165 Cyra Technologies, Inc.
1760 Deep Video Imaging Ltd.
1034 Desktop Images
1247 Discreet
1147 DPS/Leitch, Inc.
523 Dynamic Digital Depth
2057 Electric Image, Inc.
801 Elumens Corporation
1767 EON Reality, Inc.
827 Eovia
1447 Eyematic Interfaces Inc.
2008 eyeon Software Inc.
405 GOMID, Inc.
2136 GoPo Media (Junior Land Co. Ltd)
1915 Hash Inc.
1755 Immersion Corporation
1567 InterSense, Incorporated
2020 interzart AG 3D COMMERCE
539 JourneyEd.com
1159 Kaydara, Inc.
2411 Khronos Group
1805 Linker Systems, Inc.
2128 Macromedia, Inc.
967 Meta Motion
1231 MindAvenue Inc.
1367 Nothing Real LLC
601 NTT Network Innovation Laboratories
1661 NxView Technologies, Inc.
1904 Okino Computer Graphics, Inc.
2166 PatternComputing Ltd

611 pmG Worldwide, LLC
 339 ProMax Systems, Inc.
 1025 Pulse
 1936 Purdue University
 Department of
 Computer Graphics
 Technology

1467 REALVIZ S.A.
 517 RichFX, Inc.
 2116 Right Hemisphere Ltd.
 2011 Savannah College of
 Art and Design
 1825 Sense8
 1960 SGDL Systems, Inc.
 1901 Silicon Grail
 1111 Softimage Co.
 1006 Sonic Desktop Software
 1201 Sun Microsystems, Inc.
 2324 Superscape
 1921 SynaPix
 530 Tactex Controls Inc.
 1855 Technical Animations, Inc.
 1261 Turbo Squid, Inc.
 2351 UCLA Extension -
 Computer Graphics
 1611 Viewpoint Corporation
 2014 Virtools SA
 311 Virtue3D
 518 Visviva Software, Inc.
 2450 Vivid Group, Inc.
 2029 Web3D Consortium

Multimedia Tools and Applications-HW

Booth

1946 Accom, Inc.
 536 Actuality Systems, Inc.
 959 American Paper Optics, Inc.
 1035 BARCO Projection Systems
 America
 514 Chyron Corporation
 1101 Compaq Computer
 Corporation
 1760 Deep Video Imaging Ltd.
 2001 Digital Immersion Software
 Corporation
 1147 DPS/Leitch, Inc.
 801 Elumens Corporation
 1755 Immersion Corporation
 1567 InterSense, Incorporated
 2020 interzart AG 3D
 COMMERCE
 2100 i-O Display Systems, LLC
 2211 Matrox Graphics Inc.
 2451 OTT-LITE Technology
 2428 Panoram Technologies, Inc.
 727 PhoeniX Technologies
 Incorporated
 1201 Sun Microsystems, Inc.
 530 Tactex Controls Inc.

2351 UCLA Extension -
 Computer Graphics
 2450 Vivid Group, Inc.
 1237 Waskul Entertainment

Networking Equipment

Booth

514 Chyron Corporation
 1101 Compaq Computer
 Corporation
 2008 eyeon Software Inc.
 1135 Hewlett-Packard Company
 629 Médéa Corporation
 1815 Minicomputer Exchange,
 Inc.
 601 NTT Network Innovation
 Laboratories
 2011 Savannah College of
 Art and Design
 1829 SBS Technologies, Inc.
 1201 Sun Microsystems, Inc.
 951 The3DShop.com
 1046 Workstation Users Alliance,
 Inc.
 2447 XS International, Inc.

Networking Infrastructure

Booth

405 GOMID, Inc.
 1135 Hewlett-Packard Company
 601 NTT Network Innovation
 Laboratories
 2011 Savannah College of
 Art and Design
 1201 Sun Microsystems, Inc.
 2453 The Austrian Trade
 Commission

OEM Components

Booth

1423 3Dlabs Inc. Ltd.
 547 AJA Video
 701 AMD
 2416 Artabel
 1747 Ascension Technology
 Corporation
 617 ATI Technologies Inc.
 1059 BOXX Technologies, Inc.
 1760 Deep Video Imaging Ltd.
 1956 Fujitsu Takamisawa
 America, Inc.
 1567 InterSense, Incorporated
 2211 Matrox Graphics Inc.
 1833 NEC Computers, Inc.
 1012 Parallax Inc.
 1001 Polhemus, Inc.
 1829 SBS Technologies, Inc.
 1201 Sun Microsystems, Inc.
 530 Tactex Controls Inc.
 1046 Workstation Users Alliance,
 Inc.

