The Art and Interdisciplinary Programs of SIGGRAPH 95

LA
95

COMPUTER GRAPHICS Annual Conference Series | 1995

SIGGRAPH

A Publication of ACM SIGGRAPH

visual proceedings

visual proceedings

The Art and Interdisciplinary Programs of SIGGRAPH 95

EDITED BY

Ken O'Connell

Chair

Art Gallery
Artist/Designer Sketches

Isaac Victor Kerlow

Chair

Interactive Entertainment

Coco Conn, Andy Goodrich, and Rob Hennigar

Co-Chairs

Interactive Communities

Joan Collins and Frank Foster

Co-Chairs

Computer Animation Festival/
Electronic Theatre

SIGGRAPH

COMPUTER GRAPHICS Annual Conference Series | 1995

VISUAL PROCEEDINGS

The Art and Interdisciplinary Programs
of SIGGRAPH 95

COMPUTER GRAPHICS

Annual Conference Series, 1995

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85

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INTERACTIVE COMMUNITIES

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COMPUTER ANIMATION FESTIVAL / ELECTRONIC THEATRE

264

GRAPHICSNET

Ken O'Connell
Chair

Art Gallery

Welcome to the SIGGRAPH 95 Art Gallery

This year, the Art Gallery presents work in a wide variety of art forms. Artists throughout the world are working with computers to produce both objects and environments for us to experience. At SIGGRAPH 95, artists from 13 countries display a broad range of work, from framed wall pieces to installations and interactive environments. New features this year include both traditional artist's books and electronic artist's books, which allow computer-mediated interaction with the content and the presentation. The SIGGRAPH 95 Art Gallery also features the new field of digital illustration and postal art from all over the world, mounted together in frames to show the range of images that are now being created and passed through the mail.

The presence of SIGGRAPH 95 and the SIGGRAPH Art Gallery in Los Angeles has created the opportunity for many galleries in the Los Angeles area to host special exhibitions of electronic art. A list of these gallery events is included in the SIGGRAPH 95 Program and Buyer's Guide.

ART GALLERY JURY

Craig Hickman
Creator of KID PIX and past contributor to SIGGRAPH art shows. Hickman's software has received over 19 international awards. He has produced two artist's books and exhibited his work widely.

Karen Guzak
Painter, printmaker, and computer artist, included in Frank Popper's book *Art of the Electronic Age*. A past contributor to SIGGRAPH art shows, Guzak has coordinated a number of large-scale art projects including "Chaos to Order," an indoor/outdoor mural, at the Computer Services Building at Southern Oregon State College.

Glenn Mitsui
Digital illustrator at Studio M/D, who recently illustrated an Atlantic Monthly cover. He has also done illustrations for NEC, Microsoft, Apple Computer, Letraset, and Newsweek, and his work has appeared in PRINT magazine.

Midori Kitagawa De Leon
Of the Advanced Center for Computers in Art and Design (ACCAD) at the Ohio State University and SIGGRAPH 95 International Chair. She is a past contributor to SIGGRAPH art shows.

Barbara Mones-Hattal
Sculptor and creator of the virtual reality lab at George Mason University. She is working on the NASA/Goddard visualization team for the GLOBE project sponsored by the White House. She has also organized two exhibits on art and technology at the Smithsonian Institution in Washington, D.C.

CONTACT

Ken O'Connell
SIGGRAPH 95
Art Gallery Chair

Fine Arts Department
5232 University of Oregon
Eugene, Oregon 97403-5232
USA

+1.503.346.0427
+1.503.346.3626 fax
oconnell@aaa.uoregon.edu

Charles Boone
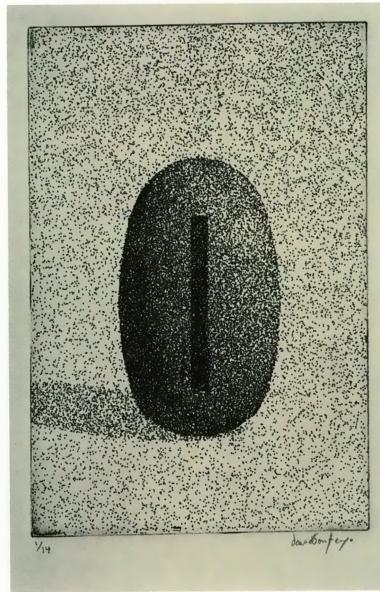
Chapter 5

Dye sublimation print
8.5 x 6 inches

David Bontempo

rock 01

Etching on paper
6 x 4 inches

David Bontempo

rock 02

Etching on paper
6 x 4 inches

David Bleich
Divine 1

Chromogenic print
8.5 x 11 inches
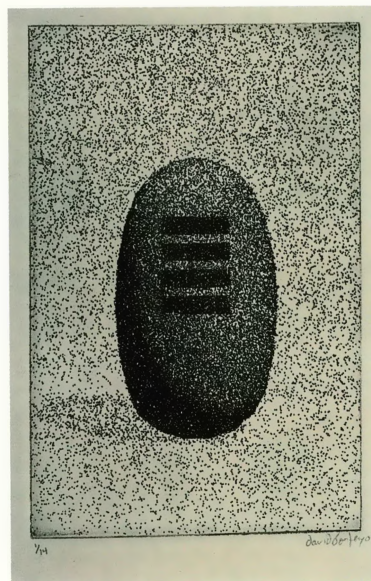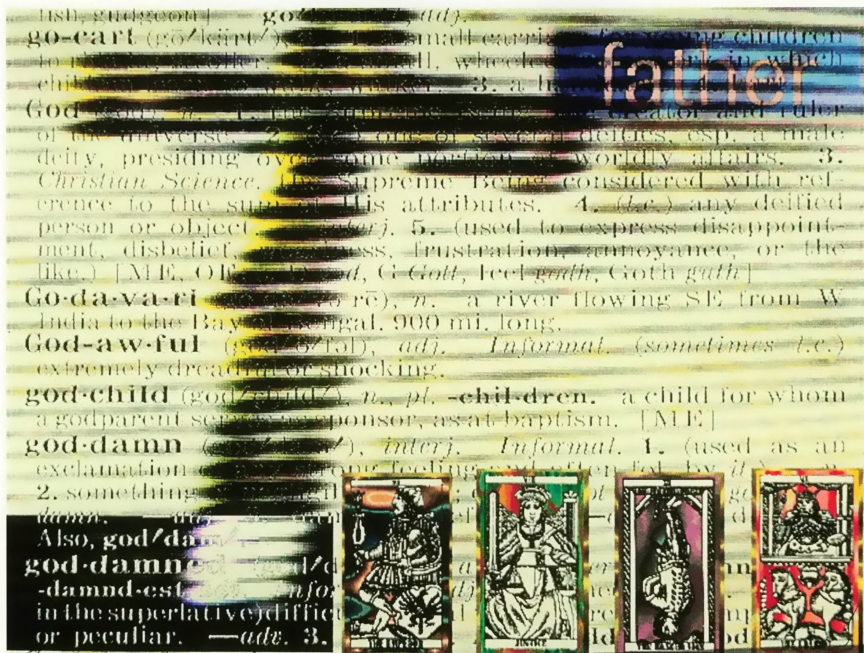
Jeff Brice

Gravity

Iris print
24 x 20 inches
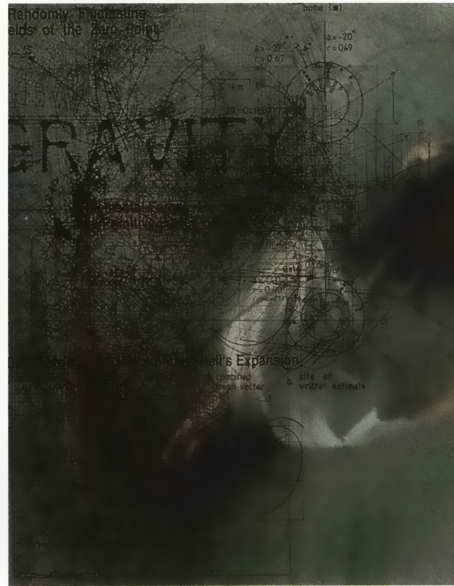
Jeff Brice

Quantum Qupids

Iris print
24 x 20 inches
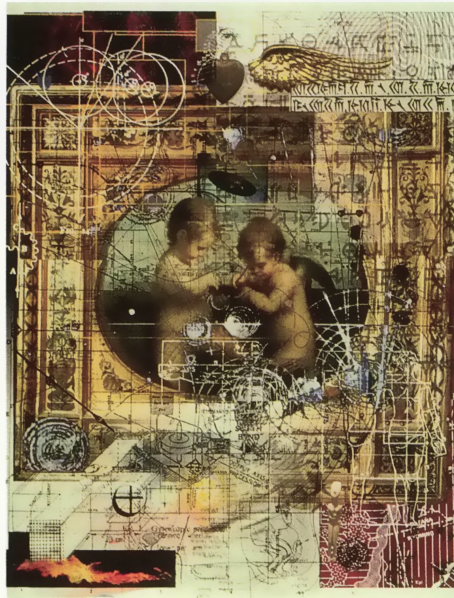
Celeste Brignac

Kaos

Computer-manipulated
photography
24 x 20 inches
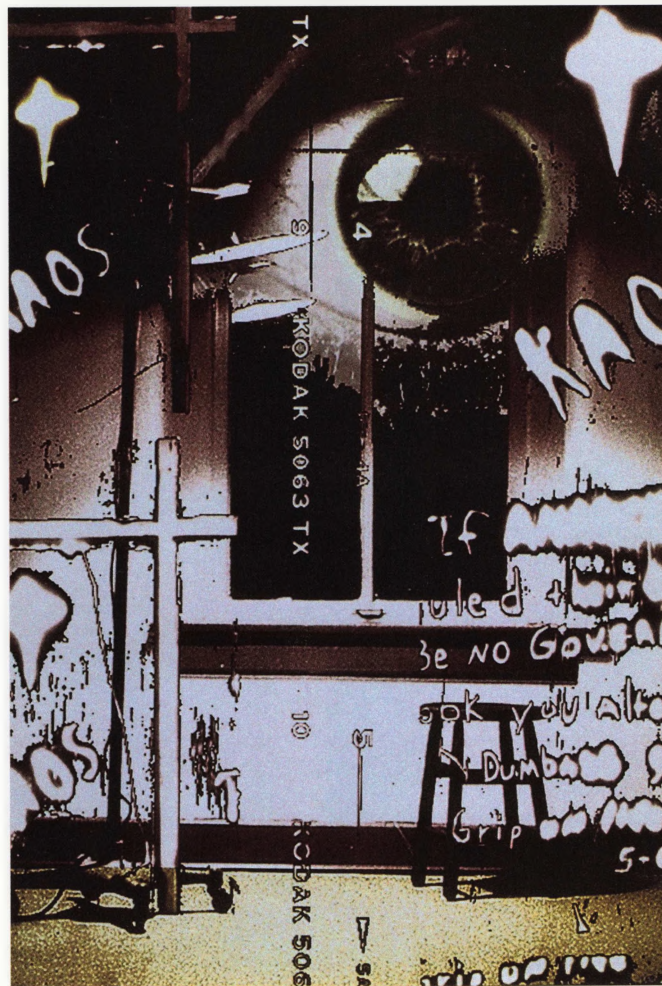
Denis A. Dale
*"Having said, the grass is
always greener ... in this
case it was."*
Flood series

Iris ink-jet print
24 x 35 inches

Jennifer DeBlock
Disguise

Electronic painting
(mat and frame painted)
11 x 13 inches

Jennifer DeBlock
Only A Part

Electronic painting
(mixed media: mat and frame)
12.5 x 15.5 inches

Joseph P. DeLappe

*The Continuum: Husband &
Wife Starting To Look Like
Each Other*

Digital photo/Iris ink-jet print
18 x 24 inches
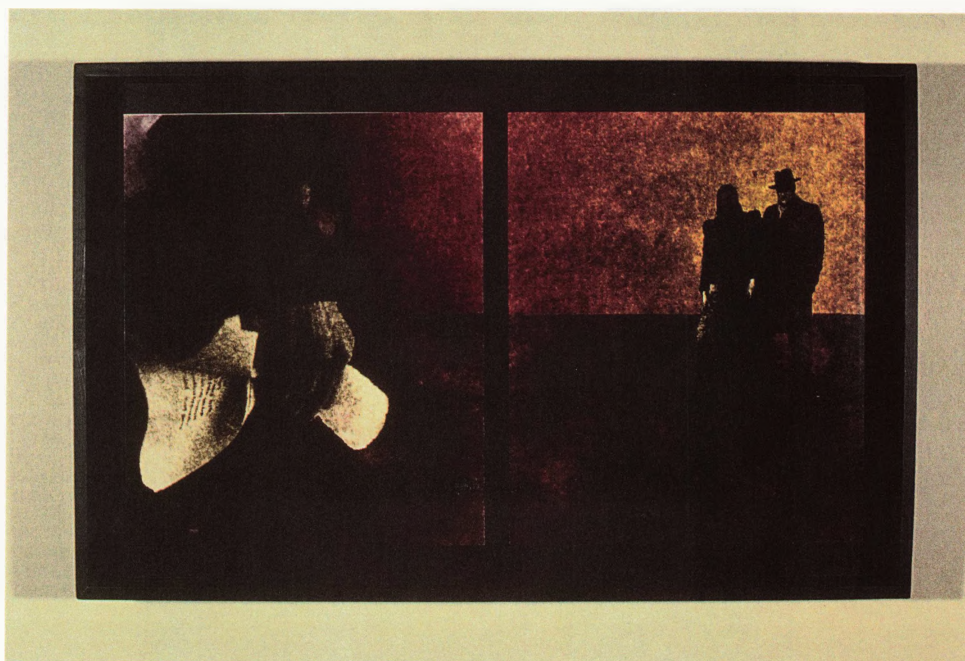
Anne Farrell
Trump

Iris print
19 x 13 inches

Diane Fenster

Canto One/The Aurora Borealis

Iris ink jet
30 x 40 inches

Diane Fenster

Canto Three/Circumstantial Evidence

Iris ink jet
40 x 30 inches
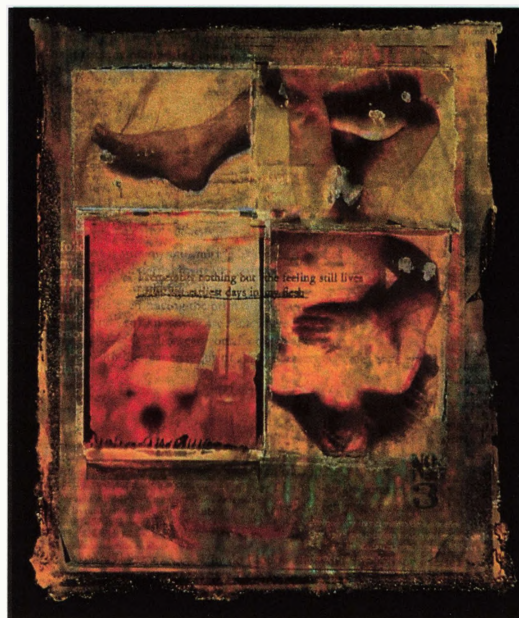
Kurt Fleischer

Spike

Computer image on 35mm film
Cibachrome
10 x 10 inches

Collaborators

David Laidlaw
Bena Currin
Cindy Ball
Eric Winfree
Mark Montague
Alan Barr
and the Caltech Graphics Group
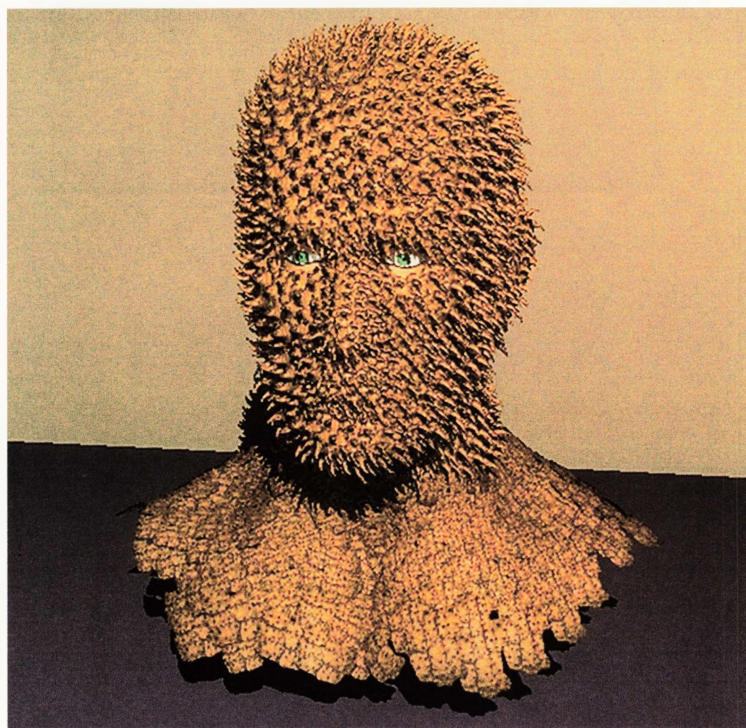
Madge Gleeson
None of Your Business

Thermal print
24 x 35 inches
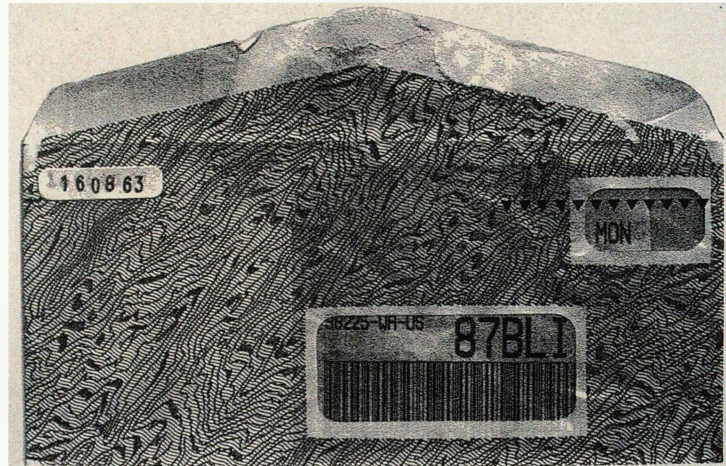
Madge Gleeson
Thin Slice of Life

Thermal print
22 x 30 inches
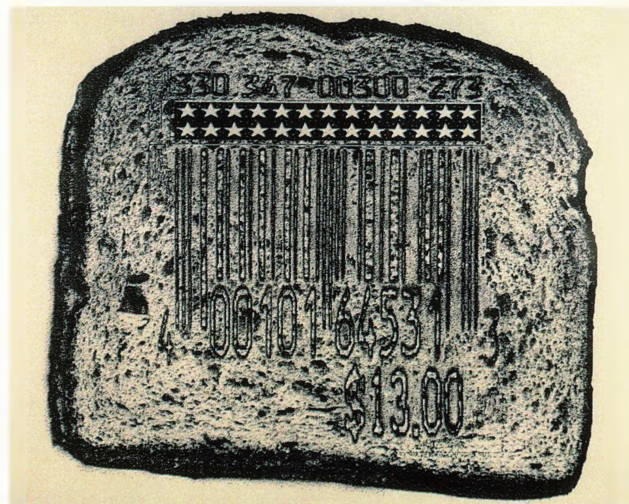
Lane Hall

Woodland Goiter Series:
Mosshead

Woodcut, computer, and Japanese
paper – triptych
60 x 40 inches

Collaborator

Lisa Moline

Lane Hall

Woodland Goiter Series:
Spirochete

Woodcut, computer, and Japanese
paper – triptych
60 x 40 inches

Collaborator
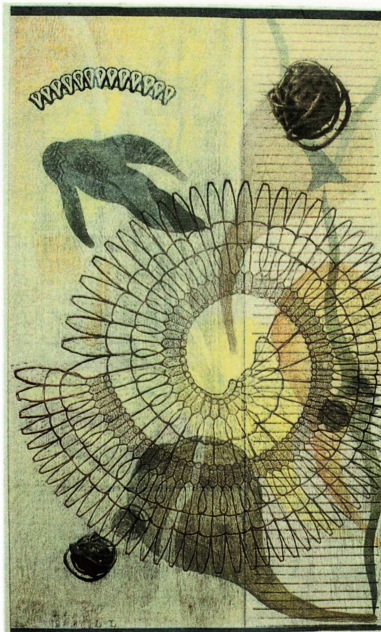
Lisa Moline

Lane Hall

Woodland Goiter Series:
Waterbug

Woodcut, computer, and Japanese
paper – triptych
60 x 40 inches

Collaborator
Lisa Moline
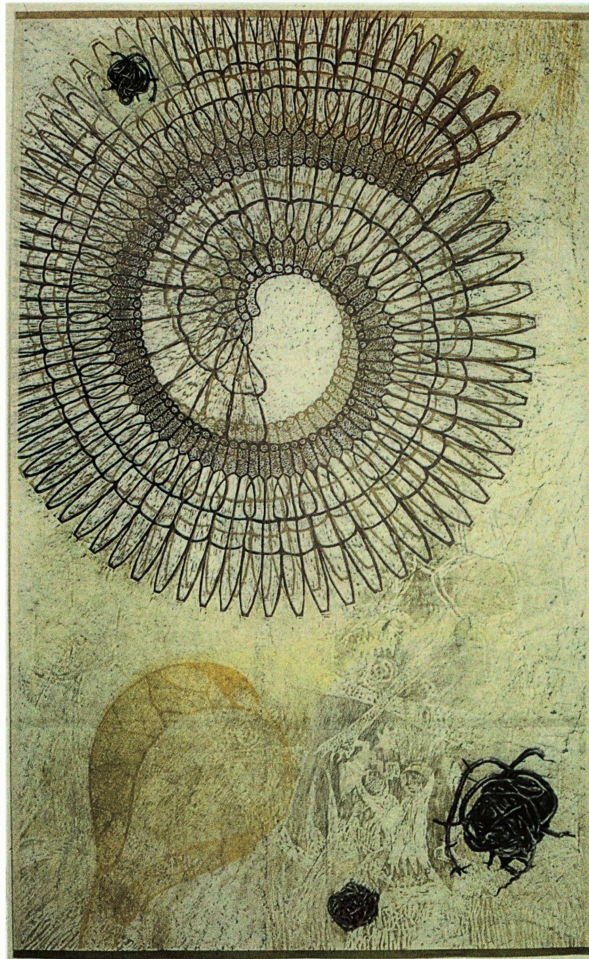
Jean-Pierre Hebert

Un cercle trop étroit

Ink on paper
35 x 25 inches
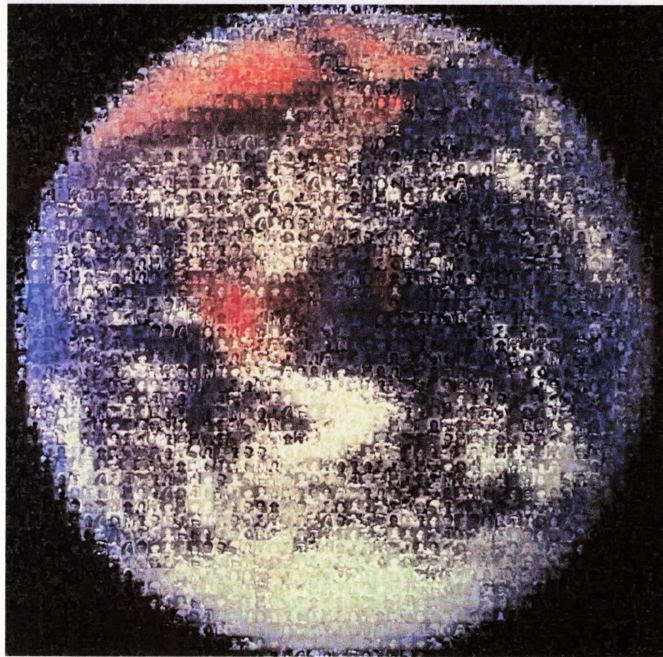
Michael Höpfel

Primo Tempore

One of 10 digital color enlargements,
matt foil, screen print
62 x 148 cm
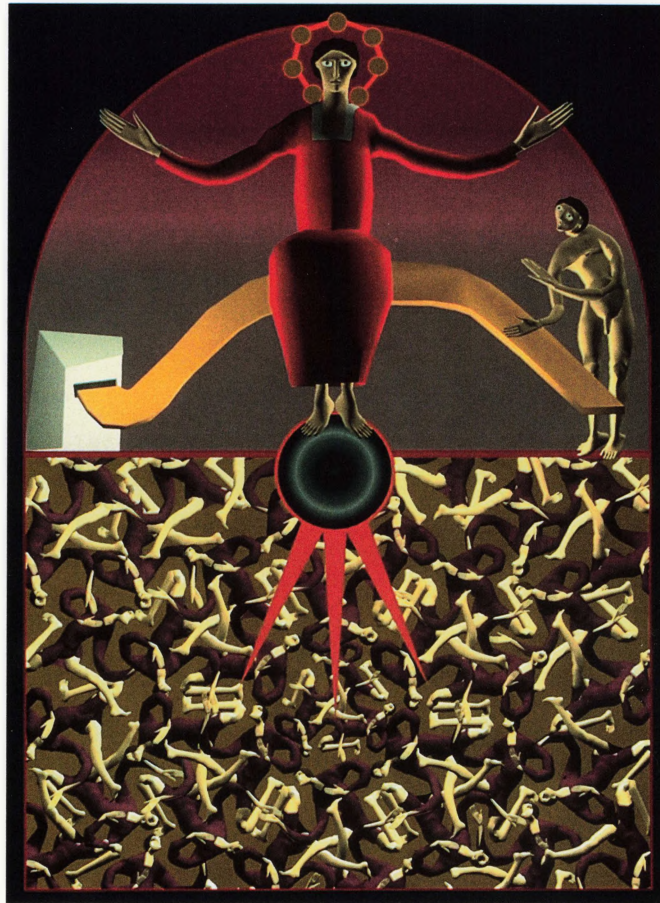
Masa Inakage
Relation

Photo enlargement
60 x 80 cm

Chris S. Johnson

eyesore

Iris print
12 x 16 inches
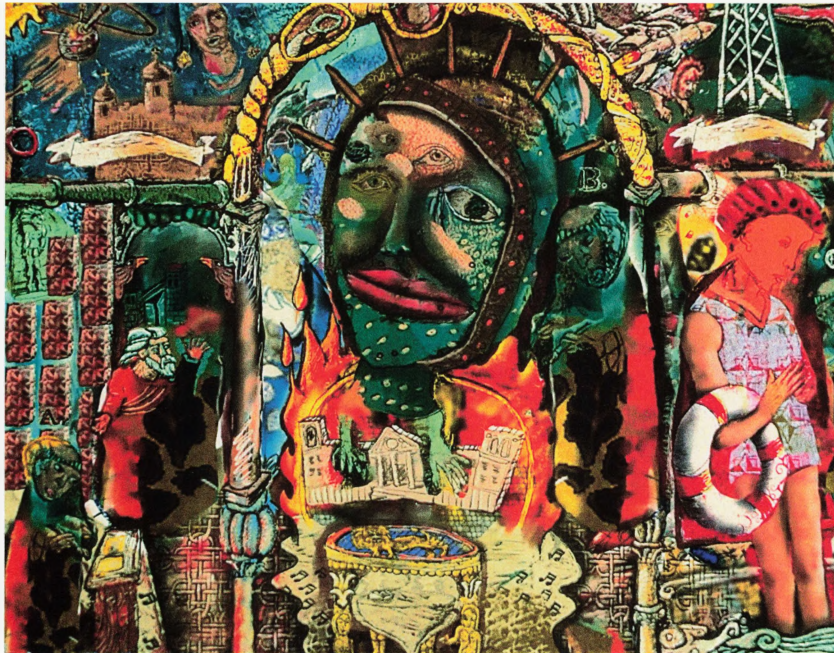
Aviv Kruglanski
Mixed media assemblage with
photo transparency
8 x 3.5 x 8 inches
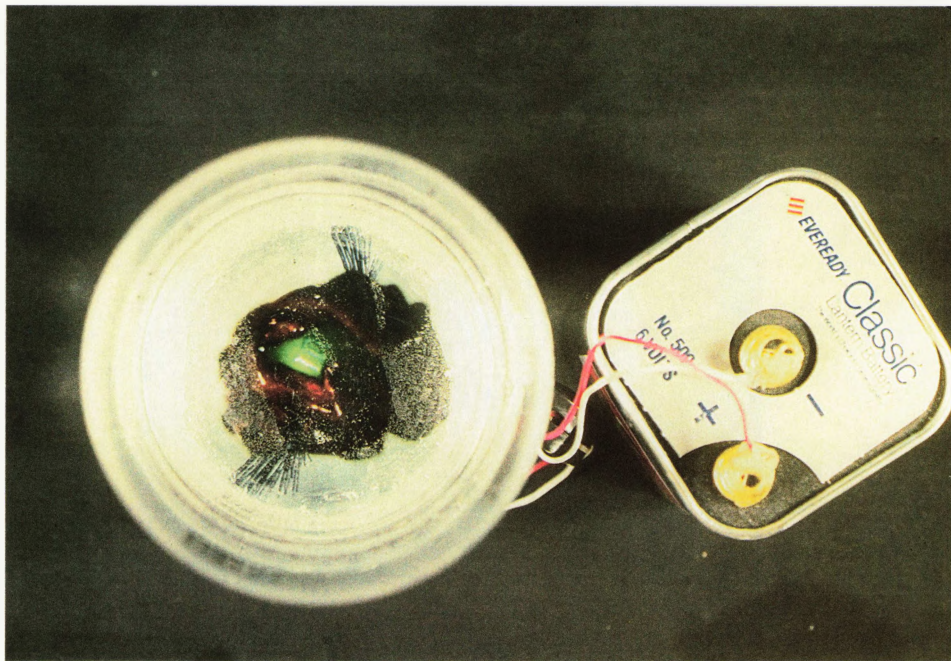
Ka-Sing Lee