Paint Systems

Booth

1947 5D Solutions Limited
 1637 Adobe Systems, Inc.
 2438 Boris FX
 847 Cambridge Animation
 Systems
 514 Chyron Corporation
 1247 Discreet
 1147 DPS/Leitch, Inc.
 2008 eyeon Software Inc.
 1970 Finley-Holiday Film
 Corporation
 2136 GoPo Media
 (Junior Land Co. Ltd)
 2020 interzart AG 3D
 COMMERCE
 1805 Linker Systems, Inc.
 1430 Maxon Computer Inc.
 1125 NewTek
 1367 Nothing Real LLC
 813 Pixologic, Inc.
 2116 Right Hemisphere Ltd.
 1111 Softimage Co.
 1201 Sun Microsystems, Inc.
 839 Toon Boom Technologies,
 Inc.
 2351 UCLA Extension -
 Computer Graphics

Printers and Plotters

Booth

1267 3D Systems, Inc.
 971 Artbyte Magazine
 1000 CELCO
 1909 Computer Graphics World
 1135 Hewlett-Packard Company
 957 L H Computer Services
 2451 OTT-LITE Technology
 1866 Roland DGA Corporation
 1851 Solidscape, Inc.
 951 The3DShop.com
 2351 UCLA Extension -
 Computer Graphics
 1932 Xerox Office Printing
 Business

Projectors

Booth

411 5DT (Fifth Dimension
 Technologies)
 536 Actuality Systems, Inc.
 647 ARRI Inc.
 1035 BARCO Projection Systems
 America
 1909 Computer Graphics World
 1760 Deep Video Imaging Ltd.
 801 Elumens Corporation
 2219 Film & Video Equipment
 Ltd.
 2321 Holoverse/FantasticLight
 601 NTT Network Innovation
 Laboratories
 2011 Savannah College of
 Art and Design
 951 The3DShop.com
 1647 Trimension Systems
 2351 UCLA Extension -
 Computer Graphics
 1237 Waskul Entertainment

Publications

Booth

929 3D World
 1918 A K Peters, Ltd.
 1054 ACM SIGCHI
 1036 Addison Wesley-New
 Riders Publishing
 417 Advanced Imaging
 Magazine
 925 Animation Magazine
 915 ASC-American
 Cinematographer
 528 Boards Magazine
 558 Bournemouth University,
 Bournemouth Media
 School
 1910 Charles River Media
 1909 Computer Graphics World

- 1955 Flow Analysis, Inc.
 2434 Focal Press
 454 IdN Magazine
 1010 IEEE Computer Society
 2032 Morgan Kaufmann Publishers
 1017 PBI Media, LLC.
 1811 Post Magazine (Advanstar Technology Communities)
 1936 Purdue University Department of Computer Graphics Technology
 437 RES Media Group, Inc.
 905 SMPTE
 1018 Springer-Verlag New York, Inc.
 431 Videography Magazine/United Entertainment Media

RAID Systems and Storage

Booth

- 1059 BOXX Technologies, Inc.
 1909 Computer Graphics World
 1004 DISC, Incorporated
 2219 Film & Video Equipment Ltd.
 1135 Hewlett-Packard Company
 1711 Kingston Technology Company
 553 LSI Logic Storage Systems, Inc.
 629 Média Corporation
 1815 Minicomputer Exchange, Inc.
 339 ProMax Systems, Inc.
 1401 SGI
 1201 Sun Microsystems, Inc.
 1024 Texas Memory Systems, Inc.
 951 The3DShop.com
 1046 Workstation Users Alliance, Inc.
 2447 XS International, Inc.