City at the end of Time

Digital imaging
24 x 20 inches
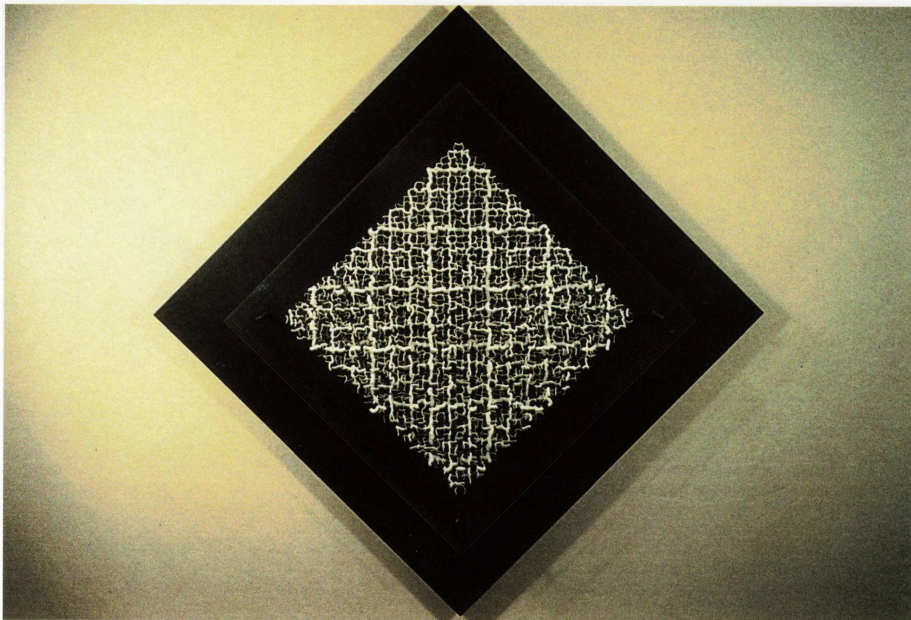
Ante Magzan
Crveno Br. 1973

Iris print
18 x 24 inches
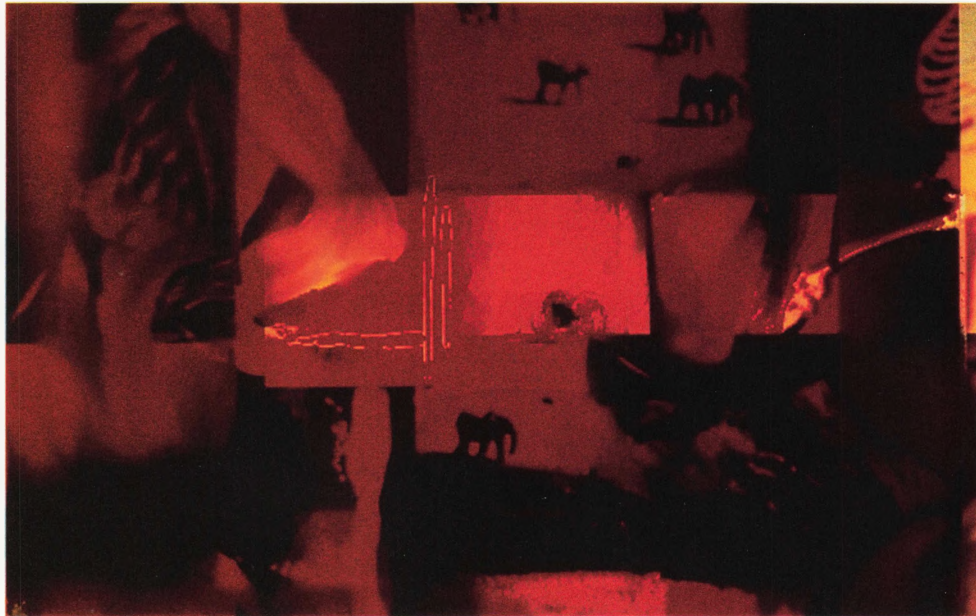
Kent Manske
Answers

Iris print, acrylic, and wood
13 x 17 x 1 inches

Collaborator
Nanette Wylde

Kent Manske
Pedestals

Iris print, acrylic, and wood,
13.5 x 18 x 3 inches

Collaborator
Nanette Wylde
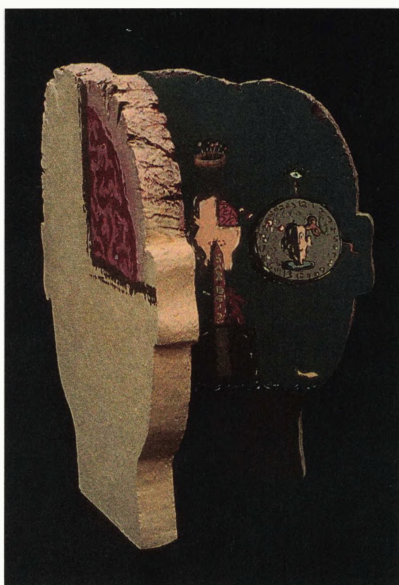
Guy Marsden

Digital Numeric Relevator Mk
VII—Round Numbers

Electronic parts and acrylic
15 x 12 inches diameter

Terry Monnett
Particulate Downbeat

Cibachrome print
15 x 24 inches
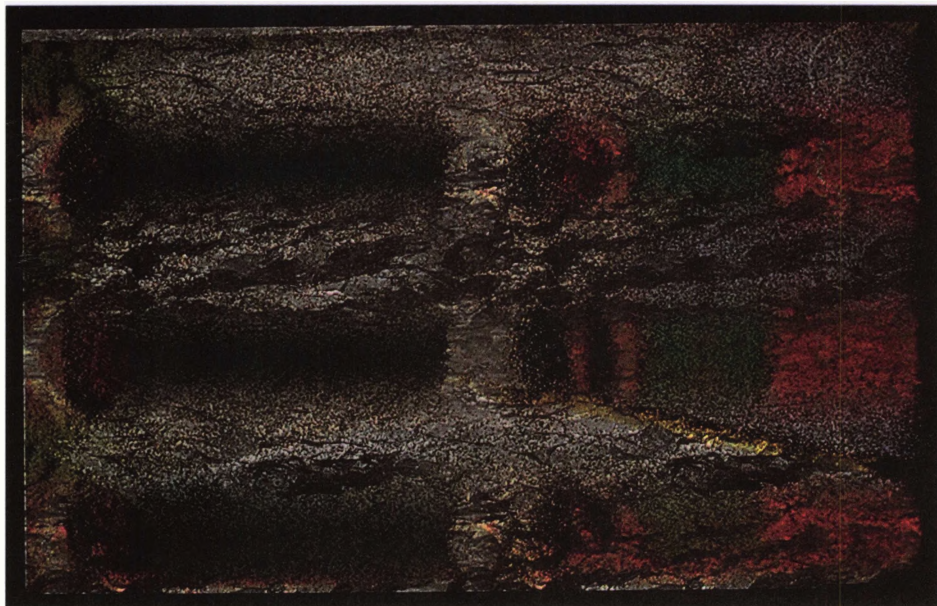
Carlos Eduardo Muti Randolph
Vosco, Dumbo and Duvel

Computer print triptych
("Vosco" shown)
17 x 11 inches (each)
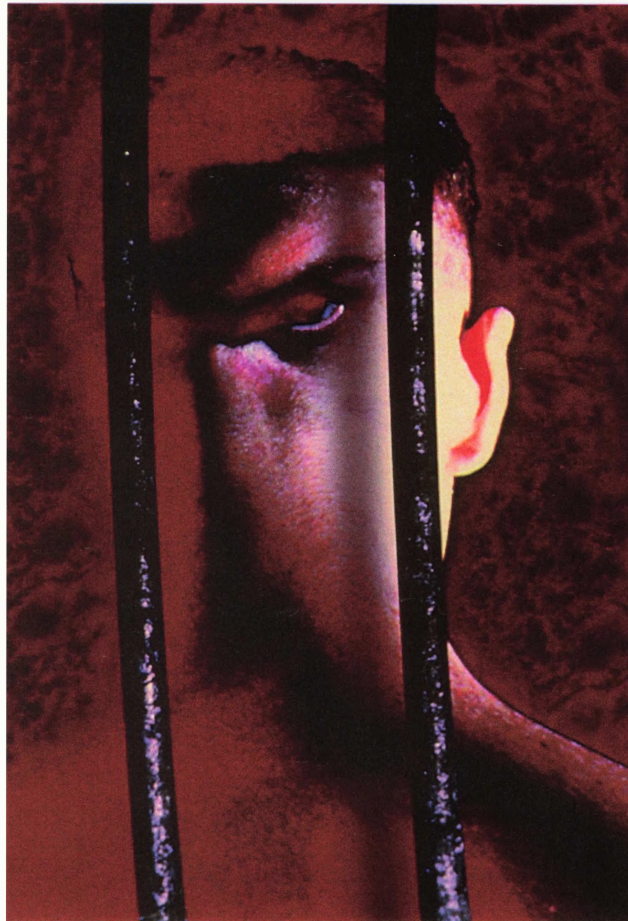
Barbara Nessim

Common Sense in Short Supply

Computer drawing/acrylic on
paper-covered Gatorfoam
44 x 34 inches
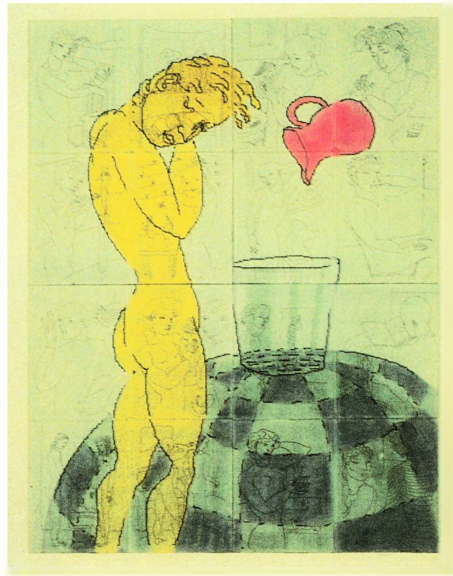
Barbara Nessim

Seeking Monumental Status

Computer drawing/acrylic on
paper-covered Gatorfoam
44 x 34 inches

Leslie Nobler-Farber
Golden Girls' Security

(Computer) mixed & quilt
37 x 43 inches
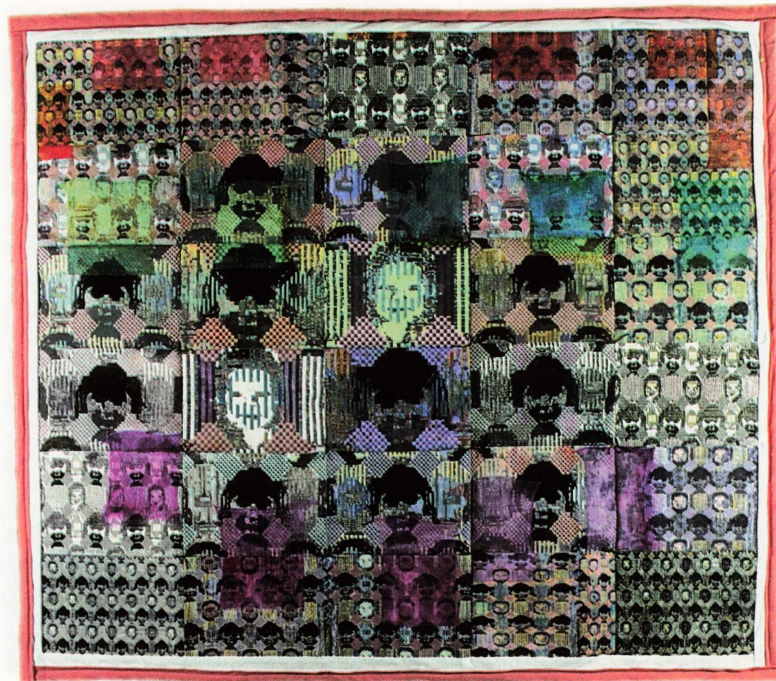
Niki Nolin

Candy Box – In Progress

Mixed media – sound
12 x 7 x 3 inches
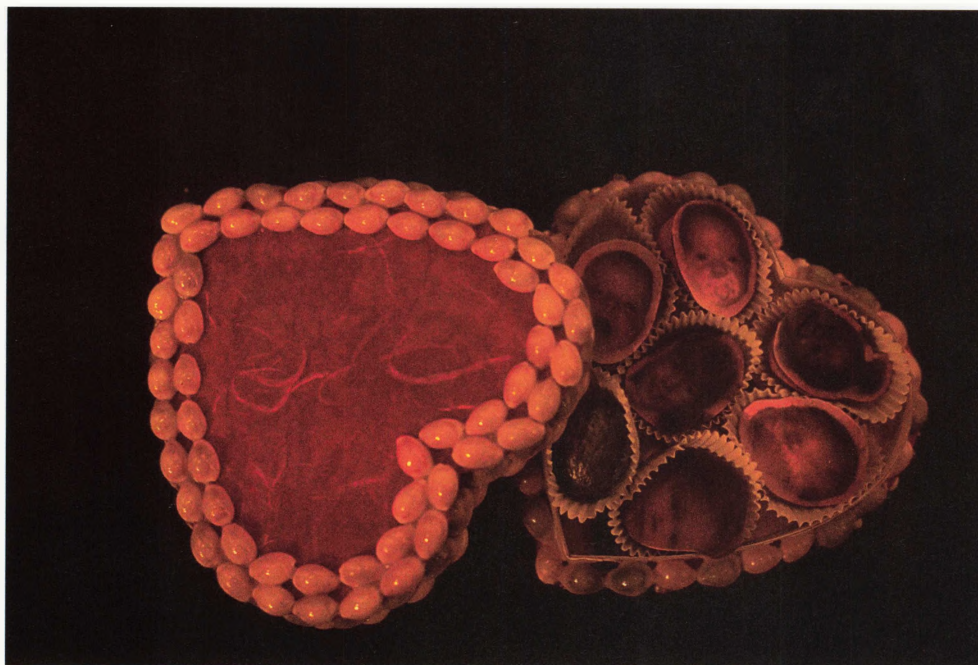
Peter Patchen
Listening to the past

Computer, wood, plaster, acrylic,
laser printer
Triptych
6 x 6 x 1.5 inches (each)

Peter Patchen
Unbounded Ingress

Computer, wood, plaster, acrylic,
laser printer
9.75 x 11.25 x 1.75 inches

Lynn Pocock

Linger: Things Left Behind

Monotype, ink on paper
17 x 23 inches
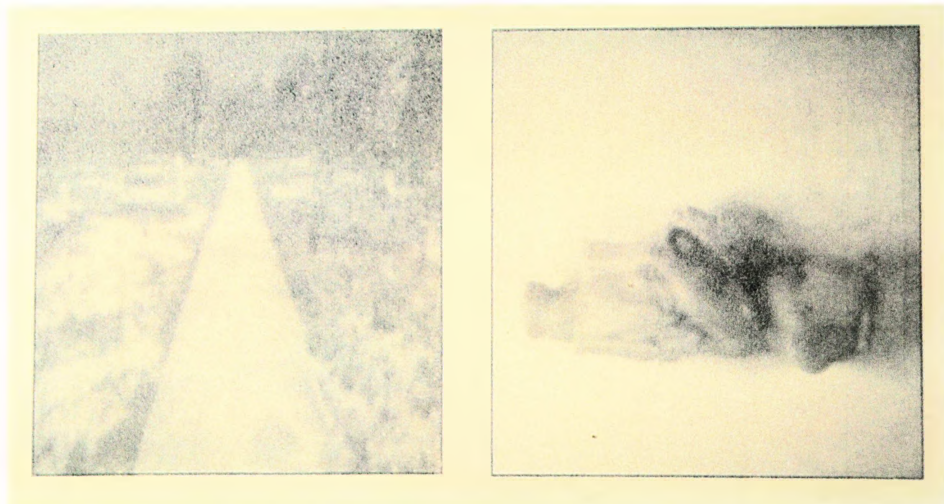
Cynthia Beth Rubin

November Memories

Iris print
30 x 24.5 inches

Karin Schminke

Dream Cycle IV

Iris print
31.5 x 24 inches
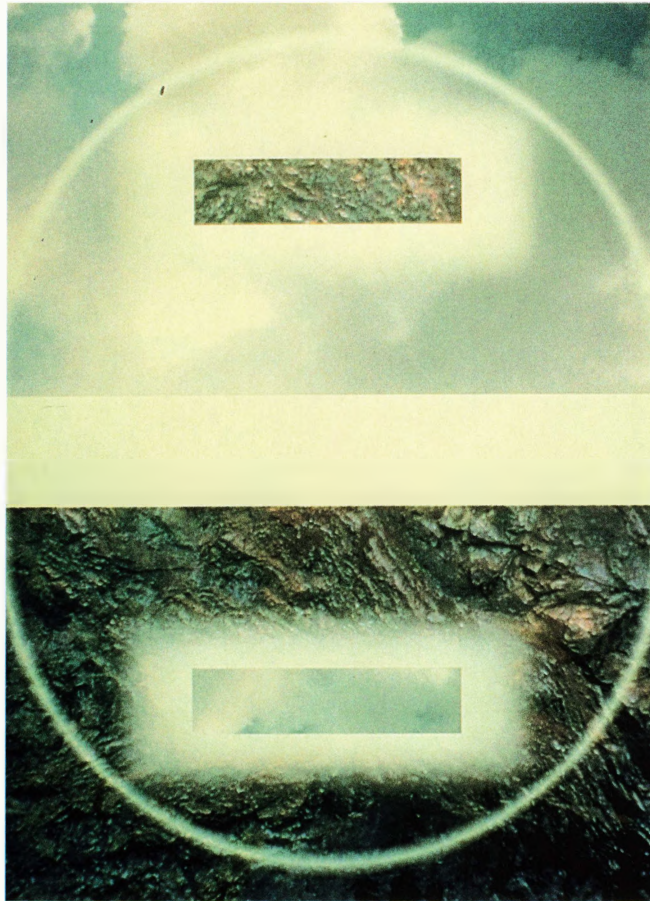
Head III

Iris print
5 x 5 inches
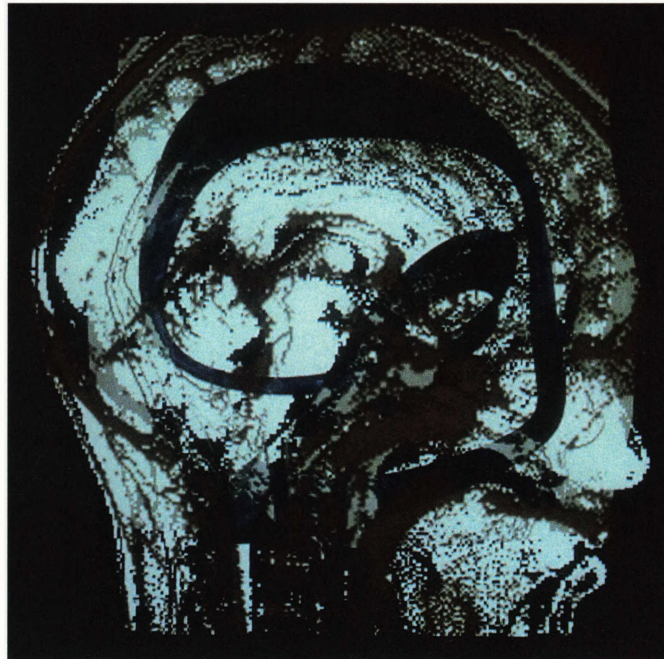
Dennis Staffne
Circle of Grass II

Iris print
16 x 16 inches
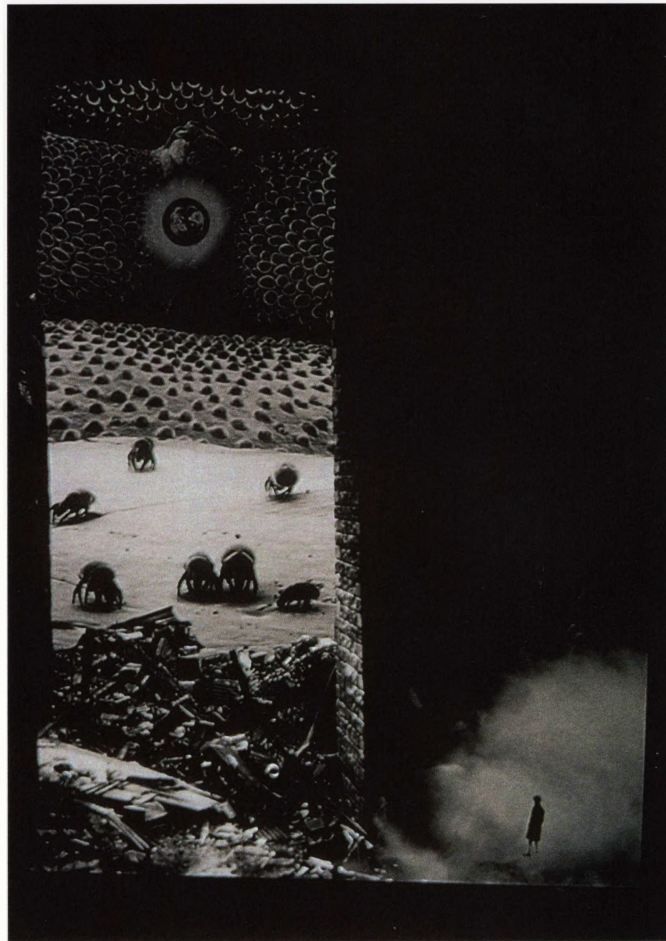
Jerry D. Threet
What is love?

11 x 7.5 inches

Nicolai Tsibin
Wind fair wind

Ink jet print
12.5 x 17 cm

Anna Ursyn
Monday Morning

Versatec plots, VAX, FORTRAN 77,
photosilkscreens and photolithograph
36.5 x 48 inches

Anna Ursyn
Two Moons

Versatec plots, VAX, FORTRAN 77,
photosilkscreens and camcorder
42.5 x 60 x 2 inches
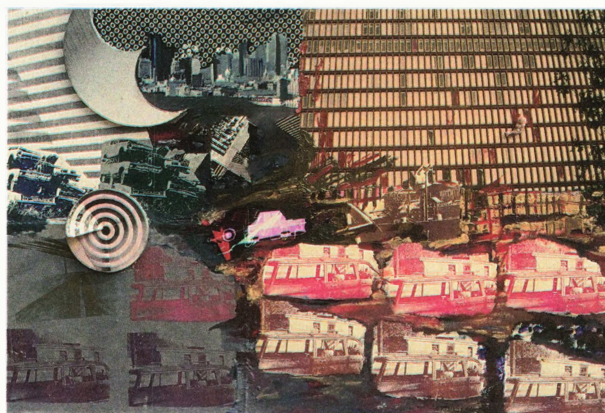
Roman Verostko
Illuminated Universal Turing Machine

Plotter drawing on rag paper
40 x 30 inches
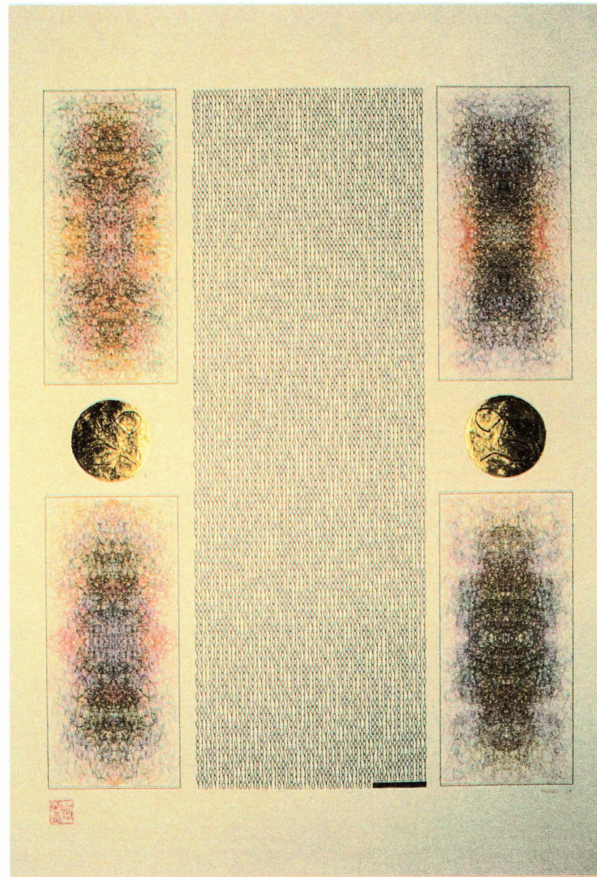
James Faure Walker

A Pony in Clerkenwell

Ink-jet prints on card
27 x 37 inches
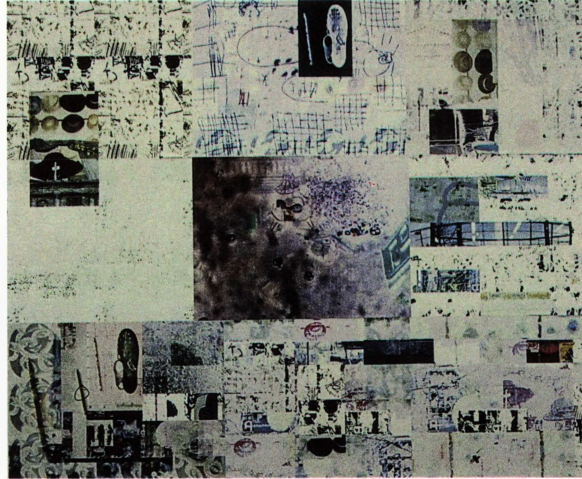
James Faure Walker

Die Formes: Flight

Ink-jet prints on card
30 x 40 inches
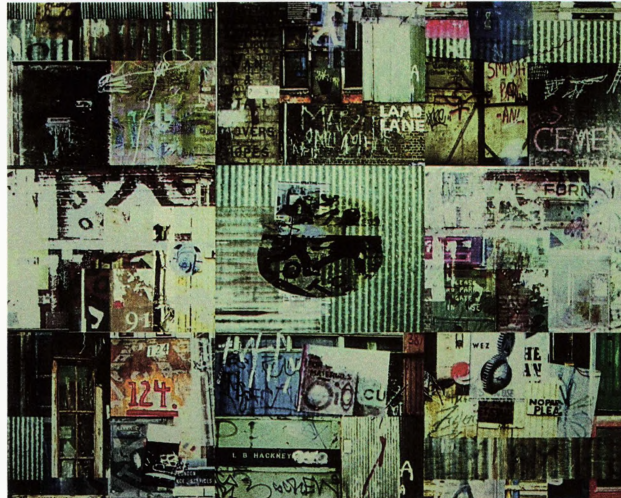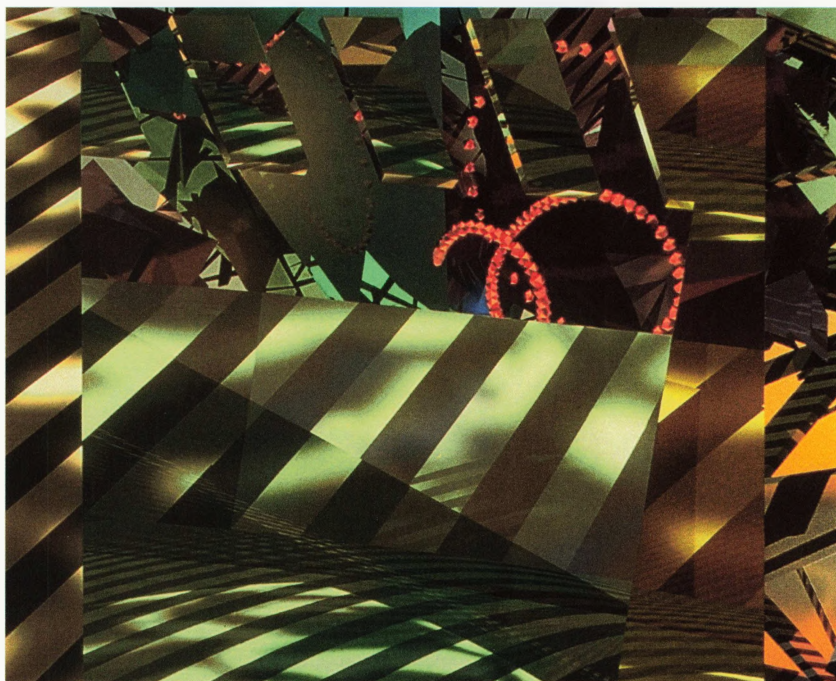
Jason David Ditmars

Mind and Body Environment

Acrylic, steel, electronics, neon,
and media devices
5 x 5 x 5 feet
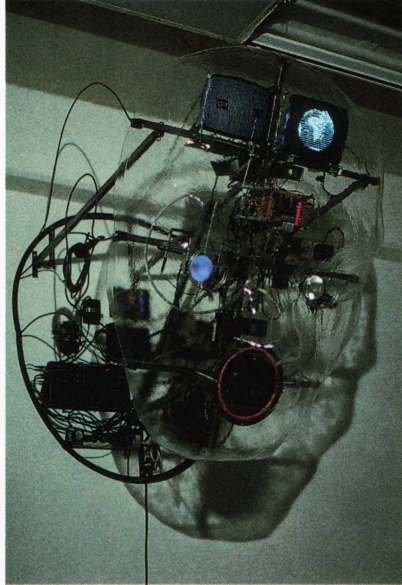
Franz Fischnaller

Lautriv Chromagnon/Medusa

Virtual reality/3D
210 x 100 x 120 cm

Collaborator
Yesi Maharaj Singh
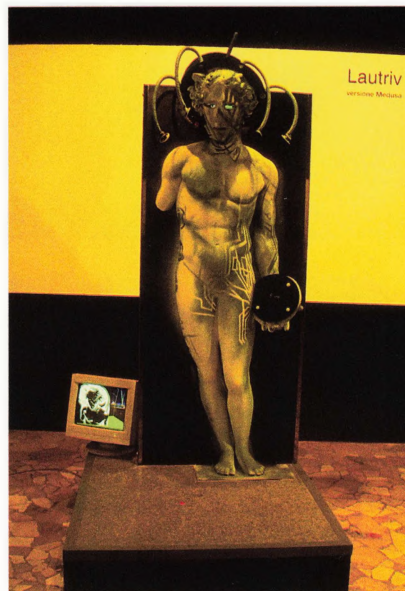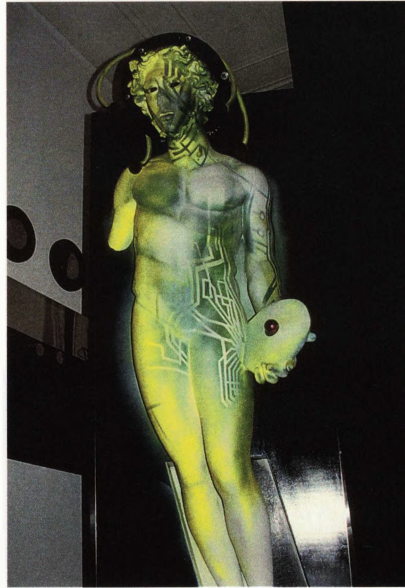
Phillip George
Mnemonic Notations

Installation
3 x 5 meters

Collaborator
Ralph Wayment

Robin Kilgore
On Reflection

CD-ROM
Interactive computer display
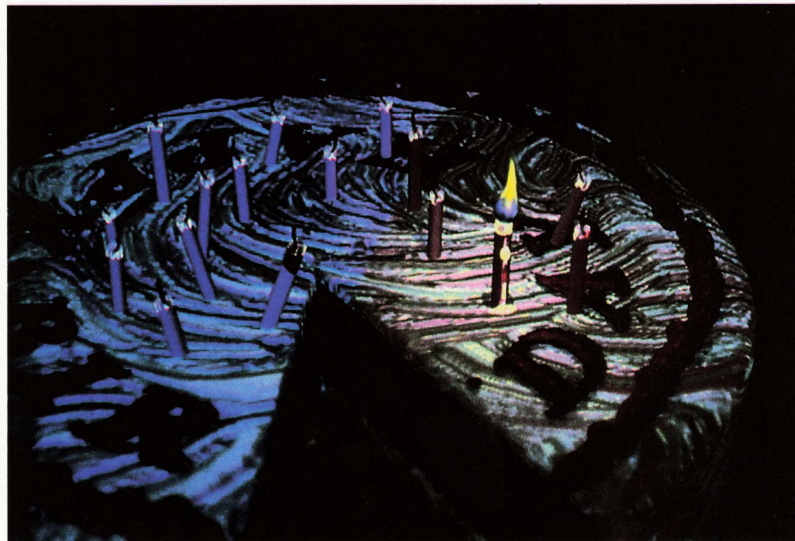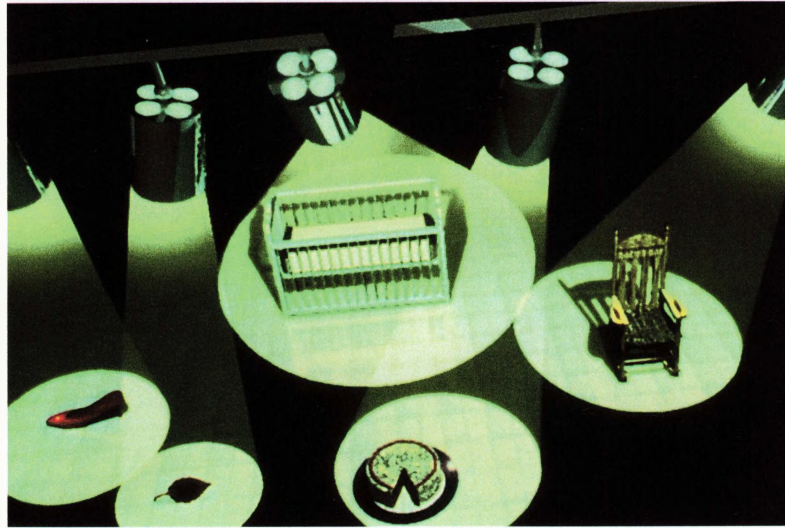
Jean Paul Longavesne
Live Painting Creation
(by the use of networks)

Installation of a large painting
robot
5 x 6 x 7 m

Collaborators
Quarks
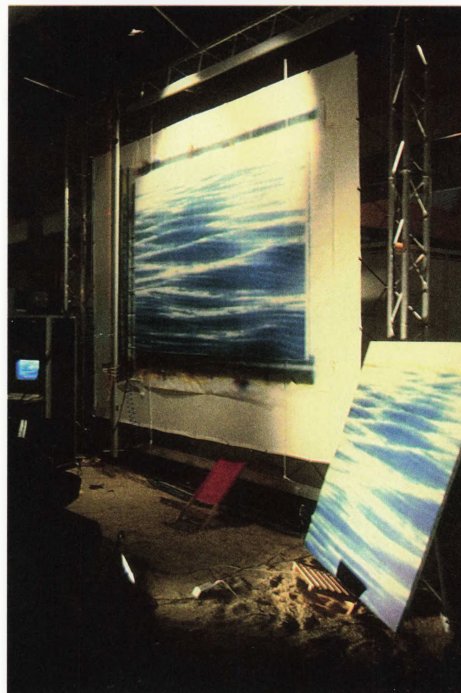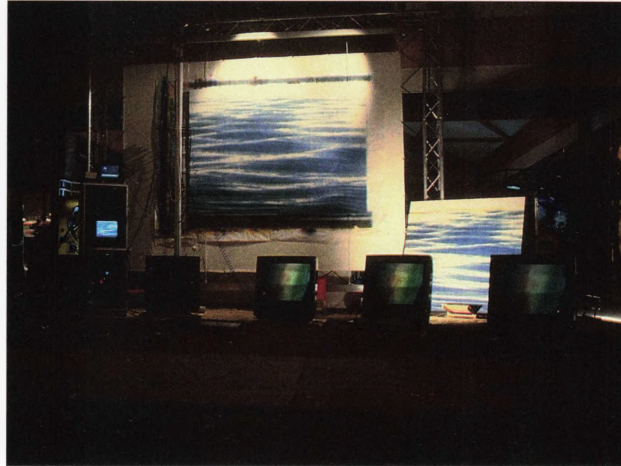
Susan E. Metros

*good daughter, bad mother,
good mother, bad daughter:
catharsis + continuum*

Interactive computer display
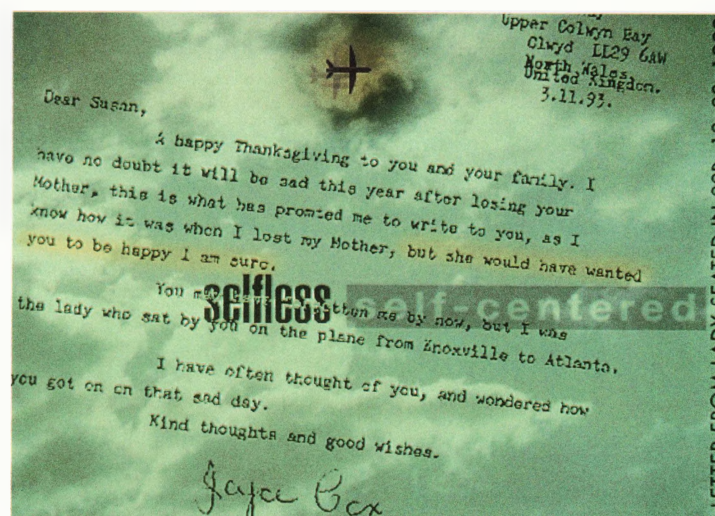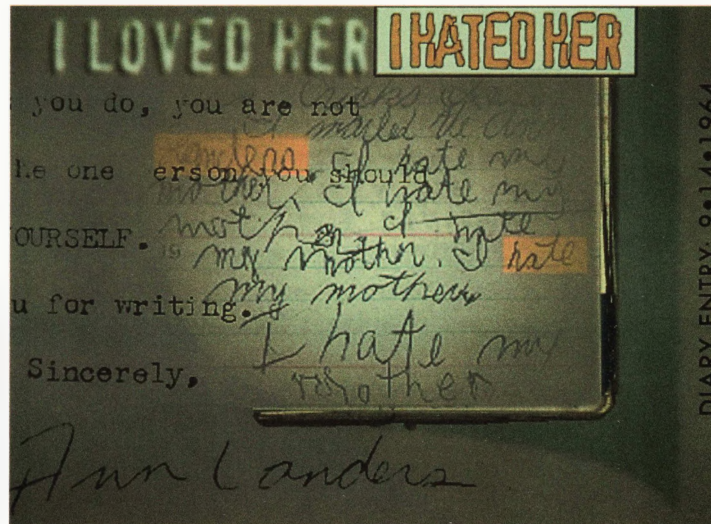
Niki Nolan

Greetings from Chicago

Five multimedia and five sound modules
10 x 12 x 2 inches (each)
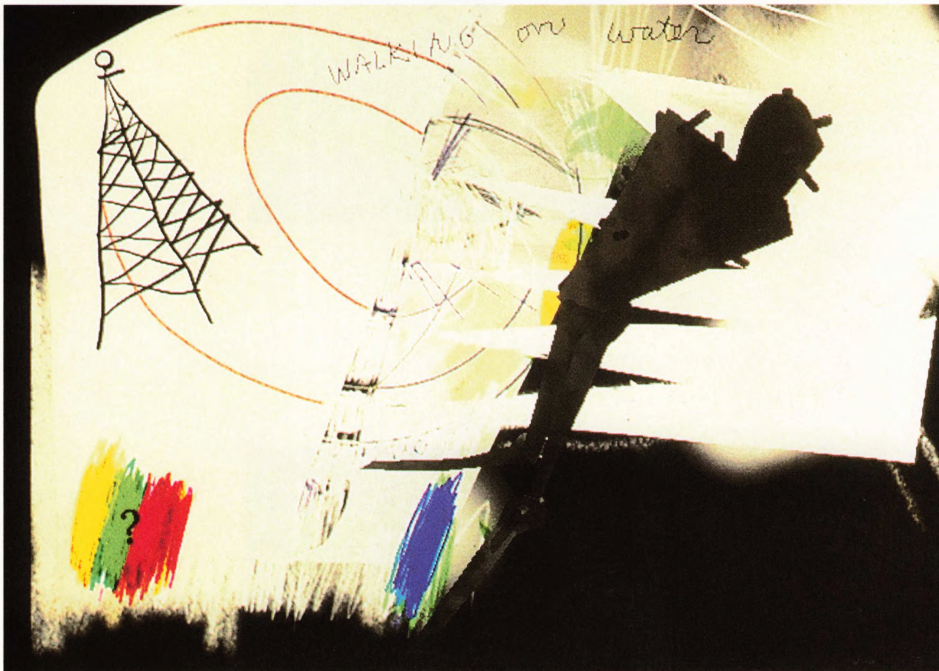
Leslie Wilson
Ladies Dance

Installation
Computer graphics, textiles,
and LEDs
10 x 18 x 15 feet

Detail

Detail

Detail

Don Arday
Fire and Ice Chip

Dye sublimation print
6 x 6 inches

Don Arday
Stop Smoking

Canon CLC
8 x 5 inches

Harvey Goldman
Blue eyes in the Land of
Forgotten Moisture

Iris print
11.5 x 7.5 inches

Yun-Kyung Huh
Self-portrait 3

Iris print
18 x 12 inches

Susan Le Van

Another man/Another dog

Iris print
11 x 11 inches

Karen White
Link

Iris print
6 x 24 inches
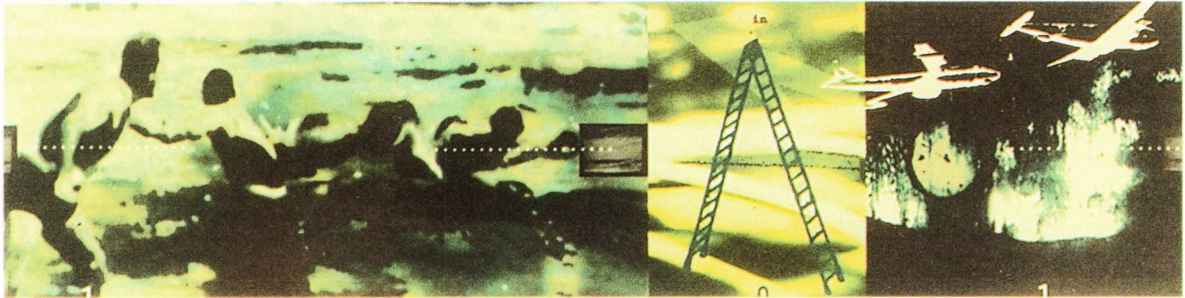
Nathan S. Williams
Cybatic

Electronic painting
6.375 x 9.625 inches

Cristina Almeida

Study of a spoken dialogue
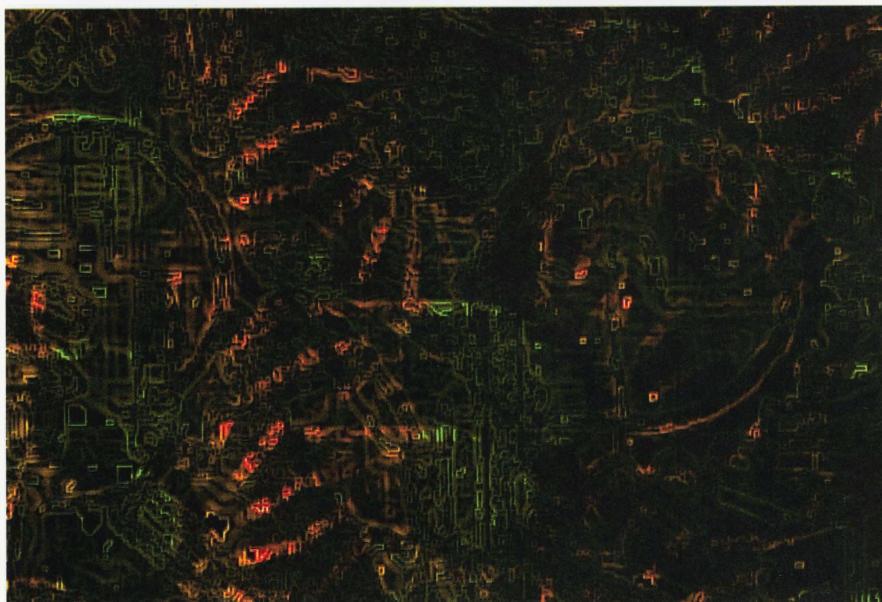
Linotronic output and silk screen
on mylar
21 x 18 inches
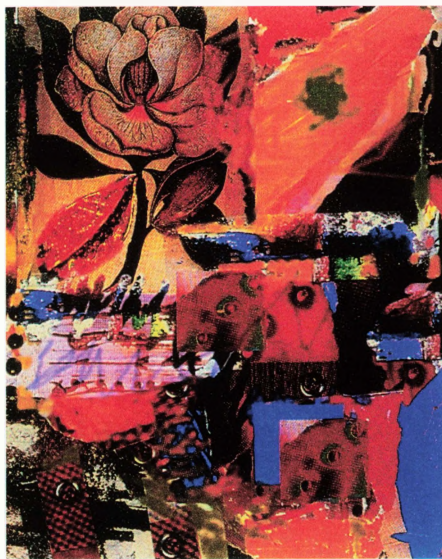
Kami Griffiths

Jumping the Waves

Artist book
6 x 4 inches
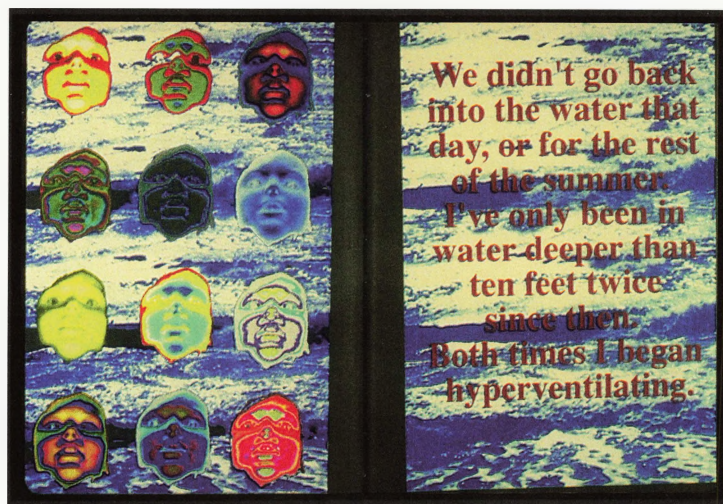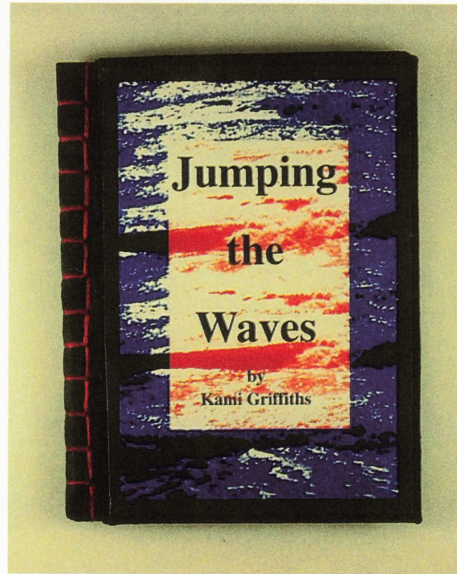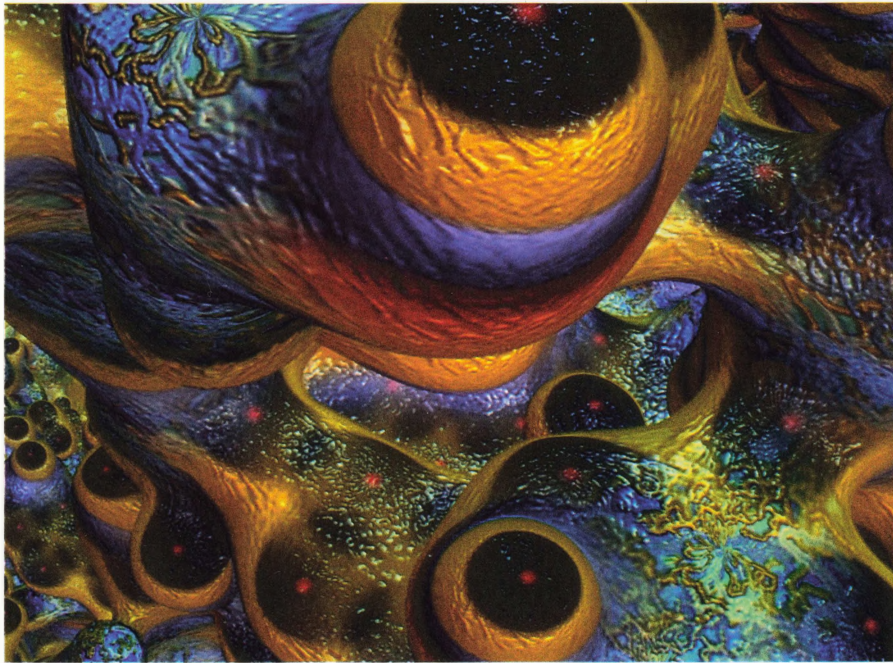
Andy Kopra

The Ornament of Grammar

10 books made from paper
8.5 x 8.5 x .5 inches (each book)
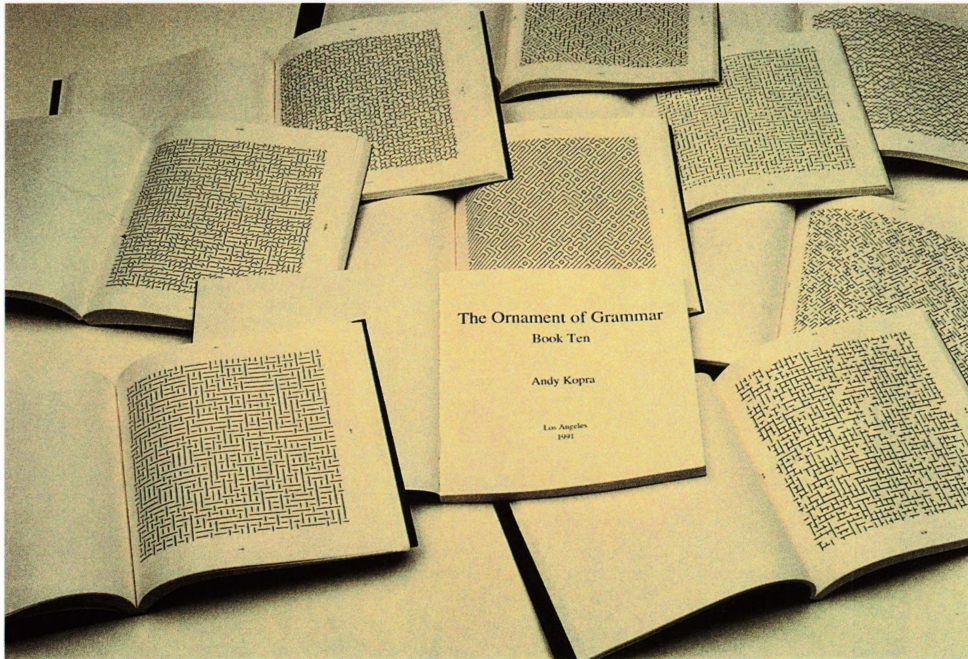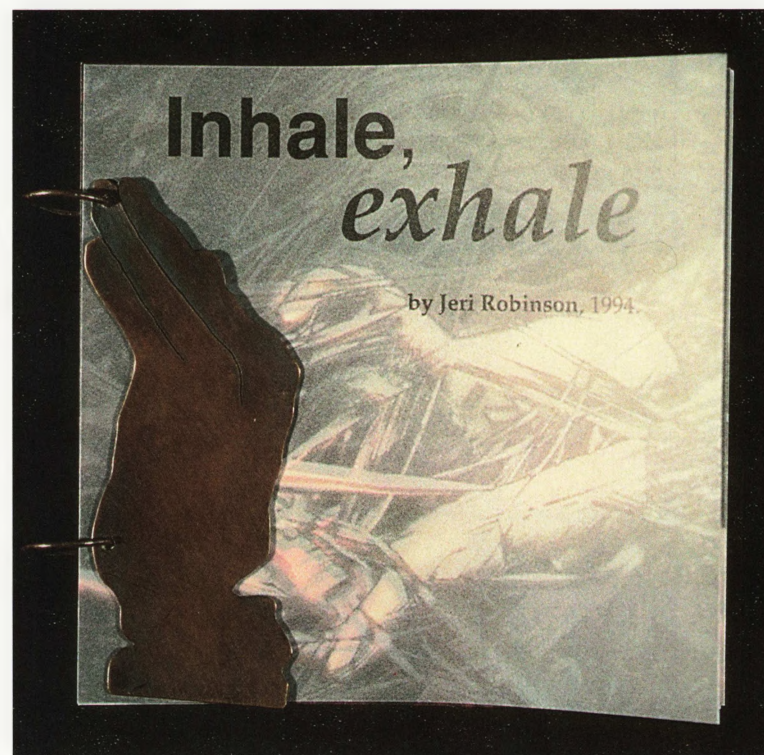
Starla Stensaas

Returning from West Africa to Fifteenth Street/Accordion Book

7 x 5 inches

Here,
your command kits between us,
the laundry
a tied stack of army blankets
for a cross-continent trek.

How much easier for me
(musoo, trabrilla, ba)
to take your small bag of summer clothes,
and go wash.

As if you are a stranger walking Fifteenth Street
I direct you to the laundramat with expansive gestures
and metal-edged voice,
quarters falling from my mouth to the sidewalk.

His two year tour with the Mandinka:

Setting moon hung low over steamy huts
as women prepare to leave for the rice fields,
    musoo   woman who has been with a man
    tabrilla   woman who cooks
    ba   woman with children.

N lafha ta kurola
I want you to go wash
and she goes
calling her daughters to wash,
returning, rising moon
and stone-beaten sweat socks from K-mart
balanced on her basketed hair.