Rendering and Modeling

Booth

- 1066 3D Nature, LLC
 1423 3Dlabs Inc. Ltd.
 2439 3D-Online
 459 Academy of Digital Animation
 2122 Activeworlds, Inc.
 1036 Addison Wesley-New Riders Publishing
 1637 Adobe Systems, Inc.
 1601 Alias/Wavefront
 701 AMD
 2235 ArchVision
 546 Areté Entertainment, Inc.
 2037 auto.des.sys, Inc.
 733 Big Idea Productions
 1950 Bionatics SA
 746 Blizzard Entertainment
 558 Bournemouth University, Bournemouth Media School
 1059 BOXX Technologies, Inc.
 847 Cambridge Animation Systems
 2067 Cebas Computer
 1101 Compaq Computer Corporation
 1909 Computer Graphics World
 1837 Creation Engine LLC
 713 Curious Labs, Inc.
 747 Cybelius Software Inc.
 2000 Cycore
 2165 Cyra Technologies, Inc.
 1050 Darkling Simulations
 2001 Digital Immersion Software Corporation
 1247 Discreet
 523 Dynamic Digital Depth
 2057 Electric Image, Inc.
 1560 Electronic Arts
 801 Elumens Corporation
 827 Eovia
 2008 eyeon Software Inc.
 552 headus (metamorphosis) Pty Ltd
 1135 Hewlett-Packard Company
 1755 Immersion Corporation
 2159 Immersive Technologies
 511 InSpeck inc.
 935 IntegrityWare, Inc.
 2020 interzart AG 3D COMMERCE
 2347 Joseph Alter, Inc.
 539 JourneyEd.com
 961 Kelseus Ltd.
 1659 LightWork Design Limited
 1805 Linker Systems, Inc.
 1855 Many Worlds Productions
 1430 Maxon Computer Inc.
 1766 MENSİ, Inc.
 1231 MindAvenue Inc.
 2418 Minolta Corporation
 1125 NewTek
 2441 Next Limit SL
 1661 NxView Technologies, Inc.
 1904 Okino Computer Graphics, Inc.
 753 Opticore
 2166 PatternComputing Ltd
 1375 Phoenix Tools S.r.l.
 611 pmG Worldwide, LLC
 1025 Pulse

- 931 Reachin Technologies AB
 1467 REALVIZ S.A.
 517 RichFX, Inc.
 2116 Right Hemisphere Ltd.
 2011 Savannah College of Art and Design
 1719 Screamline Rendering Services
 1960 SGDL Systems, Inc.
 1401 SGI
 1111 Softimage Co.
 2328 Solid Modeling Solutions
 1851 Solidscape, Inc.
 1667 Spatial Integrated Systems, Inc.
 2058 SpheronVR AG
 1927, Square USA, Inc.
 1166
 1967 Steamboat Software, Inc.
 1201 Sun Microsystems, Inc.
 2324 Superscape
 1921 SynaPix
 1855 Technical Animations, Inc.
 425 TGS, Inc.
 951 The3DShop.com
 1261 Turbo Squid, Inc.
 2351 UCLA Extension - Computer Graphics
 325 UGS
 1611 Viewpoint Corporation
 311 Virtue3D
 518 Visviva Software, Inc.

Robotics

Booth

- 1918 A K Peters, Ltd.
 2353 Essential Reality, LLC.
 1859 FCS Control Systems BV
 2424 Measurand Inc
 1012 Parallax Inc.

Scan Converters

Booth

- 1909 Computer Graphics World
 523 Dynamic Digital Depth

Scanners

Booth

- 917 3D Metrics, Inc.
 1752 3rdTech, Inc.
 1167 ARIUS3D Inc.
 971 Artbyte Magazine
 429 Basis Software, Inc
 1000 CELCO
 1909 Computer Graphics World
 1933 Cyberware
 2165 Cyra Technologies, Inc.
 331 Eyetronics
 2219 Film & Video Equipment Ltd.
 1135 Hewlett-Packard Company
 529 IMAGICA Corp.
 1755 Immersion Corporation
 511 InSpeck inc.
 2020 interzart AG 3D COMMERCE
 539 JourneyEd.com
 1766 MENSİ, Inc.
 2418 Minolta Corporation
 2136 OES/TRI
 1001 Polhemus, Inc.
 1866 Roland DGA Corporation
 2011 Savannah College of Art and Design
 951 The3DShop.com
 2351 UCLA Extension - Computer Graphics

Scientific Application

Booth

- 1066 3D Nature, LLC
 1950 Bionatics SA
 1909 Computer Graphics World
 713 Curious Labs, Inc.
 2165 Cyra Technologies, Inc.
 1955 Flow Analysis, Inc.
 2321 Holoverse/FantasticLight
 1755 Immersion Corporation
 539 JourneyEd.com
 2424 Measurand Inc
 639 MOTEK Motion Technology, Inc.
 2441 Next Limit SL
 2166 PatternComputing Ltd
 727 Phoenix Technologies Incorporated
 1960 SGDL Systems, Inc.
 2068 SIMI Reality Motion Systems GmbH
 1201 Sun Microsystems, Inc.
 425 TGS, Inc.
 2450 Vivid Group, Inc.

Scientific Visualization

Booth

- 1066 3D Nature, LLC
- 1423 3Dlabs Inc. Ltd.
- 2439 3D-Online
- 411 5DT (Fifth Dimension Technologies)
- 2122 Activeworlds, Inc.
- 1601 Alias|Wavefront
- 1167 ARIUS3D Inc.
- 2037 auto.des.sys, Inc.
- 1950 Bionatics SA
- 1030 Computer Graphics Systems Development Corporation
- 1909 Computer Graphics World
- 713 Curious Labs, Inc.
- 2000 Cycore
- 1247 Discreet
- 523 Dynamic Digital Depth
- 801 Elumens Corporation
- 2008 eyeon Software Inc.
- 2026 Fakespace Systems Inc.
- 1955 Flow Analysis, Inc.
- 2321 Holoverse/FantasticLight
- 1755 Immersion Corporation
- 2159 Immersive Technologies
- 935 IntegrityWare, Inc.
- 2424 Measurand Inc
- 967 Meta Motion
- 2441 Next Limit SL
- 601 NTT Network Innovation Laboratories
- 727 PhoeniX Technologies Incorporated
- 611 pmG Worldwide, LLC
- 2116 Right Hemisphere Ltd.
- 1825 Sense8
- 1960 SGDL Systems, Inc.
- 2068 SIMI Reality Motion Systems GmbH
- 1201 Sun Microsystems, Inc.
- 1921 SynaPix
- 425 TGS, Inc.
- 1647 Trimension Systems
- 2450 Vivid Group, Inc.

Simulation

Booth

- 1423 3Dlabs Inc. Ltd.
- 2439 3D-Online
- 411 5DT (Fifth Dimension Technologies)
- 2122 Activeworlds, Inc.
- 546 Areté Entertainment, Inc.
- 2416 Artabel
- 1035 BARCO Projection Systems America
- 1950 Bionatics SA
- 767 CG2, Inc.

- 1030 Computer Graphics Systems Development Corporation
- 1909 Computer Graphics World
- 2000 Cycore
- 2165 Cyra Technologies, Inc.
- 2057 Electric Image, Inc.
- 801 Elumens Corporation
- 1767 EON Reality, Inc.
- 2008 eyeon Software Inc.
- 2026 Fakespace Systems Inc.
- 1955 Flow Analysis, Inc.
- 2321 Holoverse/FantasticLight
- 2159 Immersive Technologies
- 539 JourneyEd.com
- 1159 Kaydara, Inc.
- 961 Kelseus Ltd.
- 2128 Macromedia, Inc.
- 1766 MENSİ, Inc.
- 967 Meta Motion
- 2441 Next Limit SL
- 1661 NxView Technologies, Inc.
- 753 Opticore
- 1375 Phoenix Tools S.r.l.
- 611 pmG Worldwide, LLC
- 1936 Purdue University Department of Computer Graphics Technology
- 931 Reachin Technologies AB
- 1467 REALVIZ S.A.
- 1825 Sense8
- 1960 SGDL Systems, Inc.
- 1111 Softimage Co.
- 1667 Spatial Integrated Systems, Inc.
- 1201 Sun Microsystems, Inc.
- 2324 Superscape
- 425 TGS, Inc.
- 2453 The Austrian Trade Commission
- 1647 Trimension Systems
- 325 UGS
- 1611 Viewpoint Corporation
- 2450 Vivid Group, Inc.

Storage Devices; Tape/Disk

Booth

- 1909 Computer Graphics World
- 2206 da Vinci Systems, Inc.
- 1004 DISC, Incorporated
- 1135 Hewlett-Packard Company
- 539 JourneyEd.com
- 957 L H Computer Services
- 553 LSI Logic Storage Systems, Inc.
- 629 Média Corporation
- 1060 Microboards Technology LLC

- 1815 Minicomputer Exchange, Inc.
- 2011 Savannah College of Art and Design
- 1201 Sun Microsystems, Inc.
- 1024 Texas Memory Systems, Inc.
- 951 The3DShop.com
- 1237 Waskul Entertainment
- 1046 Workstation Users Alliance, Inc.
- 2447 XS International, Inc.

Streaming Technology

Booth

- 2122 Activeworlds, Inc.
- 1637 Adobe Systems, Inc.
- 701 AMD
- 971 Artbyte Magazine
- 514 Chyron Corporation
- 2000 Cycore
- 1147 DPS/Leitch, Inc.
- 827 Eovia
- 1447 Eyematic Interfaces Inc.
- 2020 interzart AG 3D COMMERCE
- 539 JourneyEd.com
- 2128 Macromedia, Inc.
- 1125 NewTek
- 2335 Point Grey Research Inc.
- 1025 Pulse
- 517 RichFX, Inc.
- 2011 Savannah College of Art and Design
- 1401 SGI
- 1201 Sun Microsystems, Inc.
- 1024 Texas Memory Systems, Inc.
- 951 The3DShop.com
- 1261 Turbo Squid, Inc.
- 2351 UCLA Extension - Computer Graphics
- 1611 Viewpoint Corporation
- 311 Virtue3D
- 1237 Waskul Entertainment