Starla Stensaas

White Out

Artist book
7.5 x 6.5 inches

Collaborator
Gary Holthaus, author

Judith Yourman
Leona Book 1

Ink-jet prints
Artist book
8.75 x 10.5 inches

Each day the courtroom is filled with
lawyers, reporters and tourists.
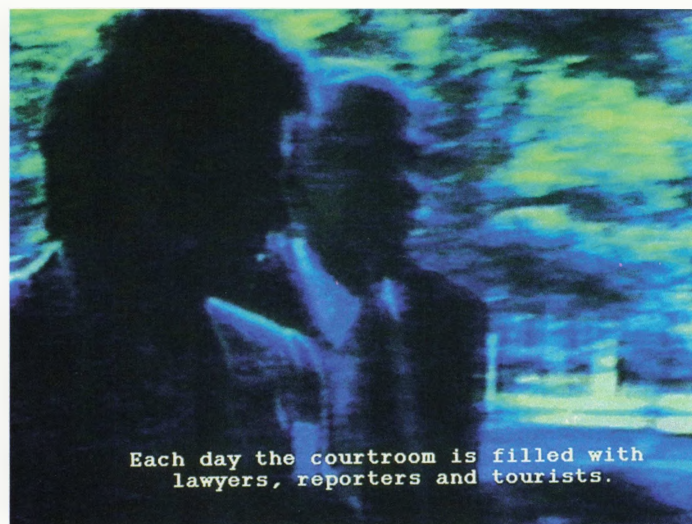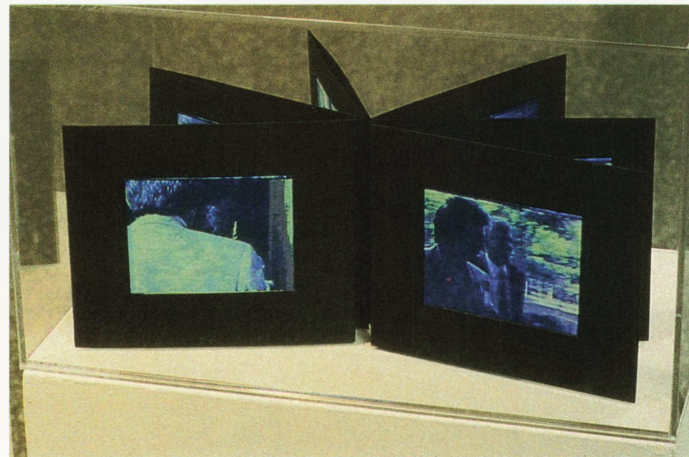
Cristina Almeida
*Study of a spoken
dialogue*

    3817 Eastern Avenue
    Cincinnati, Ohio 45226 USA

Don Arday
*Fire and Ice Chip
Stop Smoking*

    Arday Illustration
    616 Arbor Creek Drive
    Desoto, Texas 75115 USA

David Bleich
Divine 1

    Syracuse University
    104 Trinity Place
    Syracuse, New York 13210
    USA

David Bontempo
*rock 01
rock 02*

    448 West 19th Street #5B
    New York, New York
    10011-3846 USA

Charles Boone
Chapter 5

    1122 South Campbell
    Wheaton, Illinois 60187 USA

Jeff Brice
*Gravity
Quantum Qupids*

    2416 NW 60th Street
    Seattle, Washington 98107
    USA

Celeste Brignac
Kaos

    P. O. Box 3883
    Mississippi State, Mississippi
    39762 USA

John Caputo
Cathach

    Seminole Community College
    100 Weldon Boulevard
    Sanford, Florida 32773-6199
    USA

Denis A. Dale
*"Having said, the grass is
always greener ... in this
case it was." Flood series*
    Millennium Studios
    224 North Madison Street
    Stoughton, Wisconsin 53589
    USA

Jennifer DeBlock
*Disguise
Only A Part*

    University of Evansville
    1800 Lincoln Avenue
    Evansville, Indiana 47715 USA

Joseph P. DeLappe
*The Continuum: Husband
& Wife Starting To Look
Like Each Other*

    Department of Art 224
    University of Nevada, Reno
    Reno, Nevada 89557 USA

Jason Ditmars
*Mind and Body
Environment*

    Art Institute of Chicago
    4455 Vision Drive #1
    San Diego, California 92121
    USA

Keay Edwards
Untitled/Family
    San Jose State University
    13741-B Sarasota Avenue
    Sarasota, California 95070
    USA

Anne Farrell
Trump

    VideoGraphicArts
    131 Huddleson
    Santa Fe, New Mexico 87501
    USA

James Faure Walker
*A Pony in Clerkenwell
Die Formes: Flight*

    88 Greenwood Road
    London E8 1NE
    United Kingdom

Diane Fenster
*Canto One/The Aurora
Borealis
Canto Three/Circumstantial
Evidence
Unseen the threads are knit
together*

    140 Berendos Avenue
    Pacifica, California 94044 USA

Franz Fischnaller
*Lautriv
Chromagnon/Medusa*

    F. A. B. R. I .CATORS
    Via F LLi Bronzetti 6
    6/20129 Milano, Italy

Kurt Fleischer
Spike

    Caltech Graphics Group
    Caltech Mail Stop 350-74
    Pasadena, California 91125
    USA

Phillip George
Mnemonic Notations

    11 Miller Street
    Bondi 2026
    Sydney, Australia

Madge Gleeson
*None of Your Business
Thin Slice of Life*

    Art Department
    Western Washington University
    Bellingham, Washington 98225
    USA

Harvey Goldman
*Blue eyes in the Land of
Forgotten Moisture*

    University of Massachusetts
    at Dartmouth
    41 Fisher Road
    Westport, Massachusetts 02790
    USA

Kami Griffiths
Jumping the Waves

    St. Olaf College
    1500 St. Olaf Avenue
    Northfield, Minnesota 55057
    USA

Karen Guzak (jury member)
Geometries

    707 South Snoqualmie
    Studio 5A
    Seattle, Washington 98108
    USA

Lane Hall
*Woodland Goiter Series:
Mosshead
Spirochete
Waterbug*

    Teikyo Marycrest University
    1607 West 12th Street
    Davenport, Iowa 52804 USA

Jean-Pierre Hebert
Un cercle trop étroit

    4647 Via Huerto
    Santa Barbara, California
    93110 USA

David Heeger
People of the World

Department of Psychology
Stanford University
Stanford, California 94305
USA

Craig Hickman jury member
Fine and Applied Arts
Department
University of Oregon
5232 University of Oregon
Eugene, Oregon 97403-5232
USA

Michael Höpfel
Primo Tempore

Hochschule für Gestaltung
Offenbach a.m.
Untere Grenzstr. 36
63075 Offenbach a.M.
Germany

Yun-Kyung Huh
Self-portrait 3

207 East 27th Street #LC
New York, New York 10016
USA

Masa Inakage
Relation

The Media Studio, Inc.
2-24-7 Shichirigahama- Higashi
Kamakura, Nanagawa 248
Japan

Natalie Jeremijenka
LiveWire
Voice Box

Xerox PARC
3333 Coyote Hill Road
Palo Alto, California 94304
USA

Chris S. Johnson
eyesore

924 West Newport Avenue
#305
Chicago, Illinois 60657 USA

Yoichiro Kawaguchi
*COACERVATER: Artificial
Life Creation*

Institute of Art
University of Tsukuba
1-1-1, Tennodai,
Tsukuba Science City 303
Japan

Robin Kilgore
On Reflection

Fine and Applied Arts
Department
University of Oregon
5232 University of Oregon
Eugene, Oregon 97403-5232
USA

Midori Kitagawa De Leon
jury member
Life

Advanced Computing Center for
the Arts and Design
The Ohio State University
1224 Kinnear Road
Columbus, Ohio 43212-1154
USA

Andy Kopra
The Ornament of Grammar

4249 1/2 Moore Street
Los Angeles, California 90066
USA

Aviv Kruglanski

School of the Art Institute of
Chicago
1518 West Augusta
Chicago, Illinois 60622 USA

Susan Le Va
Another man/Another dog

Le Van/ Barbee Studio
30 Ipswich Street #211
Boston, Massachusetts 02215
USA

Ka-Sing Lee
City at the end of Time

Ka-Sing Holly and
Cameraworks
P. O. Box 13710
Number 5, Ground Floor
Prince Terrace mid-level
Hong Kong

Jean Paul Longavesne
Live Painting Creation

GRIP
64, avenue Jean Moulin
75014 Paris, France

Tony Longson
Pool #1

California State University
at Los Angeles
5151 State University Drive
Los Angeles, California 90032
USA

Ante Magzan
Crveno Br. 1973
War inside my head

16 Karen Drive
Watsonville, California 95076
USA

Kent Manske
Answers
Pedestals

33 Dexter Avenue
Redwood City, California
94063 USA

Guy Marsden
*Digital Numeric Relevator
Mk VII—Round Numbers*

ART TEC
1027 41st Avenue #3
Oakland, California
94601-4034 USA

Susan E. Metros
*good daughter, bad
mother, good mother,
bad daughter:
catharsis + continuum*

Department of Art
University of Tennessee
1715 Volunteer Boulevard
Knoxville, Tennessee
37996-2410 USA

Mark Millstein
Spill

Design Department
University of Massachusetts
at Dartmouth
285 Old Westport Road
North Dartmouth, Massachusetts
02747 USA

Glenn Mitsui jury member
Pulled Away

Studio M/D
1512 Alaskan Way
Seattle, Washington 98101
USA

Barbara Mones-Hattel
jury member
In the Fog

11125 Lake Chaple Lane
Reston, Virginia 22091 USA

Terry Monnett
Particulate Downbeat

Advanced Computing Center for
the Arts and Design
The Ohio State University
1224 Kinnear Road
Columbus, Ohio 43212 USA

Carlos Eduardo Muti Randolph
Vosco, Dumbo and Duvel

Muti Design
Avenida Atlantica
3576/501 Rio de Janeiro
Rio 22070-001 Brazil

Barbara Nessim
Common Sense in Short Supply
Seeking Monumental Status

63 Greene Street
New York, New York 10012
USA

Leslie Nobler-Farber
Golden Girls' Security

William Paterson College
14 High Street
Demarest, New Jersey 07627
USA

Niki Nolan
Candy Box—In Progress
Greetings from Chicago

SAIC Loyola Columbia
2939 West Belmont
Chicago, Illinois 60618 USA

Peter Patchen
Listening to the past
Unbounded Ingress

University of Toledo
135 Bergin
Rossford, Ohio 43460 USA

Lynn Pocock
Linger: Things Left Behind

Pratt Institute
77 Fornelius Avenue
Clifton, New Jersey 07013 USA

Bob Powell
Connections

Rhythm and Hues Studios
910 North Sycamore Drive
Hollywood, California 90038
USA

Jeri L Robinson
Inhale, Exhale

Art Department
Millersville University
Millersville, Pennsylvania
17551 USA

Cynthia Beth Rubin
November Memories

Art Department
Williams Hall
University of Vermont
Burlington, Vermont 05405 USA

Ron Saito
Adam names the animals

1603 East Third Street #318
Bloomington, Indiana 47406
USA

Karin Schminke
Dream Cycle IV

Unique Editions TM
5803 NE 181st Street
Seattle, Washington 98155
USA

Geri Smith
Head III

330 East 43 Street #104
New York, New York 10017
USA

Dennis Staffne
Circle of Grass II

Northern Michigan University
401 West Ridge
Marquette, Michigan 49855
USA

Starla Stensaas
Returning from West Africa to Fifteenth Street/
Accordion Book
White Out

Art Department
011 Dana College
Blair, Nebraska 68008 USA

P. Kevin Thomason
Journey #4

Texas A&M University
811 Harvey Road #11
College Station, Texas 77840
USA

Jerry D. Threet
What is Love?

1746 Meridan Avenue
Apartment 41
Miami Beach, Florida 33139
USA

Anatoli Tsibin
Congress

D*ART group,
RCC "Kurchatovski Institut"
Vadkovsi Street h 20
apartment 23
103055 Moscow Russia

Nicolai Tsibin
Wind fair wind

D*ART group,
RCC "Kurchatovski Institut"
Vadkovsi Street h 20
apartment 23
103055 Moscow Russia

Anna Ursyn
Monday Morning
Two Moons

University of Northern Colorado
Department of Visual Arts
Greeley, Colorado 80639 USA

Roman Verostko
Illuminated Universal Turing Machine

5535 Clinton Avenue South
Minneapolis, Minnesota 55419
USA

Clea T. Waite
Nothing Broke but the Heart

Academy of Media Arts,
Cologne
Peter-Welter- Platz 2
D- 50676 Cologne Germany

Karen White
Link

Art Department
University of Hawaii
2535 The Mall
Honolulu, Hawaii 96822 USA

Nathan S. Williams
Cybatic

321 1/2 East Main Street
Starkville, Mississippi 39759
USA

Leslie Wilson
Ladies Dance

24 Washington Avenue
San Rafael, California 94903
USA

McCrystle Wood
Bodies of Water #1

University of Cincinnati
2401 Ingleside Avenue
Cincinnati, Ohio 45206 USA

Judith Yourman
Leona Book I

1900 Princeton Avenue
St. Paul, Minnesota 55105 USA

Introduction

I have been teaching art and practicing art for almost 30 years. I love the inquiry, exploration, invention, and transformation in the processes involved in the forming of art. In a word or two, it is the "total experience" that leads to the thing we call art. Please look at the SIGGRAPH 95 Art Gallery in this light. Imagine the inquiry and experience that was involved in producing what you see and what you experience. Read these two essays with the idea that behind the art is an experience and idea that we hope to understand.

James Faure Walker of London has written a very fine personal view of a painter and teacher trying to bridge the gap between painting and the computer. He has taken ideas from his experiences in both forms and presents them for us to consider. It so happens that his work was also selected for the Art Gallery and so you can see, first-hand, his art work on display.

Starla Stensaas, who teaches at Dana College in Nebraska, has written an excellent theoretical essay discussing the shift in thinking from oral and print forms into the electronic digital culture of today. Starla, an artist working in this area between print culture and digital culture, is also represented by her artist's books in the SIGGRAPH 95 Art Gallery.

Ken O'Connell

SIGGRAPH 95
Art Gallery Chair

TEACHING CYBER ART, OR HOW A PAINTER COPES WITH COMPUTERS IN LONDON

by James Faure Walker

Abstract

Walking back from my painting studio on a summer evening, looking up at the electronic flicker of TVs, I do wonder... how can a painting do anything in a living room? Does the future lie in the hands of the cyber artist? Hold on. I am a painter, and I use computers, and that combination makes a lot of sense, though nowhere in England can you study - or teach - the two together. Computer work is a different kind of art because it's cyber-this or cyber-that? Oh. Even when it's flavor-free? At ISEA 5 in Helsinki I wandered out of the interactive show and got absorbed in the early 20th Century Finnish painting next door, self portraits in log cabins, a solitary fir tree losing its snow. Spring. I resolve to give my work more of a lived-in texture, make it connect with what I saw, give it a temperature, make it more reflective.

THE TRANSFORMED AND
TRANSFORMING IMAGE IN
THE SHIFT FROM PRINT TO
DIGITAL CULTURE

by Starla Stensaas

Abstract

This paper investigates issues germane to "reading" images in a digital medium by considering both visual language as it is constrained by hardware and software, and visual culture as it is changed by a medium that pushes us towards a thought idiom that embodies multiplicity and simultaneity.

Images in and of a culture reflect our cultural understandings of ourselves. Images in any culture are constantly changing, and as they change, they transform the culture. Likewise, as a culture undergoes change, the images of the culture are transformed. In this way, image and how we read images are both the trace element of and a visual wake following the shifts in our collective understandings. Image operates both as an integral part of an organic, changing energy system that generates momentum towards a culture shift and as a footprint that references visual metaphors in describing a cultural shift that is taking—or has taken—place.

To understand the transformed and transforming nature of images in culture, we must first understand the components of the image, particularly the compositional or visual language and the cultural context of the image. What sits between the visual language and the cultural context of the image is the medium in which the image appears. It is not that the medium is the message as Marshall McLuhan has suggested; rather the medium creates both a cultural context and a medium-particular visual language, contributing significantly to the meaning we "read" from an image.

Medium in a larger sense designates the boundaries of our collective understandings – our epistemology – in the ways in which it is integral to both how we "read" the cultural context and visual language of the text and how that constructed "reading" defines our thought idiom. Just as the medium in a fine arts context creates a medium-specific visual grammar and a cultural context from which the artist is able to

shape an image from his or her own inner vision or knowing, so too does medium in the larger sense define what kinds of "pictures" we collectively create to understand or know the world. In this way, the digital medium is much more than a new tool or toy used by visual artists. Rather, this paper argues that our tentative steps towards using this new medium represent a shift as significant as the move from oral culture to print culture – that we are in the midst of a shift from print culture to digital culture.

Through a comparison of images based on Manet's Luncheon on the Grass and the Mona Lisa, this paper lays a foundation for similar comparisons of hypertexts which use visual images. By looking at the characteristics of digital visual language and cultural context and noting the similarities and differences between them and the more familiar print culture visual language and cultural contexts, this paper considers issues germane to reading images in the digital medium.

Chair

Ken O'Connell
University of Oregon

Administrative Assistant

Becki Parker

Assistant

Jim Gibson

Committee

Larry Cuba
Special Projects

Linda Ettinger
Critical Essays

Eduardo Kac
Artist/Designer Sketches

Lynn Pocock
Publicity

Patric Prince
Traveling Art Show Chair

David Stairs
Artist's Books

Ying Tan
On-Site Gallery

Anna Ursyn
Gallery Support

Victoria Vesna
Interactive Artists

Mike Whitenack
Space/Exhibit Design

Art Gallery Jury

Karen Guzak
Independent Artist

Craig Hickman
University of Oregon

Midori Kitagawa De Leon
Ohio State University

Glenn Mitsui
Studio M/D

Barbara Mones-Hattal
George Mason University

The Art Gallery Chair invited the jury to show their own work, to give attendees some insight on the jury's creative perspectives.

Karen Guzak
Geometries

2D Artwork
Enamel on steel
61 x 91 inches
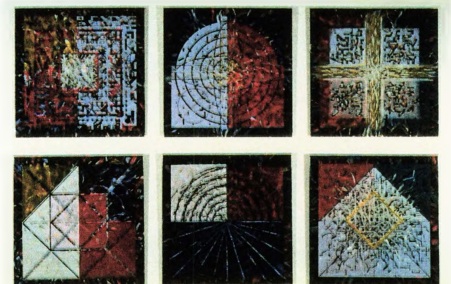
Ante Magzan

War inside my head

Interactive computer display

Bob Powell

Connections

Mounted Iris Prints, video
monitors, and VCRs
10 x 10 inches

Collaborators
Chris Perry
Greg Keith
Kristy Nielson

Clea T. Waite

*Nothing Broke but the
Heart*

Monitor and transparencies:
mixed media
300 x 400 x 500 cm

Collaborators
Kunsthochschule für Medien
  Koln
Advanced NMR Systems
MIT Media Laboratory
GMD, Visualization Group

Natalie Jeremijenka

Voice Box

Interactive
1-inch cubes

Live Wire

Electronic sculpture
8 x 1 x 1 feet

Midori Kitagawa De Leon

Life

2D Artwork
Cibachrome
8.125 x 12 inches

Collaborator
Tom Benoist
Interactive Effects, Inc.

Glenn Mitsui

Pulled Away

Digital Illustration
Iris print on rag paper
30 x 40 inches

interactive entertainment

introduction

Isaac Victor Kerlow

Chair

Interactive Entertainment

SIGGRAPH 95 Interactive Entertainment projects represent current trends, outstanding work, and original points of view in location-based entertainment, games, and interactive television. They demonstrate new levels of both creative and technical sophistication in a variety of ways. Some of the imagery, for example, is exquisite in its rendering. Several graphical interfaces go well beyond pointing and clicking. Some of the technology used is simpler than one would have imagined, yet the results are impressive.

Interactive Entertainment does not present a unified vision of the field. Some projects are slick products that are meant to be successful in the mainstream market. Other projects are explorations into new forms of entertainment that are not yet ready for commercialization. This apparent contradiction between creative directions is the engine of Interactive Entertainment.

Interactive entertainment means different things to different people. For some, conversing interactively over tea and cookies is entertaining. For others, this kind of activity can be boring and perhaps too interactive. Competing with imaginary opponents and defeating them through violent virtual destruction or scoring more goals is a satisfying interaction for many, and also their ticket to first-class entertainment. Others may find this kind of competition horrifying. And there is always good-old movie-watching, which is exciting for some and sleep-inducing for others.

The fact that there are so many ways of interacting and entertaining is an important issue for professionals and entrepreneurs of interactive entertainment. As we rush to produce the perfect game or the most stimulating entertainment, we can learn a lot by analyzing traditional forms of interaction and entertainment.

There are clearly many different concepts of what is truly entertaining and what is true interaction. This is an obvious point. What is less obvious is which of these concepts has the right combination of technology, imagery, plot, and pricing to be successful with the various potential audiences for interactive entertainment.

So far we seem to have focused most of our energies on the variety of interactivity that is based on quick reflexes and limited dialog. This has led to creation of very sophisticated action games for distribution in both public areas (arcades) and private environments (homes). In these games, searching for and destroying the enemy is invariably the main priority, and impeccable hand-eye coordination is a condition for survival. But increasingly, as technology improves and as game plots get more ambitious, many action games are trying to incorporate more realistic imagery and motion. These improvements are based on technological developments like faster and more powerful hardware, more efficient software, enhanced character development, and improved plots that allow a multitude of story lines.

There is also an increasing selection of successful games that require more analytical skills. Many recent examples in this genre also include stunning imagery. More ambitious plots are emerging, and the creative potential is limitless. How about more games based on history, or real murder cases? How about crashing the stock market for fun? Or rescuing the World Trade Center in Manhattan from terrorists who have taken it over? How about playing with our cultural myths? What if we have, for example, been charged by Zeus to stop Hera's jealous attacks on his mortal girlfriends? Or what if we have been called by the desperate members of a neighborhood watch to assist in eradicating drug dealers from their neighborhood, but one of our team is corrupted and sabotages our plans? How about the trials and tribulations of the slaves escaping through the underground railroad? What if the American Indians had defeated their attackers? What if male players in a game could only play female roles?

It is essential to keep in mind that the goal, from the audience's point of view, is not about technology at all. It is about being entertained, about being captivated by a story, or challenged by a mystery, or about fooling our senses and being transported to worlds of fantasy. That's Interactive Entertainment.

CONTACT
Isaac Victor Kerlow

SIGGRAPH 95 Interactive Entertainment Chair
Chairperson, Department of Computer Graphics and Interactive Media
Pratt Institute
200 Willoughby Avenue, PS21
Brooklyn, New York 11205 USA
+1.718.636.8134
+1.212.675.8161
kerlow@siggraph.org

INTERACTIVE ENTERTAINMENT COMMITTEE

Red Burns
New York University

Clark Dodsworth
Fujitsu Cultural Technologies

Terrence Masson
Digital Fauxtography

Celia Pearce

Bruce Sinclair
Alias/Wavefront

3D Virtual Theater is a stereoscopic three-minute virtual thrill ride that offers the audience the feel of a wild simulation experience. The 3D sound system is directly linked to the vibration seat, so every participant is completely immersed in the journey. A high-resolution head-mounted display enhances the special effects of the surrounding 3D images flying off the screen. Several different experiences are available, including fly-throughs of computer networks, psychedelic tunnels, and ski races down the Swiss Alps. Participants not only watch the show, they also become part of the adventure.

Background

StrayLight Corp. began four years ago with creation of PhotoVR, a PC-based software package. Soon afterward, the company moved into the location-based entertainment market with CyberTron, an immersive virtual reality experience based on a multi-ring gyroscopic platform. As the developer of all CyberTron games, StrayLight often customizes the VR software to accommodate special purposes and different themes.

The CyberTron allows an audience throughput of 10 to 20 participants per hour. 3D Virtual Theater was developed in response to StayLight's customers' demand for increased throughput. The first 3D Virtual Theater was built in May 1994 for CableTron Systems, where it achieved a throughput of over 300 participants per hour. The theater is designed modularly, so each installation can be expanded to handle thousands of people per hour. The success of StrayLight's first installation proved that the virtual-theater concept is ready for high-traffic locations such as museums, science centers, and theme parks.

Since the first 3D Virtual Theater installation, StrayLight has enhanced the experience with 3D stereoscopic imagery and impact seats. The 3D system is directly linked to the vibration seats, so that every audience member is completely engrossed by the rumbles and roars of the virtual experience. Three-dimensional effects are generated with uniquely formatted visuals for each eye. Every frame is rendered twice, once for the left eye and again for the right eye, and then merged into a single image.

Fully interactive virtual reality theaters will be the next stage in the theater development process. Audiences will share the excitement of attending a theatrical experience in which they not only control the complete story line but become part of the whole adventure. Since the software can be easily updated, each theater can offer a large variety of virtual experiences.

StrayLight Corp.
Victoria Massulli
150 Mount Bethel Road
Warren, New Jersey 07059 USA
+1.908.580.0086
+1.908.580.0092 fax
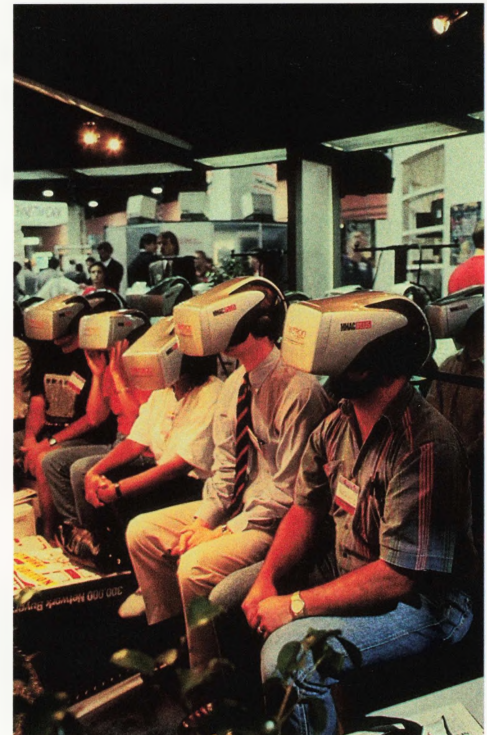
Hellraiser

On a journey to Hell's labyrinth, players are challenged with numerous obstacles including Pinhead and his apostles, an internal clock, and a multitude of clues. Play culminates with the ultimate battle of contestants and Pinhead in Hell's labyrinth. Hellraiser, which builds on the popularity of Clive Barker's cult classic to provide over 60 hours of entertainment, will be released in 1996.

&
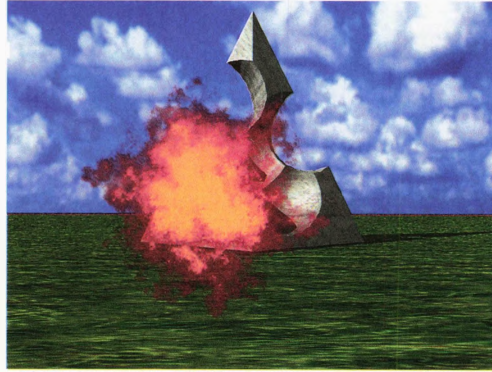
Icebreaker

Icebreaker combines the impulsive fun of an arcade-style game with the intellectual problem-solving aspects of a fast-paced strategy game like Tetris. The game is set in a highly abstract and surreal world in which your enemies are animated pyramids that have come to life and must be destroyed. Icebreaker is scheduled for a 1995 release.

Magnet Interactive Studios, Inc.

Matt Elson
3255 Grace Street, NW
Washington, D.C. 20007 USA
+1.202.625.1111
+1.202.625.1353 fax
elson@aol.com

Hardware/Software

Silicon Graphics
Macintosh
IBM PC
Alias
SoftImage
Matador
Macromedia Director
3D Studio
Adobe Photoshop

At SIGGRAPH 95, Iwerks Entertainment presents its latest Reactor attraction: Dino Island. In a simulated all-terrain vehicle, the audience explores a newly-discovered volcanic island and encounters many thrilling and frightening incidents, accidents, and face-to-face encounters. The goal of the adventure is to rescue the local dinosaur population by capping the volcano's mouth.

Iwerks Reactor, an 18-seat portable simulation theatre, creates a "you-are-there" sensation by allowing the audience to move in synch with high-definition, 9-foot by 16-foot images. It is one of several portable versions of Iwerks Entertainment's ride simulation and 360-degree theatre attractions. The company's Touring Technologies Division deploys these attractions at major events throughout the world.

Iwerks Entertainment
Vito Sanzone
4100 Newport Place, Suite 770
Newport Beach, California 92660
USA
+1.714.756.0900
+1.714.756.8942 fax

In Injection, Tom White focuses on creating intelligent, artificial artists, each with its own identity. This project is a continuation of ideas explored in his collaborations on other interactive environments, such as Small Planet in the SIGGRAPH 93 Tomorrow's Realities exhibit and Voice Dancer in SIGGRAPH 94's The Edge.

Injection enables full-bodied interaction between participants and a projection screen controlled by virtual "artists" residing in a Power Macintosh. These artificial artists, which generate a continuous stream of images on the screen, are created using a variety of genetic algorithms, including artificial evolution. Each has its own method of picking which stimulus to respond to and deciding how to embody its perceptions in a two-dimensional snapshot.

The work of the virtual artists has been judged on three criteria: aesthetic interest, continuity between frames and between works, and responsiveness to the participant's behavior. Based on this evaluation, certain artists were selected and created. Each has its own perception of the world and outward expression of what it experiences.

Background

Computers have been used to create MetaArt, a new area of expression in which the artist produces an intermediary intelligence, which actually produces the work of art. In this way, artists are able to impose values and tastes on a virtual entity at will and produce a piece of work that is once removed from the original creator.

Computers have also been used to create environments in which the meaning resides primarily in the interaction. These interactive works have traditionally engaged the viewer in short experiences that break the traditional boundaries of art by actively involving participants in a series of never-replicating environments. No two experiences are the same.

Injection attempts to merge these two approaches by creating virtual artists that are responsible for observing the behavior of participants and expressing what they see in an ever-flowing abstraction of these perceptions. The perceptions available to the virtual artists include traditional cameras and microphones, as well as perceptual abilities that human artists do not have, including the ability to view the infrared spectrum. The artist observes, expresses, judges, and presents itself to the participants all within a fraction of a second, so that participants feel the continuity between their behavior and the artist's interpretation of that behavior. The artists usually perform solo, though some may prefer to collaborate with other virtual artists to create a union of different ideas.

The constantly updated expression of each artist is fed to an external projector which is directly in front of the participant. If an artist is particularly happy with an interaction, it may choose to print its work on an attached poster color printer. There are no pre-defined rules for interaction. The nature of the interaction, including its duration and personal involvement, constantly changes to meet the needs of the participants.

Graviton

Tom White
P.O. Box 829
Athens, Georgia 30603-0829
USA
+1.706.548.4332
TWhite@dcs.uga.edu

Hardware/Software

Power Macintosh
Two cameras
Custom software
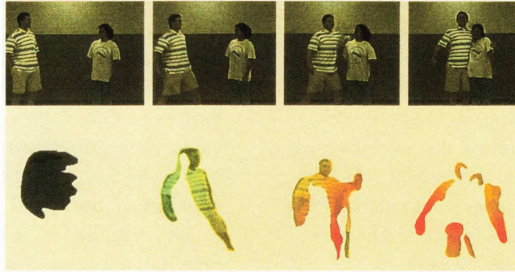
The New York University Media Research Laboratory (NYU-MRL) aims to create a sense of social space and interaction, to create virtual actors that respond believably in social ways in real time, without the intervention of human puppeteers, and to effectively use a distributed network for computing the behavior of the virtual actors. These are enabling technologies for interactive television and embodied metaverses.

History

In 1985, NYU-MRL used pseudo-random functions to create natural surface textures of surprisingly realistic appearance without modeling the underlying physics. This work led, for example, to a popular texture "noise function," the skin on the "Jurassic Park" dinosaurs, and the atmosphere effects in "The Lion King."

Last year, the lab applied the same approach to the problem of building real-time graphic puppets that appear to be emotionally responsive. Instead of trying to model the correct physics of human movement, they applied noise functions, together with rhythmic motions. The results, which were surprisingly lifelike, can be used to convey very subtle expressions of personality and body language. They were demonstrated in the short film "Danse Interactif" in the SIGGRAPH 94 Electronic Theatre.

NYU-MRL shares an interest in real-time parallel computation with the Laboratorio de Sistemas Integraveis at the University of Sao Paolo. Together, the two labs have now successfully extended these techniques to real-time social interaction between groups of puppets.

Basic Functionalities

In this project, participants enter a darkened corridor and see a virtual room through a "picture window." A few virtual people in the virtual room are interacting socially with each other. The virtual room is rendered on a Silicon Graphics workstation and rear projected via a high-resolution projector. A ceiling-mounted video tracker tracks each participant's position. There is no trained operator intervening in the activities. Naive participants interact on their own, in complex ways, with the virtual actors.

The virtual people in the virtual room interact with each other. They move about, perhaps give each other things, look out the window, or shake hands. It's a typical social gathering. To the participant, their "talking" is heard as indistinct murmuring. It is clear that they are talking (even their tone of voice can be discerned), but it is not clear what language they are speaking.

The participants are interesting to these virtual people. One or two of them might glance over to see what a participant is up to. Another might walk over to

the "window" and peer at the participant. As the participant moves about, virtual people follow the movements with their eyes. One might point, or wave. If the participant knocks on the window, one of them might knock back, and the sound is audible. If the participant gets too close, the virtual person near the "window" steps back, to maintain a safe distance. Two or more people might argue about the participant's presence, pointing and waving or raising their voices. Participants try to get the attention of the virtual people in the virtual room. They try to be noticed, and to provoke a reaction.

To the participant, the virtual people seem to be from another country or even another planet. They do not speak the same language, but there is an attempt to communicate, mostly through body language.

Technical Information

Each actor is computed on a different computer in a local area network (LAN). They communicate with each other over the LAN in real time at interactive frame rates. The actors actually pass entire behavior procedures to each other over the network at each animation frame, giving each other complex instructions and hints on how to respond to each other and allowing them to coordinate their responses to the participant.

The behavior description language that is passed around the network is the same language that was originally developed for NYU-MRL's interactive texture work in 1984. It has special features not usually found in programming languages (including very lightweight procedure definitions and a powerful method for fast dynamic scoping) that are necessary to realize this sort of performance.

Research Agenda

This research focuses on situations in which people communicate richly through body language, such as parties, bar scenes, and meetings. The goals of this project include:

- Creating a sense of social space and interaction.
- Making embodied characters believable and responsive to users in real time.
- Effective use of a distributive network for computing the behavior of actors.
- Generating "suspended disbelief" among the participants, so they feel the experience is really happening.

In particular, NYU-MRL is exploring how to convey peripheral awareness, approach/avoidance, "paying attention," "listening," etc. The lab also studies immersive scenarios involving two or more walls, to determine how simulated body language will help to convey the impression of various competing social or attention-getting activities.

Ultimately, NYU-MRL's goal is to determine to what extent the mere rhythm of interpersonal interaction can be encoded, in order to convey the impression of social complexity. For example, could one structure entire narratives in this manner?

Assessment of Potential Future Impact

Consider this possible scenario: you send your "agent" to the Metaverse library to get some information. Along the way, the agent encounters your neighbor strolling the Metaverse. You've already told your agent that if she encounters this person, she must remind him of your lunch date tomorrow.

Alternatively, for networked video games, this NYU-MRL work demonstrates that it is feasible to generate fully 3D, interactive characters. This allows networked video games to break away from the current restrictive reliance on canned CD-ROM-based video footage and animation clips.

This project also shows that it is feasible, using current technology, to apply these techniques non-invasively. People can interact in their own homes with real-time personal agents who have convincing and interesting personalities and live behind wall-size screens. Such agents can be used for entertainment, information access, or simply for company.

New York University Media Research Laboratory
Athomas Goldberg
715 Broadway
New York, New York 10003 USA
+1.212.998.3469
+1.212.995.4122 fax
athomas@graphics.cs.nyu.edu

Author
Ken Perlin
New York University Media Research Laboratory

Collaborators
Maria Augusta
Leo Cadaval
Troy Downing
Athomas Goldberg
Mehmet Karaul
Kouchen Lin
Dan Moss
Ruggero Ruschioni
Eduardo Toledo
Daniel Wey
Marcelo Zuffo

Hardware/Software
Silicon Graphics IndyXZ
Presenter
Two 200 MHz Silicon Graphics Indigo2 Extremes
Macintosh Quadra 840AV
Rear projection screen
Four speakers
Ceiling-mounted miniature video camera
Procedural animation software created at NYU Media Research Lab
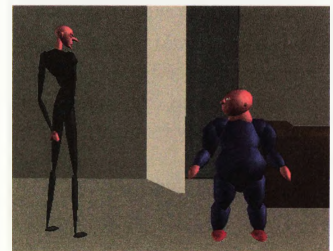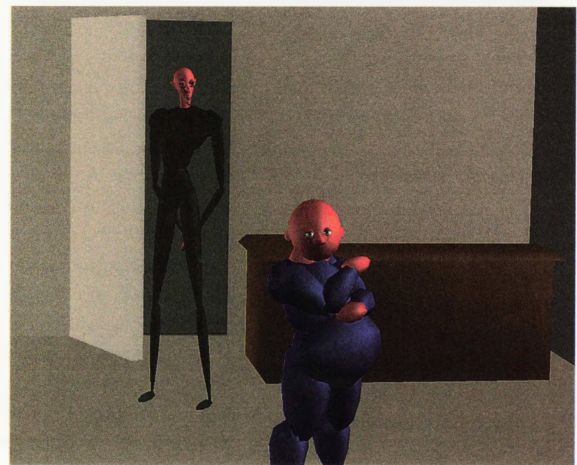
Stepping into the deep blue interior of the Vivid Group's Turbo Kourier module, the participant's image is introduced into an interactive computer-generated environment and projected on a video screen. The outcome of the experience is determined by the participant's control of an animated "skyboard" that passes over a scrolling futuristic landscape. Participants must move quickly to collect objects that fly around them while avoiding obstacles and opponents.

The Mandala Technology

The Mandala Virtual World System uses a video camera to display a participant's image superimposed over computer-generated graphics. Moving in front of an Ultimatte Blue screen, the Mandala participant watches the interaction on a video monitor. Participants can interact with 3D graphic objects on the screen while controlling their movements through the environment. This mode of interaction allows completely free, entirely unencumbered interaction with the virtual environment.

The Turbo Kourier Game

Turbo Kourier places the player in the role of a futuristic courier riding a gravity-defying skyboard. The object of the game is to collect packages and energy-increasing elixir while avoiding hovering animated opponents. Players use exaggerated gestures in front

of the camera to control their on-screen images as they move through full 3D-rendered foreground and background graphics and a compelling sampled soundtrack.

One of the most notable features of the game is how players control their images to "fly" around the screen. In order to achieve this form of video manipulation, the Vivid Group reduced the size of the digital image so the system can interpret not only directional cues but also the speed with which players move. Another unique feature in this new Mandala game is the directly controlled scrolling background image, which, combined with three-dimensional graphic images, gives the game a traditional video game feel with a cutting edge look. Turbo Kourier also gives players the opportunity to display their images on a continually updated "Top Ten" screen, which stores video "snapshots" that are repeated with each game played and during the attract loop.

Potential Future Impact

There is considerable interest in non-violent interactive entertainment that encourages participants to use their entire bodies as they play a game. The next step for the Mandala Virtual World System will lead to a stronger emphasis on networking modules and environments in order to allow people to share interactive experiences.

The Vivid Group
Steve Warme
317 Adelaide Streeet West
Suite 302
Toronto, Ontario M5V 1P9
Canada
+1.416.340.9290
+1.416.348.9809 fax
diego@utcs.utoronto.ca

Hardware/Software
The Mandala Virtual World System plus module Mandala software

MEKTON

The Year is 2177. A hundred years ago, the United Earth Government established a stable transgalactic gate outside the orbit of Pluto. Mankind finally burst the chains that had bound it to a single remote yellow sun, and humanity exploded throughout the stars, enveloping other races and civilizations in a meteoric expansion.
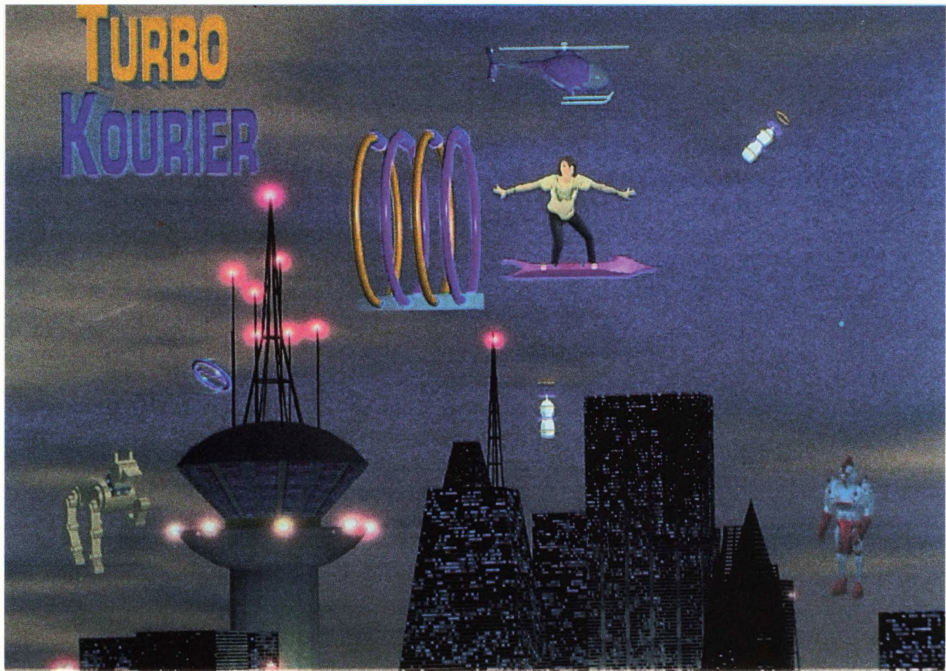
As with any far-reaching stellar empire, humanity has problems maintaining control in its far-flung planets and stations. Pirates – rebel humans seeking independence from the "oppressive" government – have declared open war on the human empire. They're sabotaging starships, colonies, and other facilities with impunity.

Another dangerous threat is the Aggendi, a reptilian race that has developed bio-mechanical war machines, very similar to the humans' Mektons (giant humanoid robots). The Aggendi are using these machines to invade human space and destroy any installation that they encounter. They seem to have no desire for self preservation and always fight to the death.

To protect vital space holdings, the Earth Government has created a space-wide militia, the Terran Defense League (TDL) to combat the pirate menace. Armed with Mektons, the TDL has managed to nearly stop all organized pirate activity. But recently the pirates have been stealing and building their

own Mektons, a situation that has the Earth's officials very worried.

Scenarios

TDL: As a member of TDL, you have been assigned to protect the recently constructed Sunfire One colony in the Beta Crucis system, the vital link between the Rim Systems and the Core. Processing facilities for most of the heavy hydrogen fuels needed by the Earth Sector Fleets are located there. Both the pirates and the Aggendi have tried several times to seize this vital resource, only to be fought off in savage battles that have cost the TDL dearly.

Pirate: As a member of the Pirate Fleet, you know you must have access to the supplies of hydrogen fuels the Earth Government has stockpiled in the Beta Crucis system. And you are prepared to face any danger, even the TDL's advanced Mektons, if that's what it takes to get those vital stockpiles.

The battle is about to be joined. Who will be the victor? Who will finally rule the world of Mekton?

The System

Mekton has been developed with the Activision module, ported to Silicon Graphics computer systems, and licensed to third parties, a venture that will encourage demonstration of a 3D interactive Mekton game.

The game is networked so that players can interact with each other either as friends or adversaries. In each frame, a packet is sent out updating the position and state of the Mekton. The packet also contains velocities and a time stamp so that a time-accurate position can be generated for systems not running at the same frame rate. Because permanent changes can be made to the environment, there is also a query process, in which a system joining the game can query systems that are already playing about environmental changes.

Mekton has been designed to work well with the default set of I/O devices included with SGI computers: keyboard, mouse, and microphone for input, and screen and audio for output. It also works with a variety of third-party devices such as joysticks and HMDs.

Silicon Graphics, Inc.
Dave Ligon
2011 North Shore Boulevard
Mountain View, California 94043
USA
+1.415.390.3502
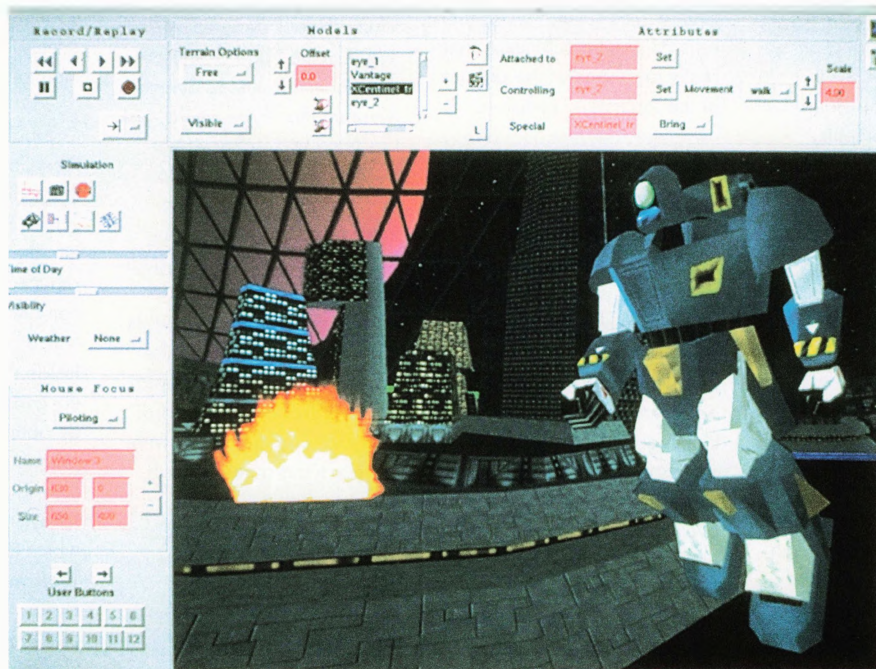
The REALWare VR system utilizes "unencumbered" virtual reality. The player interacts with the program by wearing a colored cotton glove. A video camera focuses on a chromakeyed player standing before a blue wall and inserts the player's image into the virtual environment, which can appear on everything from a TV monitor to a projection system to a videowall. As the player moves in the virtual environment, a computer tracks the colored glove and reacts to its motion, creating an array of possible activities in the virtual world.

Watching themselves in the projected virtual environment, players can use their gloves to grab, throw, catch, move, and block objects. They can "fly" around the virtual world. They can become smaller or larger. They can engage in solo experiences or compete against a second player. When more tracking cameras are added, more players can participate. Their competition can be at the same location, or they can compete across any distance.

The REALWare Platform

REALWare runs on two 80486-based PCs, one for simulation and video control, and the other for tracking. The system has been steadily shrinking as better PC video hardware becomes available; the whole setup currently occupies a single enclosed system rack. Upcoming improvements will reduce the system to a single PC.

The simulation software was developed in-house in C++. As much as possible, the code shelters the application designer from the hardware. Adding a new object to the virtual universe entails creating a finite-state machine that governs the entity's behavior and attaching to it associated graphics and sounds. The simulation engine runs the state machines concurrently and handles the physics of the forces and collisions.

Optical Tracking

The optical tracking system, also developed in-house, returns the location of the centroid of the user's gloved hand 30 times per second. Participants are scanned at the beginning of a simulation to determine the colors of their clothing. Then the system selects a glove color that has the least chroma/luminance overlap with the clothing colors. Color calibration is fine-tuned in a 30-second procedure in which the participant "touches" a series of virtual objects.

Tracking is sufficiently accurate to allow gesture interpretation. In Virtual Hoops, for example, dribbling the ball is accomplished by making a dribbling motion with the gloved hand, and shooting by making a shooting motion. The ball is hurled with a force determined by the speed of the hand during the throw.

Games

Virtual Hoops, a one-on-one basketball simulation, showcases the latest version of the REALWare software. In Virtual Hoops, computer-controlled opponents are high-resolution, digitized human actors who steal balls, block shots, and are generally menacing. Virtual Hoops debuted in April 1993 at the Edge Gallery in the Franklin Institute's Science Museum. For three weeks, visitors lined up to play virtual basketball and lingered for long periods of time. One interesting discovery during the Franklin run was that audience members actually applauded when participants did well. In the minds of the viewers, the game transcended the solitary nature of ordinary video games. They were experiencing a new kind of spectator sport that transformed the Virtual Hoops player into a sports star whose success was met with fan approval.

In June 1993, Virtual Hoops moved to the new Liberty Science Center in New Jersey. Its success there has been so extraordinary that CCG and Liberty Science have teamed up to take the Virtual Hoops show on the road to museums around the world. In the past two years, the game has also made enormously successful appearances at dozens of trade shows and special events, including the NBA Jam Session, the ACC Tourna-mania, and the NCAA Hoopla.

Plax Power is a captivating REALWare experience that allows participants to battle plaque inside a virtual mouth. The program combines computer-generated graphics and cel animations to carry the participant into the mouth to fight pesky plaque, anthropomorphized as small, hairy varmints. They become the enemy in a virtual battle to maintain oral health.

Computerized images of the Plax Control Center created the context and setup for the game. Players are scanned into the environment and reduced in size so that they can finally enter the mouth, which appears on cue. Once inside the virtual mouth, players can move around simply by pointing a hand. As the plaque creatures attack, players can dowse them with sprays of Plax mouth rinse, which loosens the creatures. Then, switching to the brush mode, they brush the loosened plaque creatures off the teeth. Players receive a score that reflects how many plaque creatures they killed within the allotted time.

CCG MetaMedia, Inc.
Jeff Atlas
460 West 34th Street, 7th Floor
New York, New York 10001 USA
+1.212.268.2100
+1.212.268.2105 fax

Hardware/Software
Two 486 PCs
Assorted audio/video
    equipment
Proprietary software

This project is a music-based immersive virtual reality entertainment experience.

Using virtual reality technology, the experience takes visitors on a train ride through an imaginative landscape. The simulated adventure begins aboard a photo-realistic steam locomotive. As they leave the station behind, passengers move downward through a tunnel of swirling mist and cruise among the shifting forms and intricate patterns they discover along the path.

But this is no ordinary VR experience. Fakespace's virtual locomotive is fueled by music. In fact, music drives nearly every aspect of the synthetic journey and generates the forms that occupy the landscape. Visual music techniques (orchestration as well as improvisation) generate an infinite number of unique immersive experiences.

Alexander Scriabin was the first composer to map color to his music. This led to the development of novelties such as color organs, simple forerunners of this project, which is the current culmination of Fakespace's use of music to create simulated reality. In the train adventure, abstract images become merged with realism. Virtual VU meters twist in kaleidoscope fashion as the music directly drives the visual images.

Traditional music videos will eventually pale in comparison to the excitement of participating directly with synaesthetic environments. When synaesthesia, the reintegration of the senses, is combined with interactivity, the result is a powerful experience of virtual imagery, playful exploration, and experimentation. This is more gratifying and far more memorable than passive viewing ever could be. It will eventually lead to virtual music parlors in entertainment centers.

Soundscapes Entertainment uses the powerful Onyx Reality Engine and Fakespace BOOM 3C, a high-resolution stereoscopic display, to present a rich, dynamic environment complemented with exquisite textures. The experience is created with Fakespace's proprietary software library running on top of Performer, which provides a fully immersive experience primed for intuitive exploration of the visual landscape. Soundscapes Entertainment can be configured for site-specific installations as individual stations or multiple-viewing stations. Multiple displays can function as repeat monitors of a master station, or they can be networked as multi-user stereoscopic entertainment kiosks.
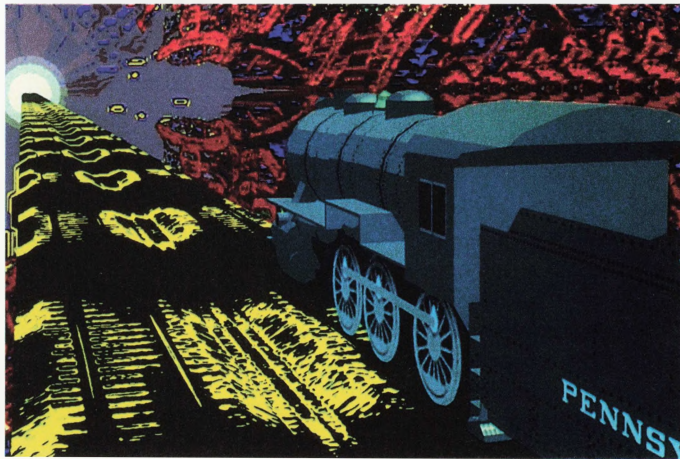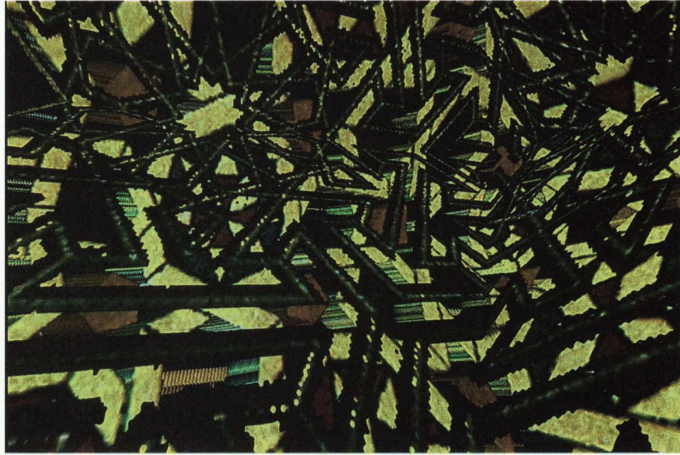
Fakespace, Inc.
Christian Greuel
4085 Campbell Avenue
Menlo Park, California 94025
USA
+1.415.462.5830
+1.415.688.1949 fax
xianatro@crl.com

Collaborators
Christian Greuel
Mark Bolas
Ian McDowall
Niko Bolas

Hardware/Software
Onyx Reality Engine
Fakespace BOOM 3C
   and headphones
IRIX 5.2
Performer
Fakespace Music Soundscape
   Library

In Chicago in 1990, Virtual World Entertainment (VWE) opened one of the first location-based entertainment virtual reality attractions in the world. It is still in operation today, along with about 25 other VWE sites on four continents. In these attractions, groups of eight people are entertained by "translocating" to other worlds that exist only in a computer.

The fourth generation of the medium is embodied in the Tesla cockpit. The image generator provides high-resolution, fully textured and lit, 30 Hz graphics. Fully spatialized audio is delivered through a 12-speaker array. Over 100 controls include buttons, joysticks, throttles, pedals, and keypads. Instrumentation systems such as radar and altitude indicators are displayed on six CRTs.

In the SIGGRAPH 95 installation, groups of four people are introduced to the theory and operation of the Tesla cockpit with a short film, interactive touch-screens, and verbal instructions. When they strap into the cockpit, they are "translocated" to another world, where they can explore and race through the canals of Mars. After their return, video recordings of the highlights of their mission are replayed and a printed log of activities is presented to each adventurer.

Background

The first VWE cockpits (ca 1989) featured 32 Mb of sprite-based graphics running on a proprietary enhancement of a 68000-based Commodore Amiga computer. Three-dimensionality was achieved by using a different sprite for each viewing of the 12 degrees of azimuth. Version II and III cockpits (ca 1991 and 1993, respectively) used a TI 34020 graphics processor for the main screen. The software renderer featured flat-shaded polygons with multiple moving light sources. An Amiga provided instrumentation displays and a 68020 performed game and network activities. Sound was provided by the Amiga in Versions I and II, and by a proprietary DSP board in Version III. Cockpits were networked via Arcnet at about 100K baud. In all of these versions, frame rate fluctuated from 5-12 frames per second.

At VWE's current sites, up to 32 cockpits are organized so groups of eight players can interact with each other in a 3D computer-generated environment. The VR experience is bracketed by mission briefings and reviews. At the outset of the adventure, the briefings include training films, information touchscreens, and scenario selection. After players emerge from the cockpits, the mission review station recaps the events for all to watch in a schematic replay on overhead monitors. "Pilots" are given computer-printed mission logs detailing their personal activi-

ties. In the summer of 1994, VWE introduced SiteLink, which uses ISDN modems to connect simulations at different sites around the U.S.

The Version IV Tesla cockpits, which opened in April 1995 at the original Chicago site represent an evolution from the previous flat-shaded, low-frame-rate worlds. Tesla cockpits feature four-channel, 3D audio, six instrumentation CRTs, and an infinity optic high-resolution, out-the-window 30 Hz display of fully textured, lighted, and z-buffered graphics.

At SIGGRAPH 95, each of the four Tesla-class cockpits is comprised of a Pentium class computer with a Division, Ltd. Pixel Planes V VPX graphics card set. The cockpits are networked via ethernet to an operators' console, which accepts entry of the scenario parameters and initiates the launch of a mission. A similarly configured graphics engine displays "news" coverage, action views, and instant replays of exceptional events for observers. Printouts of mission results are laserprinted during replays. A collection of multimedia touch-screen Macintosh machines provides background information and instructions to those waiting to experience the main attraction.

Basic Functionality

Once the cockpit's door is closed, extraneous light and sound are excluded. Inside, the cockpits provide the fundamental controls needed to navigate in the virtual environment. Locomotion is controlled by a throttle, and steering is accomplished with an aircraft-style joystick. The primary feedback to the pilot is the main out-the-window view.