Systems Integrators

Booth

- 411 5DT (Fifth Dimension Technologies)
- 701 AMD
- 1035 BARCO Projection Systems America
- 1030 Computer Graphics Systems Development Corporation
- 2219 Film & Video Equipment Ltd.
- 2321 Holoverse/FantasticLight
- 339 ProMax Systems, Inc.
- 2453 The Austrian Trade Commission

- 951 The3DShop.com
- 1647 Trimension Systems
- 1237 Waskul Entertainment

Terminals, Monitors and Displays

Booth

- 411 5DT (Fifth Dimension Technologies)
- 536 Actuality Systems, Inc.
- 701 AMD
- 1035 BARCO Projection Systems America
- 1909 Computer Graphics World
- 1760 Deep Video Imaging Ltd.
- 801 Elumens Corporation
- 2026 Fakespace Systems Inc.
- 1135 Hewlett-Packard Company
- 957 L H Computer Services
- 1815 Minicomputer Exchange, Inc.
- 2428 Panoram Technologies, Inc.
- 2011 Savannah College of Art and Design
- 1401 SGI
- 1201 Sun Microsystems, Inc.
- 951 The3DShop.com
- 1046 Workstation Users Alliance, Inc.
- 2447 XS International, Inc.

Video Effects Equipment

Booth

- 1947 5D Solutions Limited
- 1946 Accom, Inc.
- 971 Artbyte Magazine
- 2329 B&H Photo-Video-Pro Audio Corp.
- 1059 BOXX Technologies, Inc.
- 1000 CELCO
- 514 Chyron Corporation
- 1909 Computer Graphics World
- 1760 Deep Video Imaging Ltd.
- 2317 Digital Voodoo Australia Pty Ltd
- 1147 DPS/Leitch, Inc.
- 523 Dynamic Digital Depth
- 2321 Holoverse/FantasticLight
- 1567 InterSense, Incorporated
- 1815 Minicomputer Exchange, Inc.
- 1125 NewTek
- 1367 Nothing Real LLC
- 727 PhoeniX Technologies Incorporated
- 2011 Savannah College of Art and Design
- 1111 Softimage Co.

- 2351 UCLA Extension -
Computer Graphics
- 1237 Waskul Entertainment
- 1046 Workstation Users Alliance,
Inc.
- 2447 XS International, Inc.

Video Encoding and Compression

Booth

- 1908 3D Pipeline Corporation
- 1946 Accom, Inc.
- 701 AMD
- 971 Artbyte Magazine
- 617 ATI Technologies Inc.
- 2329 B&H Photo-Video-Pro
Audio Corp.
- 514 Chyron Corporation
- 1101 Compaq Computer
Corporation
- 2317 Digital Voodoo Australia
Pty Ltd
- 1147 DPS/Leitch, Inc.
- 539 JourneyEd.com
- 2411 Khronos Group
- 601 NTT Network Innovation
Laboratories
- 2166 PatternComputing Ltd
- 339 ProMax Systems, Inc.
- 2011 Savannah College of
Art and Design
- 1201 Sun Microsystems, Inc.
- 951 The3DShop.com
- 1237 Waskul Entertainment

Video Servers

Booth

- 1946 Accom, Inc.
- 2329 B&H Photo-Video-Pro
Audio Corp.
- 1059 BOXX Technologies, Inc.
- 514 Chyron Corporation
- 2206 da Vinci Systems, Inc.
- 2317 Digital Voodoo Australia
Pty Ltd
- 629 Média Corporation
- 2011 Savannah College of
Art and Design
- 1401 SGI
- 1201 Sun Microsystems, Inc.
- 1024 Texas Memory Systems, Inc.
- 951 The3DShop.com
- 1046 Workstation Users Alliance,
Inc.
- 2447 XS International, Inc.