Pilots are able to interact with each other directly (via intercom) or in the virtual environment. Examples of virtual interaction include combat, racing, leading, following, and cooperative exploration. Individuals can also explore on their own.

Two environments are available at SIGGRAPH 95. BattleTech places each participant in a 30-foot-tall walking tank ready for combat. In Red Planet, participants race through the industrialized canals of Mars in a hovercraft mining vehicle.

Virtual World Entertainment
Brenda Sexton
1100 West Cermak, Suite B404
Chicago, Illinois 60608 USA
+1.312.243.6515
+1.312.243.7818 fax

Hardware/Software
Pentium PC
Division VPX
Quad sound
100+ controls.
LBE BattleTech
LBE Red Planet
MUNGA

The Creative Worlds Institute (CWI), also known informally as the Toy Scouts, is a group of students who volunteer their time to study emerging digital technology. The institute is an ongoing project perpetuated by the students' drive to push new technologies to their limits.

CWI began in the summer of 1991, when a group of computer science students from the University of Central Florida (UCF) modified a Nintendo Power Glove and sent data to a Silicon Graphics workstation. The group quickly progressed to projects like the Infinite Walk and 3D Space Invaders. During this period, the group also developed hardware such as the VR Swivel Chair, an experiment in telepresence exploration. In the spring of 1992, CWI was invited to demonstrate its Virtual Campus Walkthrough of the UCF campus and its TEL-EREX (Tele Remote Operated Explorer), a Barbie car fitted with remote controls and a mini-camera.

Following its successful campus demonstration, CWI doubled in size, and the founding members began mentoring the new members of the group. The mentoring process, which involves teaching newcomers the various aspects of VR sound, graphics libraries, and hardware, keeps the group strong and active, and has led to the establishment of a high school branch of CWI.

In 1994, the Toy Scouts appeared for the first time at SIGGRAPH. The group showed a new type of immersive video game employing head-mounted displays, multiple six-dimensional trackers, and six-dimensional sound to immerse the player in a simulated reality. Using Silicon Graphics workstations, SGI Performer, World Toolkit, and custom software, the Scouts have pushed the level of immersion even higher, using texture maps to add more realism to the simulations and adding more track points on the body to generate a more realistic map of the players' movements. They have also networked the games to create a common environment that can be shared by competing players.

New Games

For SIGGRAPH 95, CWI has produced four games:

- JitalWast, a multiple-player shoot-out featuring the use of data gloves for player input.

- SyberKnight, a more realistic look at simulation training, which features highly detailed and articulated models. The player controls one of the models against another player.

- Burning Blades, a sword combat program that emphasizes the fluidity of the players' model and motion.

- Death Maze, a capture-the-flag-type game set in a maze where players encounter each other as computer-generated players.

Gesture recognition controls the highly articulated player models through six trackers located at key points on each player's body.

All of these games feature the Scouts' unique six-dimensional sound interface and immerse players through seamless interfaces.

Basic Functionalities

Auratron is a six-dimensional sound system that allows the game to spatially locate sounds. It is a non-CPU-intensive system on a PC serially linked to the main system. The PC calculates all of the volume intensities required on each speaker and then plays them.

While implementation of the network varies from game to game the overall concept is the same, to allow players to interact with the simulation environment and each other. CWI has found that these games are much more entertaining when played against another human player.

Serial sensors, such as the Polhemus Fastrak or Ascension Flock of Birds, are essential for tracking the motion of the players. All of the games use custom serial drivers for interfacing with a particular sensor. These drivers provide an interface that allows CWI to deal with calibration and response issues required for real-time interaction.

Data gloves help provide an intuitive interface for use inside the VR worlds. Without the Data gloves, the VR worlds would have to be manipulated with more traditional devices such as joysticks.

Potential Future Impact

The application of full-body motion, which provides a quick and intuitive interface, combined with the heightened reality of spatially located sound is relatively new to real-time simulation and VR environments. With this combination, throwing, ducking, grabbing, and spinning become common motions inside the VR environment, and spatially located sounds bring VR closer to imitating the real world. When the applications are networked together, the VR environment becomes a shared space that can be manipulated by multiple users.

The techniques developed by CWI have many commercial applications. The routines developed for full-body motion tracking can be used for better data acquisition. The calibration required for games can be used to promote data visualization and manipulation. Combining the calibration techniques along with the ability to network multiple users into the environment means that data can now be viewed and manipulated graphically by several people in a more intuitive manner.

Creative Worlds Institute
David McLaurin
3280 Progress Drive
Orlando, Florida 32826 USA
+1.407.249.4704
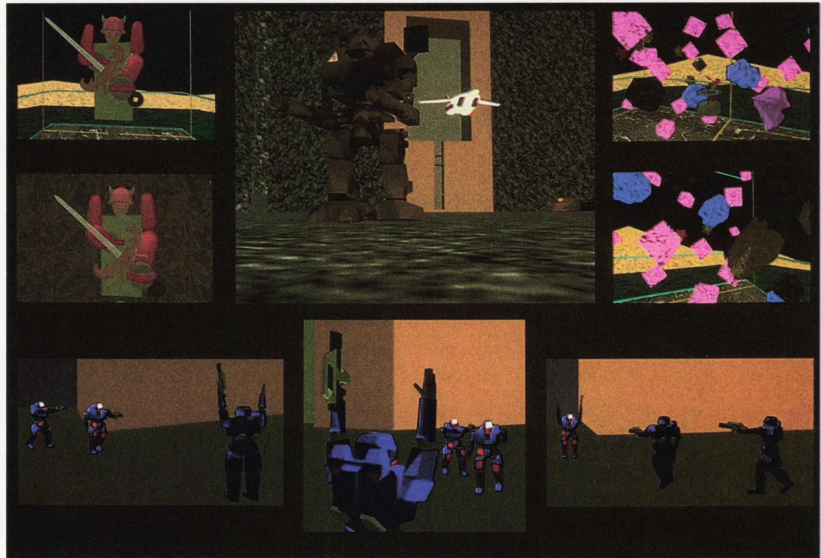+1.406.658.5059 fax
mclaurin@vsl.ist.ucf.edu

Authors
David McLaurin
Shawn Kendall
Tom Miller
Joel Davis

Collaborator
Institute for Simulation and
Training, University of Central
Florida

Hardware/Software
Two Silicon Graphics Onyxs
    with MCO option
Ascension Flock of Birds
Performer 1.2
World Toolkit 2.0
Custom software

The power of illusion is immense. Sit any group in front of a big screen and show them a point-of-view film – say, from a racing car – and very rapidly they become disoriented. They actually start leaning with the g-forces or bracing themselves for braking and acceleration. Add real motion cues, which correlate exactly with the visual input, and the brain and body are both quite easily fooled. The illusion, in fact, is complete: viewers feel like they are actually riding the vehicle.

The techniques and technologies behind these illusions have been proven. Experienced airline pilots, for example, can imagine that a flight simulator fixed to the ground is a real aircraft flying through the air. This approach is also at the heart of many of the world's most successful entertainment attractions. It allows the public to experience thrills, excitement, and fantasy rides they could only dream of in the real world.

Venturer S-2 is a safe and flexible entertainment attraction that takes up to 14 people on a thrill or fantasy ride of a lifetime. It integrates acceleration and g-forces to form a high-performance three-axis motion system with a point-of-view image displayed on a big screen and enhanced by CD-quality sound. The system is backed by an extensive library of software, all produced to full broadcast video standards and displayed using the latest CRV laser-disc technology.
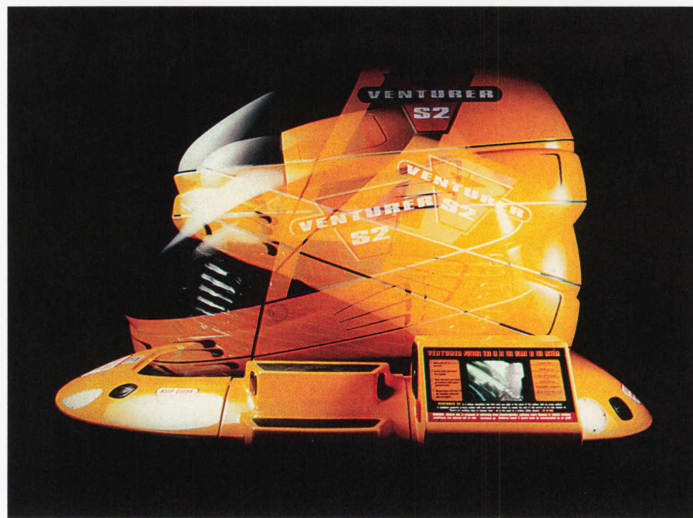
Thomson Entertainment Systems
Antonio Cruz Jr.
4900 Hopyard Road, Suite 100
Pleasanton, California 94588 USA
+1.510.736.5144
+1.510.736.5145 fax

YORB is an ongoing experiment in building an interactive virtual community. Viewers can reach YORB from their phone, computer, or television set. They can simply watch the neighborhood as it is displayed on cable, or they can participate by telephone. Up to four phone callers can be talking to each other live at the same time. One of these callers is designated as the pilot, who controls the journey through YORB by pushing touch-tone buttons on the phone.

Subscribers to Echo, a New York-based computer conferencing service, can also participate in YORB. When they enter the Echo chat area, everything they type appears live on the YORB TV screen. Sometimes they engage in conversations with the phone callers.

After they enter YORB, phone and computer participants can play music, games, or other cooperative activities. In Ritual Ground Zero, each participant controls nine different musical samples from the phone. In Daliwood, participants cooperate in unusual game activities. In the YorBar, participants can make cartoon characters "dance" to tunes they have selected. Viewers can also contribute to the virtual community by uploading graphics, sounds, or digital movies to the bulletin board system.

YORB uses off-the-shelf 3D and presentation software on the Macintosh to display a world model that is flexible, expand-able, and easy for the average TV viewer to understand. The neighborhood is broadcast over normal cable TV lines, and a standard touch-tone phone serves as the set-top box. YORB's purpose is to help viewers feel that they can easily navigate and contribute to a virtual community in cyberspace.

New York University

Nick West
Interactive Telecommunications Program
721 Broadway, 4th Floor
New York, New York 10003 USA
+1.212.998.1894
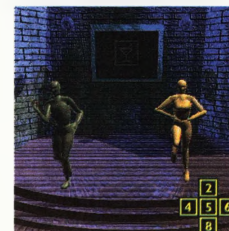+1.212.998.1898 fax
west@echonyc.com

Author

Nick West

Collaborators

Students in NYU's Interactive Telecommunications Program

Hardware/Software

Macintosh Quadra
Full-screen Quicktime card
Touch-tone encoder
Two multimedia speakers
Macromedia Director
Strata Studio Pro
Touch-tone telephones

The XBAND Video Game Network is the only multi-player video game modem and network that allows 16-bit cartridge game players to play their favorite video games against other opponents in real time over a telephone line. When it went online in November 1994, the network supported the Sega Genesis platform. Now, it also supports Super Nintendo. Unlike other networked game devices, XBAND is designed to support all of today's popular multi-player video games without modification.

XBAND, created by Catapult Entertainment, links together video games from around the U.S. Participants' equipment requirements are simple: a Sega or Super Nintendo and a telephone line. They connect to the network via a modem that plugs into the cartridge slot, and then the cartridge plugs into the modem. The modem is "intelligent." It incorporates a chip that modifies execution of a game cartridge to make existing games that were never intended to be played over distributed systems work through the modem. The modem also includes a ROM-based operating system with a simple user interface, mini-email (with Internet access) for kids, and two online newspapers that are downloaded every time you connect.

To use XBAND, the participant simply instructs the modem to connect to Catapult's server, and Catapult finds another opponent of the same skill level somewhere in the U.S. who wants to play the same game at the same time. Then the server directs one of the modems to call the other. Of course, most parents sign up their kids for local calls only, but all users can receive long-distance calls so from time to time even local-only modem users get to play someone far away.

When players connect to the XBAND Network, they receive game playing tips, personal statistics, ranking information, and updates on other players and competitions organized through the network. The network matches players to an available competitor of equal skill level or a competitor of their choosing. Players are identified by a unique icon and "handle" to protect their privacy and anonymity.

Players also have the ability to send and receive messages through the network's XMAIL system and XBAND's online newspaper, bandwidth, which provides the latest updates on the video-game scene and other entertainment and sports news.

Parents can set controls on the number of hours or times of day their children can play on the network, and they can establish long-distance calling restrictions. Parental controls can be updated any time. All access connections to the XBAND Network are local calls unless long-distance playing has been specified by a player and/or parent.

XBAND communication latency is low enough (<50 milliseconds) that the response delay in even a coast-to-coast video game is barely perceptible by an expert human game player (New York to Los Angeles latency is about 35 milliseconds through copper or fiber optics). For comparison, Internet latency ranges from 200 milliseconds to more than one second, so Internet games such as NetTrek need to allow for arbitrary delays. Online services connect through x.25 packet-data networks that have latencies between 250 milliseconds and 1.5 seconds.

Catapult Entertainment, Inc.
Melissa Miller
20823 Stevens Creek Boulevard
Suite 300
Cupertino, California 95014 USA
+1.408.366.1735 x 269
+1.408.366.1729 fax

Hardware/Software
Sega Genesis or Super
   Nintendo
Direct-dial phone line
XBAND Modem
Television monitor
16-bit video games
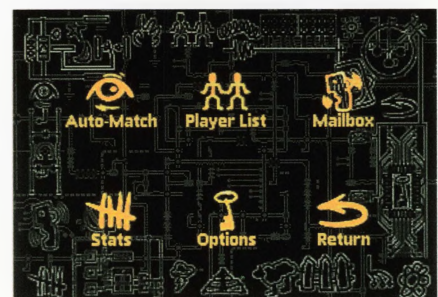
This Virtual Reality Entertainment Corporation (VRE) project is a location-based entertainment environment consisting of four stand-up pods networked for interactive real-time play. The relatively inexpensive PC hardware combined with proprietary software provides a reasonabl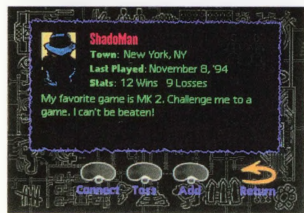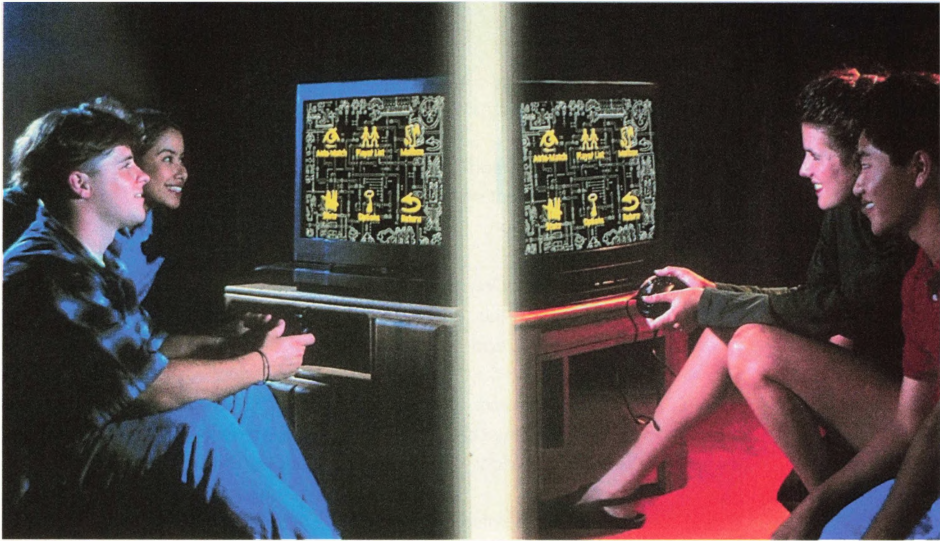e approach for entering the location-based virtual reality entertainment market. The software for the installation is Xenomorph, a multiplayer, fully immersive, virtual reality game experience that transports the player to a high-tech, futuristic scientific research complex on Mars. The task: save both the facility and its desperate crew from invading alien creatures. Unlike the standard adversarial approach to multiplayer games, Xenomorph offers a cooperative experience.

Xenomorph began in the spring of 1994 with an effort to produce a relatively inexpensive alternative for high-quality multiplayer virtual reality entertainment. VRE recruited developers with diverse backgrounds (engineering, computer science, game design, graphic design, sound engineering, and architecture) to create a comprehensive approach to the overall design of both hardware and software components. Some of the design principles applied to Xenomorph were borrowed from VRE's previous experience with fully immersive virtual reality game design for the arcade market.

The software was designed in an object-oriented fashion so the company could quickly design and produce another product by creating new graphics and audio data with minimal software changes. The design methodology treated all components of the game as objects maintained by a state machine process.

The hardware consists of a Pentium PC with add-on boards for peripheral input and graphics/audio output, a head-mounted display, and a floating joystick for player interaction, all residing in a custom-designed interaction pod. Only the head-mounted display, the joystick, and a debit-card reader are visible to the player. A custom-designed sound system is also incorporated into the pod for multi-player communication.

Graphical data were generated using various packages such as Autodesk's 3D Studio, Animator Pro, and Adobe Photoshop. Sound data were produced using Ensonic keyboard equipment in conjunction with various wave editors and audio samples from CD libraries and live recordings of voice-over professionals.

A Division VPX graphics card generates the 3D environment and a Creative Labs AWE32 sound card produces 3D sound and voice effects. A Polhemus InsideTrak follows the player's head and floating joystick movement. In the game, the joystick is represented as an extension of the player's hand holding a weapon. A Visionetics Genlock card produces various overlay graphics necessary for game play (map displays, scoring information, playing of animations, etc.). For multi-player interaction, a standard network card is used in conjunction with custom software to transfer locations and actions of the players and other objects to the other pods.

Virtual reality entertainment systems are the future of video games. With the never-ending increase in graphics quality and realistic effects in existing video games, the next logical step is to give the player the full experience of interacting in a computer-generated world. Unlike the dedicated video game of today, a virtual reality system can be upgraded with new software whenever it becomes available, which allows players to choose from a library of experiences.

Virtual Reality Entertainment Corp.
Brad Gianulis
414 Baxter Avenue., Suite 230
Louisville, Kentucky 40204 USA
+1.502.585.4246
+1.502.585.5784 fax
vree@thepoint.com

Authors
Brad Gianulis
Michael Price
Ed Folz

Collaborators
Tom Roe
Todd Fluhr
Kevin Capito
Lauren Logan

Hardware/Software
PC and proprietary hardware
Proprietary software

This interactive movie engine, developed by Evolutionary Publishing, made its first appearance in the spring of 1995 with Sony Imagesoft and Propaganda Code's "Johnny Mnemonic" CD-ROM. CineACTIVE is notable for its transparent interface, which eliminates graphics from the screen to create a seamless cinematic experience. Developers Peter Marx, Michael R. Abato, and Philippe Goodman give live demonstrations of the engine as it was used for "Johnny Mnemonic." They also discuss new projects and answer questions about the technology's potential applications.

Evolutionary Publishing
Peter Marx
1453 Third Street
Santa Monica, California 90401
USA
+1.310.260.0058
+1.310.260.0068 fax
pmarx@netcom.com

The latest product from the designers of "Peter Gabriel's Xplora I," the award-winning music CD-ROM. Steve Nelson and Frank Dutro of Brilliant Media present their new interactive marketing system, a flexible tool that helps publishers, distributors and marketing managers review, evaluate, plan and implement marketing and distribution strategies for films, music, print, and multimedia products.

Brilliant Media
Frank Dutro, Steve Nelson
450 Pacific Avenue, Suite 100
San Francisco, California 94133
USA
+1.415.434.5040
+1.415.777.2379 fax
S.Nelson@applelink

AVRe is a sophisticated sound-rendering technology that allows sound to be experienced as a spatial environment. mTropolis is a highly visual, object-oriented authoring environment that enables modular design of interactive experiences. These two tools are designed to complement each other so that sounds produced and manipulated in AVRe can be seamlessly integrated into mTropolis' multimedia applications. AVRe developer Thomas Dolby of Headspace and mFactory President Hamish Forsythe demonstrate this unique method for integrating visuals and sound, and answer developers' technical and creative questions about its possible applications in their own projects.

Headspace
Thomas Dolby

mTropolis
Hamish Forsythe
1440 Chapin Avenue, Suite 200
San Francisco, California USA
+1.415.548.0600
+1.415.548.9249 fax
hamish@mfactory.co

interactive communities

Coco Conn, Rob Hennigar, and Andy Goodrich
Co-Chairs

Interactive Communities

At SIGGRAPH 95, Interactive Communities explores how groups of people are using computer graphics, interactive media, and network communications to build new types of communities and engage in new forms of social interaction. The venue establishes the ambiance of a broadcast production facility crossed with an air traffic control tower. In a bustling environment of large-screen projections and new media technologies, Interactive Communities serves as the nexus for network-wide communication, linking remote participants around the world with SIGGRAPH 95 attendees.

INTERACTIVE COMMUNITIES JURY

Brian Blau
Autodesk, Inc.

Jim Costigan

Clark Dodsworth
Fujitsu Cultural Technologies

Enrique Godreau
Adobe Systems Incorporated

Jeff Mayer
SprickMayer&Company

Ken Yapkowitz
AND Interactive Communications

INTERACTIVE COMMUNITIES COMMITTEE

Jim Costigan

Curt Kass
Sax Arts & Crafts

Jeff Mayer
SprickMayer&Company

Celia Pearce

Jim Thompson
Tadpole Technology

Zane Vella
Internet Tours

Ken Yapkowitz
AND Interactive Communications

CONTACT
Coco Conn

SIGGRAPH 95 Interactive Communities Co-Chair
Digital Circus Productions
2207 Willetta Avenue
Los Angeles, California 90068
USA
+1.213.962.1662
+1.213.962.8916 fax
coco@siggraph.org

ALIVE DREAMS AND ILLUSIONS

In these shared spaces of reflected dreams, users see mirrored images of themselves and, along with other people and agents, manipulate the state of the world and its agents to affect or guide the illusory experience. Using an environment for immersive virtual experience based on computer vision techniques (ALIVE, SIGGRAPH 93), a "magic mirror" display is provided by compositing a reflection of users onto the graphics display and projecting the result on a large screen. Interaction between people and agents is via natural hand and arm gestures, without the use of goggles or gloves.

Remote users can act as "directors" and manipulate the behavior of agents and/or the state of the virtual world using high-level commands. For example, a virtual dog called Silas interacts with users through a variety of gestures. When you throw him a virtual ball, he chases after it and

brings it back. Silas' behavior is determined in part by the actions of the user and in part by his internal motivational state. He is more likely to play if his "desire to play" is high and his "level of fear" is low.

While Silas does a fine job as an autonomous dog, he may not be interacting with a user in the ALIVE space in the desired way. To address this problem, a second user can control Silas and have him interact with the other human user. The "director" may manipulate the behavior of Silas (or any of the creatures) by modifying the levels of relevant motivational variables (hunger, fear, desire to play, etc.), by directing him to perform certain tasks, or by modifying sensory input (for example, cause the dog to "hallucinate" that the user is really a juicy steak). The resulting behavior combines the complex interplay of the director's input, the internal state of the creatures, and the user's actions.

Multiple users also directly interact via their images and recognized gestures on the ALIVE "magic mirror." This interaction can occur with multiple users at the same site or between remote sites. Body forms and appearances are changed and exchanged as users' images are subjected to various forms of distortion and texture manipulation. Virtual creatures, or the remote director, direct the images in response to the user's actions, for example grabbing and distorting parts of a user.

This installation showcases new extensions of the ALIVE system that facilitate interaction and collaboration among multiple network users and display of distorted/illusory user representations. The demonstrations share a common theme: collaboration and interaction of multiple users via the core technologies of the ALIVE environment, the magic mirror and the behavior-based agent model. By integrating state-of-

the-art video i/o, computer vision, and computer graphics with behavior-based modeling of active creatures, new forms of social interaction across time and space can be explored.

Trevor Darrell
Bruce Blumberg
Sharon Daniel
Brad Rhodes
Pattie Maes
Alex P. Pentland
MIT Media Lab
20 Ames Street, E15-305
Cambridge, Massachusetts 02139
USA
trevor/bruce/sdaniel/rhodes/
pattie/sandy@media.mit.edu

Navigating is more than finding a convenient place to park or identifying the shortest line in the supermarket. Likewise in cyberspace, navigating is more than a convenient place to login and read your favorite newsgroup. Where information space is concerned, "navigating" may be considered a search for meaningful relations among information and the states of actively evolving systems.

Audio plays an important role in many kinds of navigation. When we take a walk in our analog world, we see and hear our surroundings. We may not realize that we are actively listening until an unusual sound grabs our attention or someone calls our name, or we hear a sound that reminds us of that old car Uncle Milt used to drive. Memorable sounds make our world meaningful and help us to find our way between the external world, our memories, and our perception of the present. New sounds can help us describe and understand new things.

For SIGGRAPH 95, NCSA's Audio Development Group provides sound synthesis software and expertise to create auditory signatures that identify sites on the Interactive Communities network. An auditory signature is a symbolic, interactive mini-scenario in sound, descriptive of the content and activity on a network node.

For cyberspace travel, the project provides a large-screen interactive graphic representation accompanied by 3D sound. SIGGRAPH attendees can "walk around" a visualization of Interactive Communities and hear sonic representations of activities at nodes and neighborhoods.

Participating projects send data on their content and activities over the local network to the navigation site. Sound-synthesis algorithms use the data to create auditory signals. Sounds are created in software and rendered in real time using the NCSA Sound Server, a unique sound-synthesis software environment. The behavior of the sounds tells the story of what is going on at one or more exhibits as visitors "walk" past them in cyberspace. The audio ambiance changes as visitors move from neighborhood to neighborhood, reflecting the characteristic differences of the exhibits in each area.

This project is designed to:

- Bring the cyberspace and computer graphics communities a few steps closer to using interactive sound.

- Encourage visual artists and designers to include sound composition early in the design process, while basic functionalities are still under construction.

- Expedite development of mainstream desktop computers that include audio as well as graphical rendering engines.

Robin Bargar
Audio Development
Virtual Environment Group
National Center for
Supercomputing Applications
University of Illinois at Urbana-
Champaign
+1.217.244.4692
+1.217.244.2909 fax
rbargar@ncsa.uiuc.edu

Contributors
Insook Choi
Camille Goudeseune
Kelly Fita
Bryan Holloway
Ulrike Axen
Carlos Ricci
National Center for
Supercomputing Applications
University of Illinois at Urbana-
Champaign
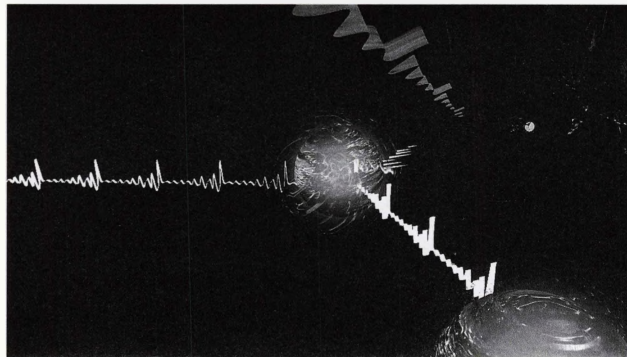
Better Face Communication presents visualization of a virtual face-to-face communication environment. A synthesized face is displayed with several kinds of expression, which echo words spoken in real time. The virtual face is natural and can be updated according to the participant's image. Lip motion is also synchronized with the participant's voice. Participants can converse with themselves or others in this environment.

In the model-making process, the image and training voice are recorded by camera and microphone. After adjustment for the feature positions along the outline of each programmed item on the face, a personal generic model is constructed, and texture is captured from the front image of the participant. At the same time, the participant can speak a few vowels into a microphone for the voice-training session.

In the voice analysis process, spectrum features are calculated frame by frame from the voice input. These parameters are applied to the input layer units of a neural network. Image feature parameters are obtained at the output layer units at 30 cycles per second. Mouth shape and jaw position are deformed by these parameters in this "media conversion" process.

In the image synthesis process, the 3D model is modified by several parameters related to facial expression and lip motion, and texture mapping is performed to display the synthesized face image. A 4000-polygon model can be synthesized faster than 30 frames per second by the Onyx Reality Engine2. Except for the mouth shape and jaw position, facial expression is applied manually. Image synthesis and voice analysis are performed synchronously through ethernet.

In the demonstration, communication and collaboration between the virtual operator and the participant control facial expressions. After a few minutes of training, the participant learns how to control facial expressions and lip movement with a pointing device and voice input.

Shigeo Morishima
Department of Computer Science
University of Toronto
6 King's College Road
D.L. Platt Building, Room 265D
Toronto, Ontario M5S 1A4
Canada
+1.416.978.7497
+1.416.978.1455 fax
shigeo@ee.seikei.ac.jp

Contributors
Shigeo Morishima
University of Toronto

Shoichiro Iwasawa
Tatsumi Sakaguchi
Fumio Kawakami
Makoto Ando
Seikei University
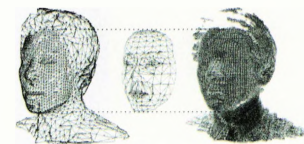
Technology is becoming a vital factor in American society. Concepts such as virtual reality and the Internet have begun to infiltrate popular culture. At Computer Science House (CSH), the fusion of technological resources and college lifestyle exemplifies today's worldwide information revolution.

CSH is a student organization at the Rochester Institute of Technology, a unique living environment that combines personal and professional lifestyles. It is a community surrounded by technology, a place for learning, discovering, and productivity. Unification of the college lifestyle and high-tech equipment creates an interesting environment and some unique projects. This exhibit showcases some of those projects and provides information about the innovative CSH lifestyle.

Eric Van Hensbergen

Computer Science House
861 Grace Watson Hall
Rochester, New York 14623 USA
+1.716.475.3305
cshouse@mail.chs.rit.edu

Collaborators

Faculty, staff, students
Computer Science House
Rochester Institute of
Technology
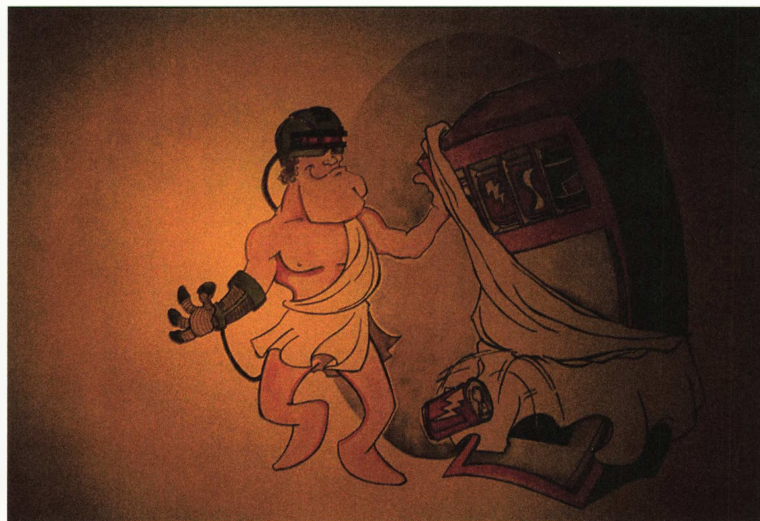
In this CD-ROM and World Wide Web virtual support group, newly diagnosed women explore medical information and survivors' personal stories about breast cancer and treatment options.

Breast Cancer Lighthouse was developed to convey a strong feminine, calming, and friendly tone. The lighthouse metaphor (a beacon to guide you...) is located on an island. The interior of the island has a garden path, with wooden signs offering different menu options for diagnosis, treatment, and recovery information. The user can also choose to go for a "walk on the beach," with women who tell their personal stories about surviving breast cancer.

Is CD-ROM Dead Yet? (You Tell Us...)

These days, developing a cross-platform title means creating a CD-ROM and a World Wide Web version. The Michigan State University Communication Technology Laboratory is exhibiting two cross-platform projects, with CD-ROM and Web versions side by side: The Digital Learning Center for Microbial Ecology (DLCME) (see page 10) and Breast Cancer Lighthouse. What do we lose if we skip the CD-ROM version?

Even with ethernet connections, the Internet requires download time to retrieve each audio and digital video chunk. The aesthetic quality of the interactivity is diminished compared to CD-ROM. On the other hand, the content can be continuously updated, and it is accessible worldwide on various platforms. Interpersonal communication is possible – in the Lighthouse, with medical professionals and other survivors of breast cancer, and in DLCME, among scientists, teachers, and students.

Internet users, especially those limited to dial-up access, will likely get frustrated and avoid much of the audio and digital video content. And they may leave the program to search the Web, never to return.

Accessibility also affects the experience. Viewing conditions at home are comfortable and private. Placing CD-ROM hardware in a health care clinic could provide access for all the clinic's patients, regardless of their access to computers. But it will limit how often and by whom the content is accessed.

Teachers control access to the computer at school. When kids explore the Microbe Zoo in the DLCME, directed activities by the teacher and the presence of other kids may enhance the experience. On the other hand, it will be limited by classroom time constraints. Or kids can explore on their own or with friends from home. Which format – World Wide Web or CD-ROM – yields more learning, more exploring?

Most high-speed Internet connections are available at work or school, rather than in the home. Thus, cancer content would be accessed after hours and not always in a private situation. For that reason as well, text and pictures will be more often accessed than sound and movies. Does the program loose its impact without sound and video? Will users of the two media spend different amounts of time with personal stories versus medical facts?

For now, because these two delivery media have different technological affordances, both working together will likely afford the richest interactive experiences.

Darcy Drew Greene
Carrie Heeter
The Communication Technology Laboratory
Michigan State University
253 Communication Arts
East Lansing, Michigan 48824
USA
+1.517.353.5497
+1.517.353.5498 fax
Greene@msu.edu
Heeter@msu.edu

Contributors

Darcy Drew Greene
Carrie Heeter
Matt MacQueen
Pericles Gomes
Susanna Tellschow
Barbara Sparks
Doak Bloss
Ricardo Freire
Fabio Pasqualetti
Bob Matson
Flavia Duarte
Andrew Dickson
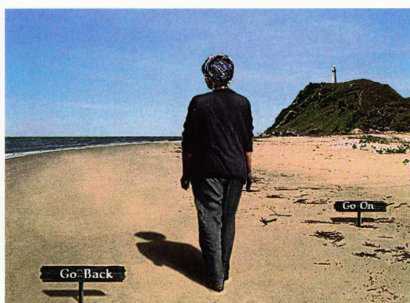
We are constantly surrounded by and immersed within a dynamic ecosystem that is normally invisible to us and therefore outside of our awareness. Most people know of microbes only as disease-causing germs, but the microbial world is also teeming with beneficial creatures such as the yeasts that make bread rise, the lactobacillus that creates yogurt, and the host of organisms that turn old leaves and dead logs into new soil.

The mission of the Digital Learning Center for Microbial Ecology is to use multimedia and networking technologies to bring the invisible worlds of microscopic organisms and communities into view and to make them accessible to students and teachers everywhere. The project is being created by the Michigan State University Communication Technology Laboratory in collaboration with MSU's Center for Microbial Ecology (CME) and College of Education with partial funding from the National Science Foundation.

CME, one of 19 NSF-funded Science and Technology Centers dedicated to interdisciplinary study of emerging scientific fields, serves as a gathering place for ecologists, biochemists, and microbiologists interested in microscopic ecosystems.

The Digital Learning Center for Microbial Ecology is an extension of this worldwide virtual community, where teachers and students collaborate with colleagues, conduct seminars, and share their findings in a continuous dialog on microbial ecology. It includes three environments:

- Microbe Zoo, in which users stroll from "cage" to "cage" ogling at the exotic and peculiar specimens housed within.

- Microbes in the News, a compendium of topical items from popular press stories relevant to microbiology, where students ask questions and scientists offer comments in a network-based dialog on the latest

news from the world of microbiology.

- Meet the Scientists, where scientists describe their work and explain the origins of their interest in science.

The environments are available on CD-ROM and via the World Wide Web. They include: photos of microorganisms, laboratory environments, and scientists; digital video of researchers discussing their work, animations illustrating biochemical processes, and views through the microscope showing peculiar forms of microbe locomotion; and audio clips of enthusiastic scientists describing what turned them on to science. News summaries are posted to the Microbes in the News section of the World Wide Web site as the stories break, and students and scientists comment on the stories and post questions via email. Users can browse multimedia resources online or download stand-alone modules.

Randy Russell
Carrie Heeter
The Communication Technology Laboratory
Michigan State University
253 Communication Arts
East Lansing, Michigan 48824 USA
+1.517.353.5497
+1.517.353.5498 fax
21602rmr@msu.edu
commtech@msu.edu

Contributors

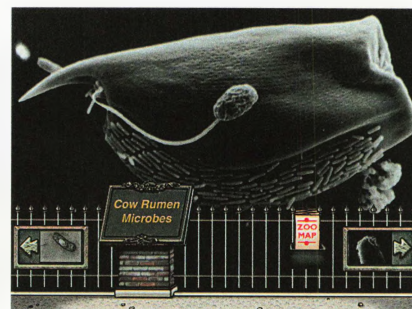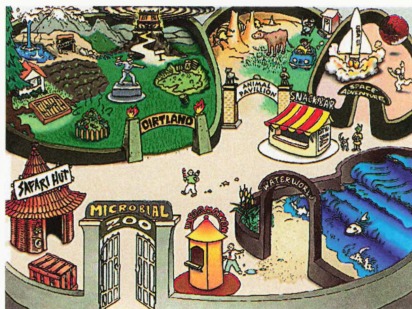*Senior Programmer/ Designer*
Randy Russell

Microbial Ecology Science Content Expert
Catherine McGowan

Executive Producer
Carrie Heeter

Design and Programming
Bob Matson

Artist
Susanna Tellschow

Brian Corrs
Ed Zelinske
Ricardo Freire
Andrew Dickson
Flavia Duarte
Pericles Gomes
Tim Mallos

With the Electronic Postcard, anyone can send a digital postcard to anyone else in the world who has an email address and access to the World Wide Web. As in the real world, you choose a card from a variety of images, write your message, and send it off. These postcards, however, are electronic. No physical card is sent. The image and the message are kept online. Because the Electronic Postcard is part of the World Wide Web, the message contents can be hypertext: images and sounds can be part of the message, and there can be links to any other data in the Web.

Since there is no mechanism within the Web for reading mail, the postcard is not sent directly to the recipient. Instead, the recipient receives a notice that a postcard is waiting at the Postcard Office. The notice includes the Web address for the Postcard Office and the recipient's claim number. At SIGGRAPH 95, a special branch Postcard Office features images from the Art Gallery and the technical programs.

The World Wide Web is potentially an excellent environment for online communities. It contains a wealth of information on a huge number of topics, ranging from the most esoteric of artistic and scientific endeavors, to the most mundane of product advertisements. It includes electronic facades of big corporations and sometimes surprisingly candid self-portraits of thousands of individuals. Yet it is not possible to communicate with others in this environment; each Web explorer wanders alone.

The Electronic Postcard provides a way to use the World Wide Web for interpersonal communication. With the ability to intersperse links to other sites in the text of the message, one can not only supply pointers to useful information, but also develop a new vocabulary of asides, puns, and references.

http://postcards.www.media. mit.edu/postcards/

Judith S. Donath
MIT Media Lab
judith@media.mit.edu
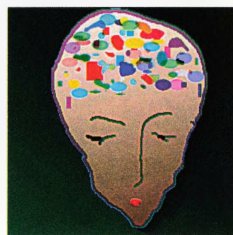
n a head-mounted display, you find yourself on a rock ledge above a distant plain, under a green and yellow sky – on another world. Strange lightning flashes in the distance. In front of you lie two five-limbed creatures crackling with electrical energy. If you examine one closely for more than a few seconds, the unobserved creature begins to move, to reach its five limbs toward you – like an alien game of "Redlight-Greenlight." When one of the two creatures finally catches you in its limbs, you hear a voice welcoming you to the planet. As the top of the creature's body opens and blooms, the secret structures within are revealed.

At this point, the world switches to animation, and you are overwhelmed by direct beams from this very intelligent creature's brain. Light, sound, color, memories play all around you, welcoming you into the creature's society – its space. You can see the creature's inner world at work as it "talks" to you. The animation consists of various scenes of its culture and past. What seemed at first to be a terrifying nightmare becomes communication between two worlds.

Significance

As we can observe in the extreme popularity of captivating games like DOOM, or commercial virtual reality arcade applications, aliens are usually for killing. The different, the unusual, the inhuman, is to be feared, evaded, and slain. "If it moves, kill it!" is the lesson of games such as DOOM, an inappropriate philosophy in our increasingly interconnected world. Through interactive technologies, this project illustrates that all is not as it first appears, and sometimes a stranger is a friend.

Amatul H. Hannan
ToolBox Productions
77 Creeley Road
Belmont, Massachusetts 02178 USA
+1.617.489.0197
ahannan@alumni.cs.umb.edu

Ronald R. Mourant
Professor and Director
Virtual Environments Laboratory
330 Snell Engineering Center
Northeastern University
Boston, Massachusetts 02115 USA
+1.617.373.3931
+1.617.373.2501 fax
mourant@meceng.coe.neu.edu

Collaborators

Programmers
Oren H. Levine
Northeastern University

Eric Pierce
Dynamic Automated Systems

Chris Sepulveda
Harvard University

3D Modeling – World Modelers
Dennis Lee
Verideth Keller
ATECH Inc

Animation
Geoff Kornfeld
Yoyodine

Creature Models
Gerard Fanning
ARTOFFICIAL

Consultation
Ann Powers
Eben Gay
Brenden Maher
BCSVRG

Frontiers of Utopia is the final part of a trilogy exploring the history and nature of idealism, technology, and design. By touching icons and objects in the virtual space, viewers become time travelers and move interactively through four time-zone layers representing the Frontiers of Utopia of the 20th century.

During their explorations, viewers interact with eight different women and learn more about their private lives by asking them questions and examining personal objects in their suitcases. In the center of the space, viewers can attend a virtual dinner party and choose women from different eras to converse with each other and make comparisons. The life experiences and social, racial, and historical backgrounds of the women offer viewers a rich tapestry of ideas, attitudes, locations, and historical perspectives.

The first two projects of this trilogy, Machinedreams (1991) and Paradise Tossed (1993), explored in a stylized and dreamy manner the relationship between desire and production of our domestic environment. In both works, viewers were encouraged to construct a montage of sounds and animated images from 1900, 1930, 1960, and 1990. As they explored various spaces, viewers' movements triggered sounds, or they used icons on a touch-sensitive screen to trigger animation sequences. In this way, they became time travelers who encountered interesting associations and learned about history.

Frontiers of Utopia examines our notions of the ideal society (utopia) by comparing different historical concepts and political attitudes. It also addresses women's relationships and their attitudes toward media and technology.

Jill Scott

Monitor Info System/ZKM
ZKM Medienmuseum
Postfach 6919
D-76049 Karlsruhe, Germany
+49.721.9340.420
+49.721.9340.59 fax
jscott@hermes.ZKM.de

Contributors

Direction and Concept
Jill Scott

Production
The Australian Film Commission
Monitor Information Systems

Support
ZKM Medienmuseum

Programming
Jens Muller and Monitor Information Systems

The Dinner Party Menu
Frontiers of Utopia, 1995 ...

HotWired is new thinking for a new medium. Since its launch in October 1994, it has changed the face of publishing in the online world. Its originality in graphics, content, and point of view make it utterly different from any other online service.

HotWired is published on the World Wide Web. Its audience can connect from anywhere in the world. Membership is free, and a registration system allows HotWired users to customize their view of the station. Hypertext links give HotWired members a gateway into the expanding universe of the Web, and links from other Web pages bring new members onto HotWired.

Since October 1994, HotWired has been adding about 1,000 users each day. In mid-April, membership topped 150,000. HotWired launched with six channels:

Signal is the pulse of the digital revolution, including news about where to go and what to see on the Net, industry gossip, and reviews of advances in communications technology.

Eyewitness offers highly personal hypertext essays and bulletins, plus calendars, current events, and news from Tokyo, London, Amsterdam, Johannesburg, and other cities around the world.

Renaissance 2.0 includes HotWired's digital galleries, where a new generation of musicians, illustrators, fine artists, filmmakers, and writers show their work.

Piazza is the heart of HotWired, a central square where members can exchange information, criticism, fan mail, and business tips; the community space uses custom technology to create a graphical conferencing system for the Web. In HotWired's auditorium, members chat with a regular schedule of live guests.

Coin is where commerce takes place on HotWired. In the classified section, members can buy, sell, and trade goods. They can also find videos, CD-ROMS, and other

original work by members of the HotWired community. HotWired also contains the archives of Wired magazine. This is a free, searchable, full-text library of every story that has appeared in Wired.

HotWired broke the mold of online programming by eschewing "shovelware" and building a creative team of engineers, editors, and designers that produces original online material on a daily deadline. (It also sold out all its advertising spaces at launch!)

http://www.hotwired.com/

HotWired
520 Third Street
San Francisco, California
94107 USA
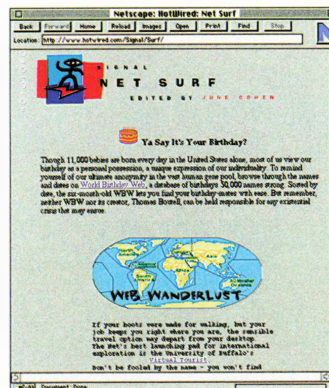
This Interactive Communities exhibit gives participants an opportunity to learn how researchers, policy analysts, educators, decision-makers, and students use an umbrella of computer graphics and scientific computing techniques to examine environmental concerns. Four research groups and one educational program present real-time demonstrations of the latest visualization and decision support tools for environmental and earth sciences exploration:

- Khoral Research Inc. demonstrates a complete application development system that redefines the software engineering process to include all members of the work group, from application end-users to infrastructure/visualization programmers.

- The Sequoia 2000 Project, San Diego Supercomputer Center demonstrates the Tecate environment, which supports collaborative computing, desktop video conferencing, database management, and visualization of earth sciences data among researchers located at multiple remote sites.

- The National Center for Supercomputing Applications shares newly developed task-directed visualization tools that assist specific inquiry and analysis activities of scientists, policy makers, educators, students, and the general public as they deal with environmental concerns.

- The U.S. Environmental Protection Agency's Scientific Visualization Centers and the National Environmental Supercomputing Center demonstrate a newly developed user interface, visualization, model-calibration, and collaborative-computing tool for air pollution and water quality modeling and decision support.

- The Global Learning and Observations to Benefit the Environment (GLOBE) educational program shows its newly created interactive visualization tool for networking K-12 students and institutions throughout the world. The GLOBE tool supports students' efforts to conduct environmental observations about planet Earth.

http://www.epa.gov/
http://www.khoros.unm.edu/
http://www.sdsc.edu/SDSC/
    Research/Visualization/
    Tecate/
http://globe.gsfc.nasa.gov/
    globe

Theresa-Marie Rhyne

Lockheed Martin
U.S. EPA Scientific Visualization
Center
4201 Building – 2nd Floor
79 Alexander Drive
Research Triangle Park, North
Carolina 27709 USA
+1.919.541.0207
+1.919.541.3967 fax
trhyne@vislab.epa.gov

Primary Collaborators

Polly Baker
National Center for Supercomputing
Applications

Gloria Brown-Simmons
The GLOBE Program

Peter Kochevar
DEC/San Diego Supercomputer
Center

John Rasure
Khoral Research Inc.

Contributors

Dudley Bromley, *Manager*
Mark Bolstad
Tom Boomgaard
Al Bourgeois
Todd Plessel
Penny Rheingans
Dan Santistevan
Lockheed Martin – U.S. EPA Scientific
Visualization Center

Becky Bishop
Khoral Research Inc.

Horace Mitchell, *Manager*
John Cavallo
Paul Diggins
Raul Garza-Robles
William Krauss
Kevin Mahoney
Pamela O'Neil
Shahram Shiri
Cynthia Starr
James Strong
Raymond Twiddy
Richard White
Mitchell Weiss
GLOBE Program – NASA/Goddard
Space Flight Center

Fritz Hasler, *Manager*
Zahid Ahmed
Jeff de La Beaujardiere
Marit Jentoft-Nilsen
Barbara Mones-Hattal
Public Use of Remote Sensing Data
Project
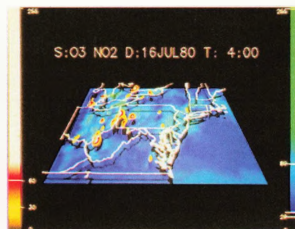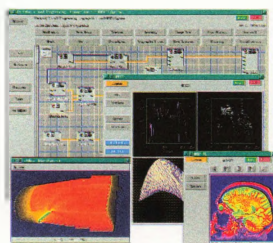
The MAGIC project comprises three principal components: an interactive terrain visualization application (TerraVision), a high-speed distributed image storage system (ISS), and a high-speed internetwork to link the computing resources.

TerraVision allows a user to view and navigate through a landscape based on high-resolution aerial and satellite imagery. Locations of vehicles (for example, from training exercises) can be superimposed on the view of the terrain and updated in real time. The ISS, which stores, organizes, and retrieves the processed images and elevation data required by TerraVision, consists of multiple coordinated data servers distributed around a wide-area network.

The MAGIC internetwork consists of several LANs interconnected by a wide-area ATM over SONET backbone. The network provides trunk speeds of 2.4 Gbps and access speeds of 155 and 622 Mbps.

Interactive, real-time, data-intensive applications like TerraVision and distributed storage systems resembling the ISS will become more common as high-speed networks become the norm. The developers of the MAGIC project are exploring some of the challenges introduced by such systems and developing technology that will foster widespread deployment in the future.

MAGIC is an ARPA-funded collaboration of the EROS Data Center, Lawrence Berkeley Laboratory, the Minnesota Supercomputer Center, SRI International, the University of Kansas, MITRE, Sprint, USWest, Southwest Bell, Northern Telecom, and Splitrock Telecommunications.

Hanan M. Herzog
Computer Systems Engineer
Mail Stop 50B-2239
Lawrence Berkeley Laboratory
1 Cyclotron Road
Berkeley, California 94720 USA
+1.510.486.4519
+1.510.486.6363 fax
herzog@lbl.gov
hanan@csua.berkeley.edu

TerraVision and the ISS Cooperate to Visualize Landscape
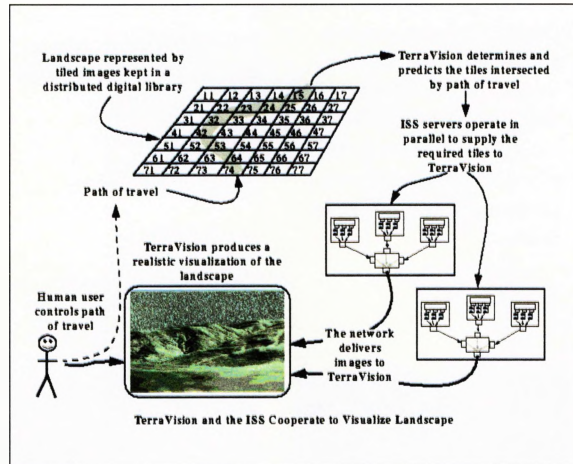
Neuro-Baby is a communication tool with its own personality and character. Through emotional modeling, it reacts to changing voices, handshake intensity, and facial expressions. Artificial neural networks allow the system to "learn" from individual human inputs and generate customized responses. A highly dynamic, spring-actuated hand interface allows Neuro-Baby to exchange realistic handshakes with its human acquaintances.

Two Neuro-Babies can be implemented on a network, and each can have a human communication partner. The Neuro-Babies' emotional states are transmitted over the network, generating appropriate actions at the remote site.

At SIGGRAPH 95, Network Neuro-Baby demonstrates its potential for international cultural exchange. A Neuro-Baby at the Institute of Industrial Science at the University of Tokyo communicates directly with a Neuro-Baby and its human acquaintances in the International Center at SIGGRAPH 95. As the two Neuro-Babies share emotional states, which are mapped and communicated to human beings at both sites, they demonstrate different ways of communication and expression of feelings, and enhance intercultural understanding.

Naoko Tosa

Department of Imaging Arts and Sciences
Musashino Art University
1-736 Ogawa-cho, Kodaira
Tokyo 187, Japan
+81.3.5397.3797
MGG01533@niftyserve.or.jp

Collaborators

Hideki Hashimoto
Kaoru Sezaki
Yasuharu Kunii
Toyotoshi Yamada
Kotara Sabe
Fumio Harashima
Hiroshi Harashima
University of Tokyo
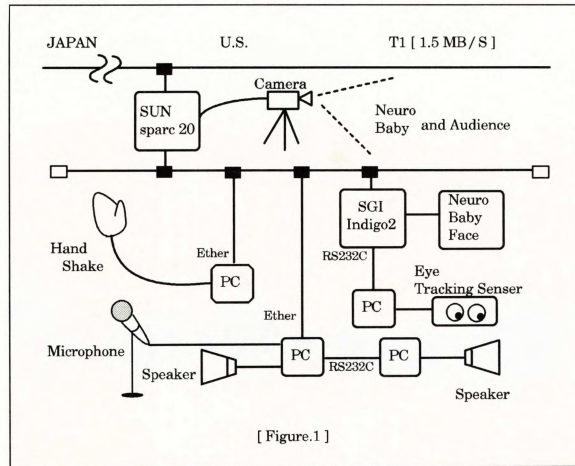
[Figure.1]

The process of computer inter-action can be identified by the fact that there are two channels of input (keyboard and mouse) and two channels of output (monitor and speaker) forming a canonical interactive loop. Interactive computer graphics research enriches this standard, two-input/two-output loop by increasing the number of channels and/or by augmenting existing channels with technologies such as 3D input devices and eye-tracking hardware used in conjunction with haptic or aural displays.

Many interactive artists have already begun to integrate these advanced technologies in their work, but the interactive media designer is forced to work strictly within the limitations of the standard two-input/two-output model due to the economics of working for a consumer audience. As a result, interactive media design has focused on the creation of nouveau pop-up books without taking full advantage of the computer's expressive power.

In One Input De Three Voices, graphic and industrial designers collaborate to cast aside the conventional interactive computing system to present a highly simplified set of three one-input/one-output interactive systems. The common input shared by all three systems is sound (microphone input), which was selected for its ease of use. This sound input is manifested as three separate interactive experiences (visual, aural, and tactile). All respond in real time at a monumental scale. Each of these experiences is realized using off-the-shelf technology to underline its proximity to the consumer market. This fundamentalist approach re-evaluates and reorganizes the current philosophies of interactive design and highlights the future role of the interactive designer.

Sony Corporation
Corporate Design Center
6-7-35 Kitashinagawa
Shinagawa-ku
Tokyo 141, Japan

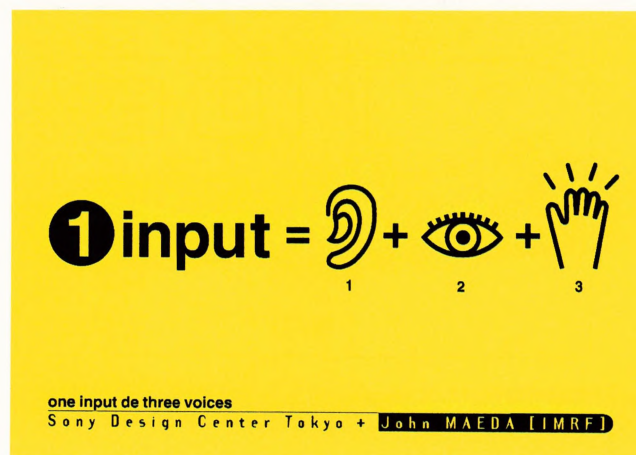**International Media Research Foundation**
casr@imrf.or.jp

Contributors

Yumie Sonoda
Jun-ichi Nagahara
Makoto Niijima
Haruo Oba
Hiroaki Nakano
Tatsushi Nashida
Kunihito Sawai
Yoshiaki Kumagai
Masami Hirata
Sony Corporation

John Maeda
Kazuo Ohno
International Media Research Foundation

one input de three voices
Sony Design Center Tokyo + John MAEDA [IMRF]

The Optimized Synthetic Infra-Red Interactive Simulation (OSIRIS) presents an immersive virtual environment for a simulated night-vision battle. Players attempt to find other players in a thermal environment so they can lase their opponents before getting lased themselves. In an ARL Stair Stepper device, they move through a forest of thermal trees over a high-fidelity terrain and view their environment through head-mounted displays. As they search for opponents, players try to avoid land-mines and other obstacles.