Visual Effects Software

Booth

- 1433 2d3 Ltd.
- 1947 5D Solutions Limited
- 2122 Activeworlds, Inc.
- 1036 Addison Wesley-New
Riders Publishing
- 1637 Adobe Systems, Inc.
- 1601 Alias|Wavefront
- 546 Areté Entertainment, Inc.
- 937 Artbeats Digital Film
Library
- 1950 Bionatics SA
- 2438 Boris FX
- 1059 BOXX Technologies, Inc.
- 847 Cambridge Animation
Systems
- 1000 CELCO
- 1909 Computer Graphics World
- 1837 Creation Engine LLC
- 713 Curious Labs, Inc.
- 1050 Darkling Simulations
- 2448 Digital Domain, Inc.
- 524 Digital Vision Ltd.
- 1247 Discreet
- 1147 DPS/Leitch, Inc.
- 523 Dynamic Digital Depth
- 2057 Electric Image, Inc.
- 827 Eovia
- 2008 eyeon Software Inc.
- 552 headus (metamorphosis) Pty
Ltd.
- 1135 Hewlett-Packard Company
- 529 IMAGICA Corp.
- 539 JourneyEd.com
- 1159 Kaydara, Inc.
- 961 Kelseus Ltd.
- 2411 Khronos Group
- 1805 Linker Systems, Inc.
- 1430 Maxon Computer Inc.
- 967 Meta Motion
- 1231 MindAvenue Inc.
- 1125 NewTek
- 2441 Next Limit SL
- 1367 Nothing Real LLC
- 2166 PatternComputing Ltd
- 1375 Phoenix Tools S.r.l.
- 611 pmG Worldwide, LLC
- 339 ProMax Systems, Inc.
- 1467 REALVIZ S.A.
- 2116 Right Hemisphere Ltd.
- 2011 Savannah College of
Art and Design
- 1401 SGI
- 1901 Silicon Grail
- 1111 Softimage Co.
- 1731 Sony Pictures
Imageworks Inc.
- 1967 Steamboat Software, Inc.
- 1201 Sun Microsystems, Inc.

- 1921 SynaPix
- 425 TGS, Inc.
- 1261 Turbo Squid, Inc.
- 2351 UCLA Extension -
Computer Graphics
- 1939 VFX Software
- 1611 Viewpoint Corporation
- 518 Visviva Software, Inc.
- 2450 Vivid Group, Inc.
- 1237 Waskul Entertainment

VR Software

Booth

- 2439 3D-Online
- 411 5DT (Fifth Dimension
Technologies)
- 2122 Activeworlds, Inc.
- 971 Artbyte Magazine
- 1035 BARCO Projection Systems
America
- 1950 Bionatics SA
- 767 CG2, Inc.
- 1030 Computer Graphics
Systems Development
Corporation
- 1933 Cyberware
- 2000 Cycore
- 2165 Cyra Technologies, Inc.
- 1767 EON Reality, Inc.
- 2353 Essential Reality, LLC.
- 331 Eyetronics
- 2026 Fakespace Systems Inc.
- 405 GOMID, Inc.
- 1755 Immersion Corporation
- 2159 Immersive Technologies
- 2020 interzart AG 3D
COMMERCE
- 961 Kelseus Ltd.
- 510 Lake Technology
Corporation
- 967 Meta Motion
- 2136 OES/ITRI
- 2167 OpenSG Forum
- 753 Opticore
- 2166 PatternComputing Ltd
- 931 Reachin Technologies AB
- 1467 REALVIZ S.A.
- 2116 Right Hemisphere Ltd.
- 1825 Sense8
- 1401 SGI
- 1111 Softimage Co.
- 1667 Spatial Integrated Systems,
Inc.
- 1201 Sun Microsystems, Inc.
- 2324 Superscape
- 425 TGS, Inc.
- 1647 Trimension Systems
- 325 UGS
- 2014 Virttools SA

- 2450 Vivid Group, Inc.
- 2029 Web3D Consortium

Web 3D

Booth

- 2331 2ce, Inc.
- 917 3D Metrics, Inc.
- 929 3D World
- 1423 3Dlabs Inc. Ltd.
- 2439 3D-Online
- 459 Academy of Digital
Animation
- 2122 Activeworlds, Inc.
- 1036 Addison Wesley-New
Riders Publishing
- 1601 Alias|Wavefront
- 701 AMD
- 959 American Paper Optics, Inc.
- 1167 ARIUS3D Inc.
- 971 Artbyte Magazine
- 617 ATI Technologies Inc.
- 2438 Boris FX
- 847 Cambridge Animation
Systems
- 535 CCT International
- 2067 Cebas Computer
- 1101 Compaq Computer
Corporation
- 1030 Computer Graphics
Systems Development
Corporation
- 1909 Computer Graphics World
- 1837 Creation Engine LLC
- 713 Curious Labs, Inc.
- 747 Cybelius Software Inc.
- 2000 Cycore
- 1760 Deep Video Imaging Ltd.
- 1361 Digimation, Inc.
- 1247 Discreet
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- 2057 Electric Image, Inc.
- 1560 Electronic Arts
- 1767 EON Reality, Inc.
- 827 Eovia
- 2353 Essential Reality, LLC.
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- 331 Eyetronics
- 2231 GDL Technology
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Ltd
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 1231 MindAvenue Inc.
 1661 NxView Technologies, Inc.
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 753 Opticore
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 1467 REALVIZ S.A.
 517 RichFX, Inc.
 2116 Right Hemisphere Ltd.
 2011 Savannah College of Art and Design
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 1111 Softimage Co.
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 1201 Sun Microsystems, Inc.
 2324 Superscape
 1921 SynaPix
 425 TGS, Inc.
 2453 The Austrian Trade Commission
 951 The3DShop.com
 1261 Turbo Squid, Inc.
 2351 UCLA Extension - Computer Graphics
 325 UGS
 1611 Viewpoint Corporation
 2014 Virttools SA
 311 Virtue3D
 518 Visviva Software, Inc.
 2450 Vivid Group, Inc.
 2029 Web3D Consortium

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Booth

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 1066 3D Nature, LLC
 1423 3Dlabs Inc. Ltd.
 2439 3D-Online
 2122 Activeworlds, Inc.
 1036 Addison Wesley-New Riders Publishing
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 971 Artbyte Magazine
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 733 Big Idea Productions
 2438 Boris FX
 847 Cambridge Animation Systems
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 1101 Compaq Computer Corporation
 1030 Computer Graphics Systems Development Corporation
 1909 Computer Graphics World
 1837 Creation Engine LLC
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 1926 Curious Software Company Ltd.
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 951 The3DShop.com
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 1611 Viewpoint Corporation

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 701 AMD
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 339 ProMax Systems, Inc.
 2011 Savannah College of Art and Design
 1401 SGI
 1201 Sun Microsystems, Inc.
 951 The3DShop.com
 1647 Trimension Systems
 2351 UCLA Extension - Computer Graphics
 1237 Waskul Entertainment
 1046 Workstation Users Alliance, Inc.
 2447 XS International, Inc.

Advertiser Index

Academy of Art College 143
 AJA Video 137
 Biomorph Desk 137
 Charles River Media 139
 CMP/DV.Com 147
 Computer Graphics World 145
 Creative Planet 149
 Cyberware 141
 DV Media Group 151
 Focal Press 155
 Gama Network 157
 IBM Corporation 159
 Macworld 161
 Right Hemisphere 163
 Savannah College of Art and Design 165
 Square USA 167
 Texas Memory Systems 153
 The Hollywood Reporter 169
 XS International Inc. 153
 Variety 171

ACM SIGGRAPH Organization

ACM SIGGRAPH

In the span of 32 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 small 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.

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The SIGGRAPH community depends on your support. Please help by joining ACM SIGGRAPH for \$27 per year (\$20 per year for students). In recognition of their support, members receive the Computer Graphics quarterly, 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.

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Annually at the conference, ACM SIGGRAPH holds a forum to respond to members' concerns, provide information for people who may be interested in volunteering to help the community, answer questions, and report on its year-round projects and accomplishments. All SIGGRAPH 2001 attendees are invited.

Thursday, 16 August, 12:15 - 1:30 pm
South Lobby - ACM SIGGRAPH Membership Booth

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Here's your chance to meet the current group of SIGGRAPH volunteers - from the organization and conference committees - for informative conversations about what they do and how you can help. All SIGGRAPH 2001 attendees, exhibitors, and contributors are invited. All questions and comments are welcome. Tell us what you want to do and we'll help you find the right opportunity.

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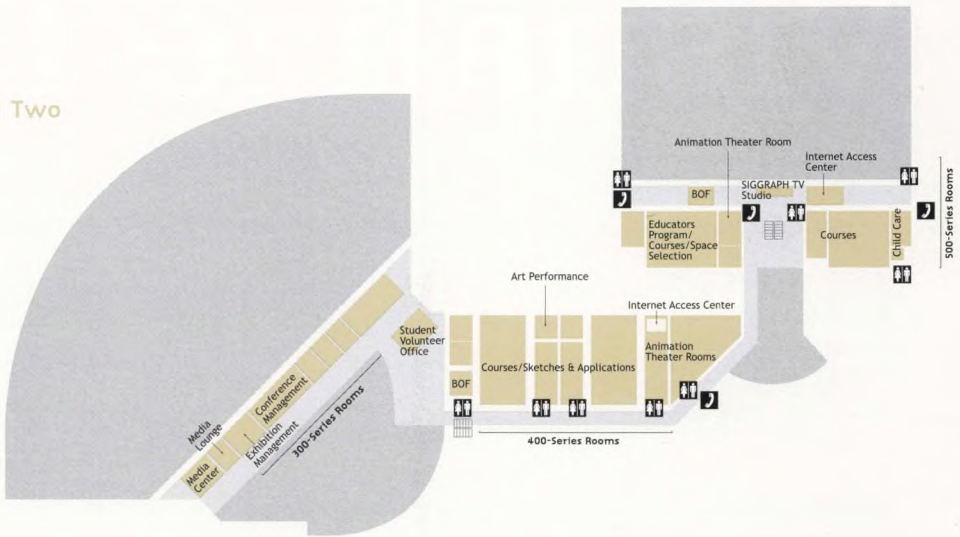
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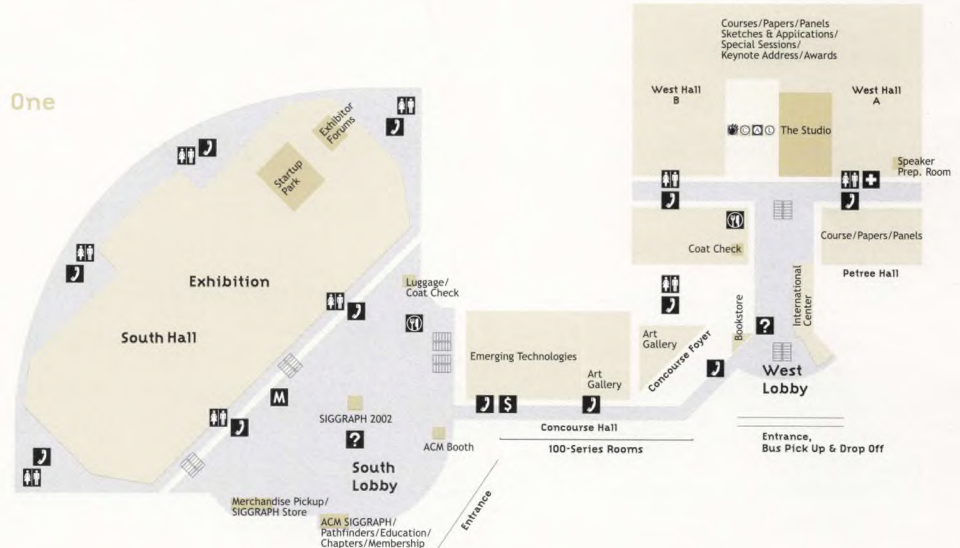
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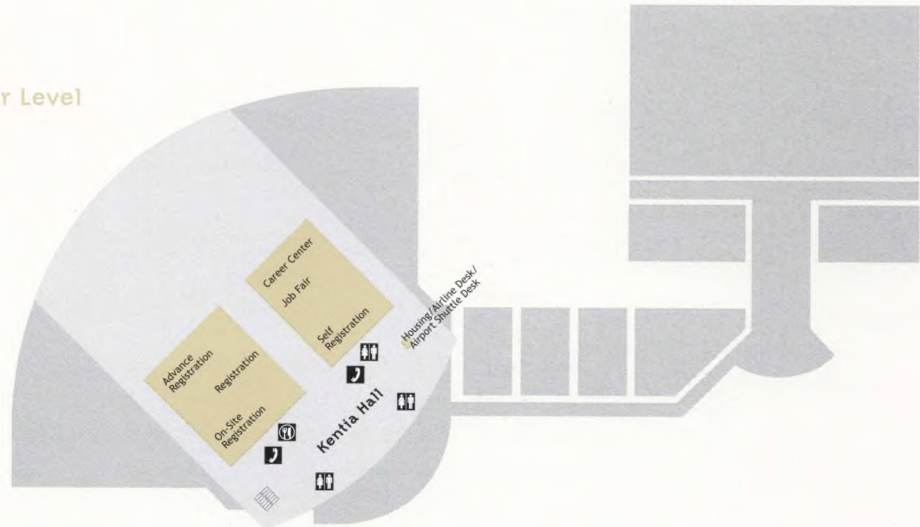
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Cover and Back Cover, Pages 94-101:

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Pages 14-43:

TABULATING MACHINE, HERMAN HOLLERITH, PATENT DOCUMENT, 1889.

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PLANETARY MACHINES, WILLIAM PEARSON, THE CYCLOPAEDEA, 1820.

Pages 58-79:

MULTIPLYING OR DIVIDING MACHINE, OTTO STEIGER, PATENT DOCUMENT, 1895.

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W. S. BURROUGHS CALCULATING MACHINE, PATENT DOCUMENT, 1888.

Pages 86-93:

DIAGRAM OF STEAM ENGINE WITH BALL GOVERNOR, JAMES WATT, 1787.

Pages 102-105:

MECHANICAL REPRESENTATION OF LOGIC, LOGICAL AUTOMATA, ANNIBALE PASTORE, 1890.

Pages 106-115, 128-131:

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