OSIRIS implements 3D thermal modeling, 2D infrared texture generation, infrared atmospheric effects, thermal sensor degradations, optimized scene rendering, high-fidelity terrain, aspect-unique trees, and dynamic terrain. Each of three networked environments interacts with the other over a LAN via DIS protocols using a common terrain database and common entity representations. Each also distributes the representation of its participant to the other environments. In this way, players are able to interact with one another as well as with their surroundings.

The project is designed to further advance the importance of detailed realism in the virtual worlds of the future.

Max Lorenzo

Communications Electronics Command/Night Vision & Electronic Sensors Directorate
10221 Burbeck Road, Suite 430
Ft. Belvoir, Virginia 22060-5806
USA
+1.703.704.3185
+1.703.704.1753 fax
lorenzo@nvl.army.mil

Contributors

David Poole
Robert Deaso
Young Lu
Alex Kekesi
Jae Cha
David A. Slayton
Mary Williams
Russ Moulton Jr.
Virginia Kaste
William J. MacKrell
Robert A. Paddison
Jeremy Riecks
Marc Roth
Frank Wodoslawsky

Ping was originally intended as a visual ride through the Internet in the free airtime of various TV stations. Today, it is a 3D datascape created interactively by Internet users.

Imagine a self-generated movie: the flight of Eye Agents through fields of gravitation triggered by world-wide distributed data objects. Based on hyperlinks in a World Wide Web map, Ping creates a distributed interactive multimedia environment (the 4D virtual datascape) that gives users a visual impression of networking. A virtual camera device called Eye Agent automatically renders a flight through the datascape, generating broadcast-quality output. Interactive creation takes place through the WWW interface,

which allows users to explore the datascape and contribute and position their objects on an interactive map.

The Ping datascape is composed of all netwide distributed map elements, which can be movies, geometries, or still images. It is generated by the users' remote interaction. What the Eye Agent sees is the datascapes' geometric representation composed of all netwide distributed map elements retrieved from their original locations. As it moves around on the 3D datascape, the Eye Agent controls the visual side of this self-generating movie on the Internet.

Users who view the datascape at SIGGRAPH 95 can jump into the datascape directly.

Their images appear on the interactive map and become part of the datascape. The Eye Agent character is tuned to view the datascape in the SIGGRAPH-generation mode with Jum-Ping and flying humans. As computer technologies converge with television, Ping explores the possibilities of user interaction and representation within interactive broadcast media.

Antya Umstätter
ART+COM
Budapesterstrasse 44
10787 Berlin, Germany
+49.30.254173
+49.30.25417555
antya@artcom.de
http://www.artcom.de/ping/
    mapper

Collaborators

Antya Umstätter
Visual Communications
Hochschule der Kunste

Steffen Meschkat
Physics

Axel Schmidt
Informatics
ART+COM

Force feedback plays an important role in manipulation in virtual environments. This project, an evolution of a system demonstrated at The Edge at SIGGRAPH 94, is realized by two desktop force displays. Two users feel reaction forces simultaneously, which enables them to cooperatively manipulate virtual objects. One user can grasp another's virtual hand and feel the force applied by the other user, a function that is useful in trainer-trainee interaction.

Shared Haptic World was developed with a new software tool, VECS (Virtual Environment Construction System), for programmers of haptic virtual environments. VECS enables high update rates of force display in a complex virtual environment. It interconnects multiple force displays through a network interface.

Using VECS, an autonomous free-form surface has been developed. It features functions similar to those of living creatures, such as surface tension, which enables restoration to its original shape. Other functions include feeding and avoidance of enemies. With VECS, users can interactively control time, congenital characteristics, and acquired characteristics of the autonomous free-form surface, and combine autonomous shape and intentional shape. This application can be applied to form study in industrial design.

In Shared Haptic World, two force displays demonstrate cooperative work. The system is also connected to a remote force display located in Japan. Visual and haptic aids compensate for the time delays between the Los Angeles and Japanese force displays.

Hiroo Iwata

Institute of Engineering Mechanics
University of Tsukuba
Tsukuba 305, Japan
+81.298.53.5362
+81.298.53.5207 fax
iwata@kz.tsukuba.ac.jp

Contributors

Hiroo Iwata
Hiroski Yano
University of Tsukuba
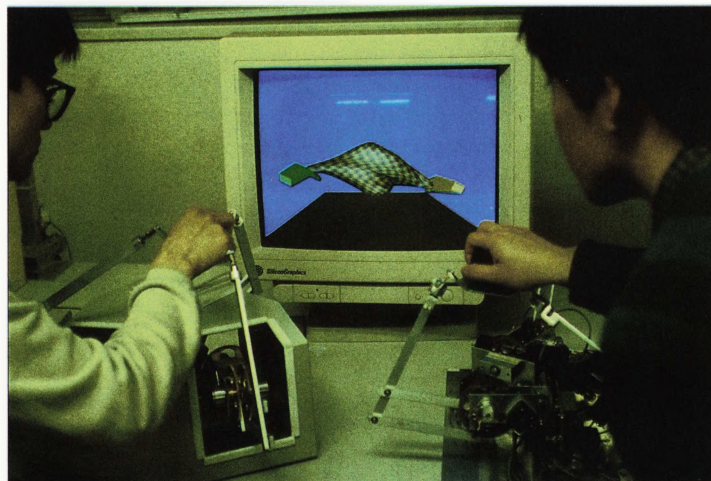
The Snake Pit links recent developments in ultra-high-resolution display technology and global-network connectivity with aesthetic and social concerns in contemporary art. It has three primary purposes:

- To explore technology's enormous potential to create forums for aesthetic and social engagement.

- To explore issues of mental health care and human consciousness in late twentieth-century urban life.

- To address a significant social issue through innovative uses of technology while expanding the boundaries of traditional artistic media and visitor participation.

Visitors use a simple touch-screen interface to engage with a near-photographic quality, 6.3-million pixel (~3000x2000) greyscale liquid crystal display, driven by extended hypertext markup language (HTML) and a customized World Wide Web browser. Whether they arrive electronically or physically, visitors are not passive

participants. Rather, The Snake Pit allows them to add their own experiences as multimedia commentary in the project's hypertext environment and by contributing to the project's online newsgroup (atl.society.mental-health).

With both laser-sharp statistical focus and lyrical abandon, The Snake Pit examines mental health issues through a hypertext of still and moving images, graphics, sound, and text. Its montage-like presentation is inspired by the layered nature of its subject and is driven by the developing potentials of liquid-crystal display technology, which offers the means to effectively present a visually compelling and multi-faceted exploration of a complex subject.

The physical installation creates an evocative setting for viewers to experience and participate in the events that unfold on the flat panel LCD. Viewers trigger the events through a simple touchscreen interface. By touching activated areas of photographs, they

navigate through a hypertext of digitized video, audio, photography, text, and statistics.

Recent technical innovations allow The Snake Pit to be a catalyst for personal reflection and social action. The striking presentation of the paper-like LCD, combined with extended HTML capabilities, create a powerful medium for artistic expression. Bi-directional hypertext capabilities provide a delivery and participation system for art and information. In order to take advantage of this high resolution and to give the artist more control over navigable space in the hypertext, HTML extensions allow specification of time-based imaging, display-specific rendering of images, and overlapping objects.

The Snake Pit evolved from Xerox PARC's PAIR project, an experimental program in which resident artists collaborate with PARC researchers. It suggests a model for future projects in which technology, art, and social concerns unite to create a participatory,

interactive forum linking diverse communities throughout the world.

Margaret Crane
M. Crane Communications
649 Page Street, #6
San Francisco, California 94117
USA
+1.415.255.8505
crane@parc.xerox.com

Dale MacDonald
Xerox PARC
3333 Coyote Hill Road
Palo Alto, California 94304 USA
+1.415.812.4914
macdonald@parc.xerox.com

Scott L. Minneman
Xerox PARC
3333 Coyote Hill Road
Palo Alto, California 94304 USA
+1.415.812.4353
minneman@parc.xerox.com

Jon Winet
Visiting Lecturer
Art Department
University of California at Davis
Davis, California 90516 USA
+1.916.752.0105
jawinet@ucdavis.edu
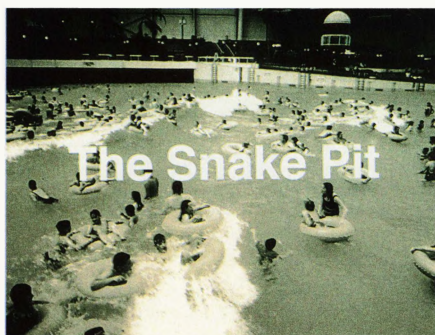
n Solar System Modeler, users fly through the solar system, travel between the planets, watch moons in orbit, and ride with a comet toward the sun. This immersive virtual reality uses networked computers to compute and portray the movement of satellites, planets, moons, comets, and asteroids in the solar system. Based on each object's orbital parameters and the date and time of day, motions are computed to support real-time interactivity with the virtual environment.

Solar System Modeler grew out of the observation that as the number of satellites in orbit increases, it becomes increasingly difficult to visualize the spatial relationships between space vehicles. The same difficulties arise in trying to understand the relationships among the planets, the planetary moons, the asteroids, and the comets in the solar system. When viewing the solar system, one would like to see the bodies that are visible from a point in space, the bodies that are visible from a location on a planet or moon, and the angular and distance relationships between two or more bodies.

Though it is difficult, if not impossible, to accurately visualize these extremely complex spatial and motion relationships, virtual environments allow an observer to comprehend them rapidly and relatively easily. However, portrayal of these relationships is a serious challenge. It requires an accurate 3D model of the objects; incorporation of orbital mechanics code; orbital motion data for the planets, moons, asteroids, comets, and satellites; and the locations of the stars.

Solar System Modeler relies upon distributed interactive simulation technology to create a complex environment by transmitting and sharing satellite position and velocity data with other actors in the virtual environment. The distributed interactive simulation approach uses several networked virtual environment stations to generate the single environment. Each node has its own local model of the environment, and there are no clients or servers.

Users of Solar System Modeler are completely immersed in the environment and can explore the entire solar system. For example, they can watch Jupiter's moons from the surface of Jupiter, from Io, or from a distance. They can fly through Saturn's rings, orbit Titan, and then hop over to Pluto. They can sit on the moon and watch satellites fly in orbit above the Earth. Location and point of view are entirely under the users' control from within the immersive environment. There are several panels that display information about user-selected objects.

Solar System Modeler changes perceptions of our galactic neighborhood. The solar system's great size and enormous complexity are immediately apparent, even to the nonscientist, from this immersive experience.

Martin R. Stytz
Department of Electrical & Computer Engineering
Air Force Institute of Technology
Wright-Patterson AFB, Ohio 45433
USA
+1.513.255.9270
+1.513.476.4055 fax
mstytz@afit.af.mil

Contributors

Martin R. Stytz
John Vanderburgh
Andrea Kunz
Steven Sheasby
Keith Shomper
Linda Myers
Mark Edwards
Neal Schneider
Air Force Institute of Technology
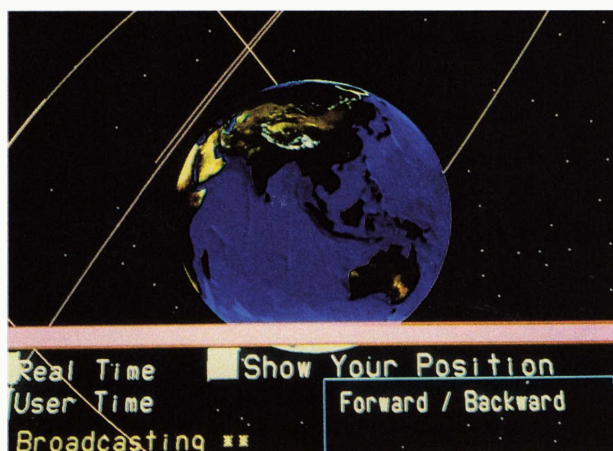
T_Vision is a broad-band application research project. It provides a distributed virtual globe as a multimedia interface to visualize any kind of data related to a geographic region. The virtual globe is modeled from high-resolution spatial data and textured with high-resolution satellite images.

A T_Vision database and real-time rendering system has been developed to handle this huge amount of data. Seamless links between different levels of detail allow continuous zooming from a global view down to recognizable features of only a few centimeters in size. The virtual globe can display many types of data, including biological, sociological, economical, and others.

This project is based on the concept of a transparent and worldwide broad-band, networked topography and surface data bank. Because it is impossible for a single location to store and maintain the huge amount of high-resolution data necessary for such a visualization application, the system automatically establishes an ATM connection to the server that provides the most up-to-date and highest-resolution data required for the current field of view (and visualization layer). These remotely accessed data are integrated unobtrusively into the user's system on the fly. A special T_Vision user interface based on a large real globe ("earth-tracker") facilitates the user's navigation around the virtual globe, so the user has full control over which information to view, when, and at which location.

A successful ATM T_Vision test network between Tokyo and Berlin was established in October 1994. A third node will be added this year, in Sunnyvale, California USA.

Gerd Grueneis
ART+COM e.V.
Budapesterstrasse 44
D-10787 Berlin, Germany
+49.30.254173
+49.30.25417555 fax
gruen@artcom.de
http://www.artcom.de/projects/
 terra/

Collaborators

Project Management
Gerd Grueneis

Ideas, Visual Database, and High Speed Networking
Pavel Mayer

Design and Concepts
Joachim Sauter

Ideas, Advanced Realtime Rendering, and Simulation
Axel Schmidt

Special Thanks
Hans Hueber, Hero Ischibashi, Joerg Jacobs, Rolf Kruse, Uli Lipka, Dirk Luesebrink, Gert Monath, Dieter Sachse, Erick Schmitz, Andreas Schneider, Christoph Stratmann, Susi Traeger, Henrik Tramberend and the rest of ART+COM.

This tele-robotic project allows World Wide Web users to view and interact with a garden filled with living plants. Users can plant, water, and monitor the progress of seedlings via the tender movements of an industrial robot arm.

The site is intended to evolve over a period of months. Anyone can view the site; the rights to plant and water are granted to anyone willing to make his or her email address known to other members. Events will be recorded in logs so that members can note progress and exchange unsolicited advice.

A previous project by some members of this team and others (http://www.usc.edu/dept/raiders/) used an industrial robot to permit remote excavation of a sand-filled archaelogical site. Such hunting and gathering is characteristic of existing Internet protocols.

This project explores a post-nomadic motif, where planting and agriculture require spatial and temporal continuity. Our objective is to illuminate what Neil Postman calls the "ecological effects of media" (Technopoly, 1994).

The Tele–Garden has appeared in the Digital Alchemy Show, San Francisco and the Interactive Media Festival, Los Angeles.

http://www.usc.edu/dept/garden/

Ken Goldberg
+1.213.740.9080
goldberg@usc.edu

Joseph Santarromana
+1.213.664.1245
Joes18790@aol.com

Project Team

George Bekey
Steven Gentner
Rosemary Morris
Carl Sutter
Jeff Wiegley

Telemedicine allows medical specialists to consult across the barriers of space and time. As a health care provider assists the patient, the consultant conducts an interview and performs an appropriate physical examination. The health care provider is either the patient's primary physician, a physician assistant, a nurse practitioner, or a specially trained nurse who works with the primary physician.

Electronic stethoscope, dermatology camera, otoscope/opthalmascope, ultrasound, and x-ray transmission are available to aid in the consultative examination. The consultation may be videotaped for the primary physician to view at a later time or for the patient to take home. All videotapes, transmitted records, and written consultation reports are handled with the utmost security to preserve patient confidentiality.

The East Carolina University School of Medicine and its Center for Health Sciences Communications have been involved with distance learning for five years and telemedicine for over two years. In 1994, ECU completed construction of a telemedicine suite with four interactive rooms – the first facility of this kind in the U.S. Telemedicine is an efficient means of medical consultation in rural America. The program reaches out to prisons, military bases, rural hospitals, and clinics. Network applications include: distance learning, telemedicine, database access, supercomputer applications, and access to the global village. Benefits to the region include: access to a statewide network, access to supercomputers, access to the university database, seminars and workshops, community meetings, and remote medical consultations.

David Balch
School of Medicine
East Carolina University
+1.919.816.2466 x 2468
+1.919.816.2495 fax
dave@sparky.med.ecu.edu

Gloria L. Jones
Center for Health Sciences Communication
gloria@sparky.med.ecu.edu

REach TV
East Carolina University School of Medicine
+1.919.816.2468

Telemedicine Module From Above
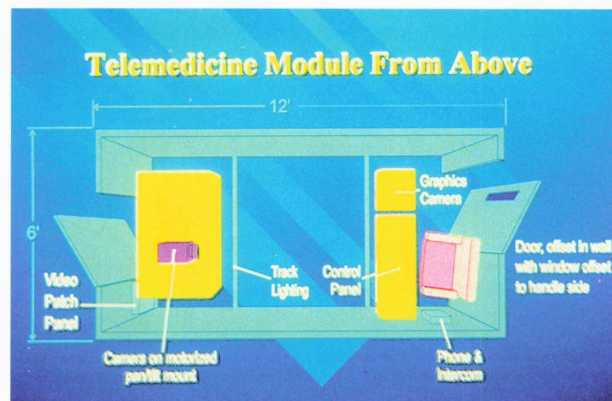
The InfoZone is a community networking project that provides enhanced education, government, healthcare, business, and cultural opportunities to this southwest Colorado region. It is also a research program that promotes an "ecology of the information environment."

A project of the Telluride Institute, a not-for-profit research, education, and cultural organization, the InfoZone has grown from broad-based community master planning and pro-active cooperation among regional institutions, businesses, and individuals. It is designed to be of service to the health, diversity, and sustainability of the Telluride regional community, by endowing sources of local education, health care, participatory democracy, economic opportunity and culture with greater information access and intelligence. It is also designed to serve neighboring ranching and former mining communities in the Southwest Rocky Mountain region.

For SIGGRAPH 95, a special public forum has been created, with various special-interest project folders on education, the arts, tele-community planning, and live chats ("Tellu-Tell Me"). Topics of particular interest to many include: community health, environmental issues, Native American writers, cultural master planning, and salons. Dedicated networked computers at SIGGRAPH 95 allow visitors to connect with users throughout the Telluride Region, at home, and via public access tele-computing sites at the Library, the School, the Bank, the Medical Center, the Arts Council, Agriculture Extension, the Steaming Bean Cafe, and the Telluride Institute. The system allows for participation and exchange with text postings, audio, and images.

The InfoZone is a pilot project for broad-spectrum community development and education in rural areas, using information and telecommunications technologies. It was planned as a pragmatic answer to real issues facing the town of Telluride, and as a test-bed for systems, services, and the long-range social, economic and cultural implications of "telecommunities" in our "information society."

As governments and corporate interests form alliances and position themselves to create a new National Information Infrastructure, there is a growing movement among regional and local urban communities of dedicated individuals more concerned about shaping a more human, socially serving direction for the telemediated future.

http://infozone.telluride.co.us/InfoZone.html

CommunityNet (First Class BBS): +1.303.728.5553

Richard Lowenberg
Box 1770
Telluride, Colorado 81435 USA
+1.303.728.6960
+1.303.728.4638 fax
rl@infozone.org

Waxweb 2.0 is the first interactive, intercommunicative feature film on the World Wide Web. It is also the first Internet-distributed narrative to offer real-time 3D navigation through a story.

Based on the feature film "WAX or the discovery of television among the bees," Waxweb 2.0 consists of 3000 Web pages with 25,000 hyperlinks; 85 minutes of digital video; a soundtrack in English, German, French, and Japanese; 5000 color stills; and more than 250 real-time 3D scenes filled with thousands of spatial hyperlinks. It is the first large-scale, dynamic implementation of the Virtual Reality Modeling Language (VRML), the accepted standard for distributed virtual reality on the Internet. Digicash, a digital payment scheme, and Sesame, a system for real-time, multi-user communication on the World Wide Web, have also been implemented.

Waxweb 2.0 runs on a modified MOO capable of serving both HTML and 3D VRML to multiple simultaneous users. Two-dimensional users logon as a character and enter the hyperfilm at the SUPERSTORY, a multi-page condensation of the narrative. From there, they can travel to SHORT STORY, the hypermedia film with a medium level of detail, and finally to SHOT BY SHOT, where every shot in the film is described, and where the film can be downloaded and viewed. From there, users can travel to a 250-category visual index. Also available are several hundred pages of additional backstory in FRAGMENTS and sections based on more than 400 KEYWORDS, which are used to re-edit both SHOT BY SHOT and FRAGMENTS. Despite this complexity, it is always easy to find out how a page or part of a page fits into the entire story.

Users can enter the 3D "Optoplasmic Void" from many places in the document, or by using a direct URL. Hyperlinked 3D objects are loaded into the VRML browser, and users can click on parts of the objects to load new scenes, change the web browser's page, or play parts of the movie. Users can also add to the story with their own immediate, publicly visible hypermedia, using an authoring interface built into the site. Custom scenes that dynamically recombine Waxweb and user-added VRML objects allow creation of a dynamic 3D interstory on the network.

While most videoserver trials take place on closed networks, Waxweb 2.0 uses open-system tools and existing bandwidth to experimentally demonstrate a practical, globally distributed, intercommunicative, scalable, and financially independent hypernarrative server, incorporating hypertext, audio, video, and virtual reality.

2D entrance: http://bug.
  village.virginia.edu
3D entrance: http://bug.
  village.virginia.edu/vrml
MOO entrance: telnet to
bug.village.virginia.edu.7777

David Blair
artist1@interport.net

Contributors

Authoring
David Blair

Technical Director
Tom Meyer

Suzanne Hader
David Klaphaak
Anna Youseffi
Melynda Barnhardt
Emma Johnson
Laura Mullen

Talking is the interactivity that originally made us different from other animals. This verbal communication could be regarded as the first instance of our "being in the world" of cyberspace – a fictitious interactive environment.

Over the centuries, human beings have learned to speak up and express their deeper thoughts. Prophets, politicians, priests, poets, and philosophers – all are "neuromancers," hacking in the interpersonal cyberspace of spoken words. This implies a redefinition of "democracy" as the state of mind where each and every constituent could freely "hack" into interpersonal cyberspace and deeply interact with every other member of society.

With current digital technologies, could we give any meaning to this definition of "democracy"? That's the question that inspired Virtual Discussion, which was produced for the Sakuzo Yoshino Memorial Museum. The museum commemorates Japan's historical thinker of that name, who is well known for his democratic ideas. The goal was to develop an interactive program for free-speaking states of mind.

In Virtual Discussion, participants choose one of two issues. A computer-generated virtual host introduces you to those issues and guides you into a conference room. There, just by clicking on the screen, you may watch and hear any other participants expressing their opinions in the form of digital video. Then, after you decide on your own position, pro or con, it's your turn to speak up, and your comments are automatically recorded and converted into the database of digital video. Your opinion is registered as a crucial part of the deliberative process. Subsequent participants just click on the picture of your face to hear your speech and personal data.

With its ability to digitize many comments and instantly collect them in a database, Virtual Discussion could facilitate creation of automated, computerized survey systems. The system's capacity for storing video information in a database could be used to develop an interactive system that dynamically combines and manipulates such visual images, even for a dating device that helps boys meet girls in such virtual environments, for example.

Perhaps, some day in the 21st century, Virtual Discussion will be a real tool of democracy, as it was originally conceived.

Yuichiro Kamata
Cyber Network Co., Ltd.
Tokyo 160, Japan
+81.3.3225.1411
+81.3.3225.1412 fax
cyber@po.iijnet.or.jp

Nobuo Masuda
5111 Denny Avenue #10
North Hollywood, California
91601 USA
+1.818.505.1837
+1.818.505.1548 fax
cyberenter@aol.com

Contributors

Producer/Director
Yuichiro Kamata
Mitsuaki Ota

Art Direction
Syoji Asaba
Tomoko Hiraoka

Assistant Producer
Nobuhiro Tsubone

Music
Miwa Kawai

Programming
Flux Tone
Maho Obata
Yuichi Nakamura

Simulation of virtual buildings, before they are physically constructed, is useful for designers and clients. With this novel interface device for walk-through simulation, the user perceives a 360-degree image of virtual space and a sense of walking while the position of the walker is fixed in the physical world.

The walker wears a head-mounted display, foot-mounted omni-directional sliding devices, and a hoop around the waist, which limits the walker's position. A specialized roller skate equipped with four casters enables two-dimensional motion. The device has a brake pad at the toe. When the walker steps forward, the break pad generates friction force at the backward foot, and the friction force enhances haptic feedback.

The walker can freely change the direction of walking in the hoop. The length of the step is measured by an optical encoder connected to the caster. The virtual space is correlated with the motion of the feet and body and viewed in a head-mounted display. Novice users usually hold the hoop to maintain their balance. Experienced users can push their waists against the hoop and walk fast or even run.

The system enables remote collaboration between architects and their clients, who can experience a house or other building while it is still in the design process. The design can be interactively changed in real time by the remotely located designer. At SIGGRAPH 95, models of virtual buildings are delivered via the Internet.

Hiroo Iwata

Institute of Engineering Mechanics
University of Tsukuba
Tsukuba 305, Japan
+81.298.53.5362
+81.298.53.5207 fax
iwata@kz.tsukuba.ac.jp

Contributors

Hiroo Iwata
Takashi Fuji
University of Tsukuba

Ground personnel at NASA's Goddard Space Flight Center monitor the health and safety of the Space Shuttle and other Earth-orbiting satellites such as the Hubble Space Telescope. This task includes not only performing quick "sanity" checks on the satellite telemetry, but also analyzing second-order information such as the spatial relationships between components of the satellite. For example, when monitoring the Space Shuttle, it is important to know the proximity of the Remote Manipulator System (RMS) – the robotic arm – to the wall of the payload bay or to a satellite that is to be grasped.

VR MON applies virtual reality technologies to make this task more efficient than when it was performed using traditional display equipment. It enables analysts to more

quickly and easily survey the current physical environment of a satellite. Within seconds of receiving live telemetry from a satellite, VR MON presents the analyst with a stereographic representation, using a Fakespace BOOM 3C, of the satellite and its surrounding environment, including the Earth, the sun, the moon, the planets, the stars, other spacecraft, and user-definable objects. The BOOM not only provides a high-resolution, stereoscopic display of the environment, it also supports natural interface metaphors for users. For example, a user can physically look around to see how close objects are.

All objects are depicted in the correct position with a selectable level of realism (the Earth's surface features can by displayed using polygons or texture maps, for example).

Users can easily fly around and view the environment from virtually any location, including a planet, a sensor field-of-view, the end effector of the RMS, or the shuttle cockpit.

Many options are available in VR MON, such as displaying velocity and position vectors, textual output of attitude and orbit information in numerous coordinate systems, tracking data and relay satellite coverage analysis, flexible operational modes (such as playback mode), four-way split screen display (not available when using the BOOM), and user-definable viewpoint locations.

At SIGGRAPH 95, VR MON provides visitors with true outer-space telepresence with live telemetry transmitted from NASA's Goddard Space Flight Center.

Stephen Maher

NASA
Code 932
Greenbelt, Maryland 20771 USA
+1.301.286.3368
+1.301.286.1634 fax
maher@holdeck.gsfc.nasa.gov

Collaborators

Stephen Maher
Jim Jeletic
Wendy Shoan
NASA Goddard Space Flight
   Center

Dillard Bolland
Glen Tamkin
Computer Science Corporation
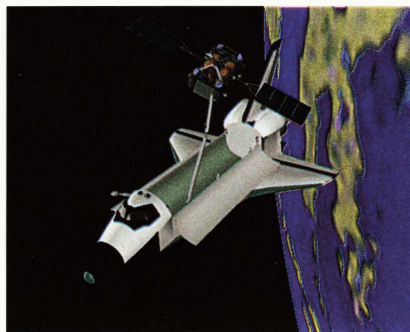
C I T Y S P A C E

CitySpace is an international networking project that invites young people from across the Internet to construct and explore a virtual city environment. The installation consists of a networked, interactive theatre in which visitors navigate the imaginary city and construct new buildings, vehicles, characters, and other creations.

SIGGRAPH 95 attendees are able to interact and explore CitySpace simultaneously with online visitors from around the world. The project is designed to help young people ages 10-16 develop network communication and computer graphics skills.

The CitySpace project thanks Silicon Graphics, Inc., the Electronic Visualization Laboratory of the University of Illinois at Chicago, USENIX, The Exploratorium, and the Ontario Science Centre.

Zane Vella
Coco Conn
Jim Thompson
Chris Cederwall
Jim Damiano
David Goldberg
info@cityspace.org
http://cityspace.org
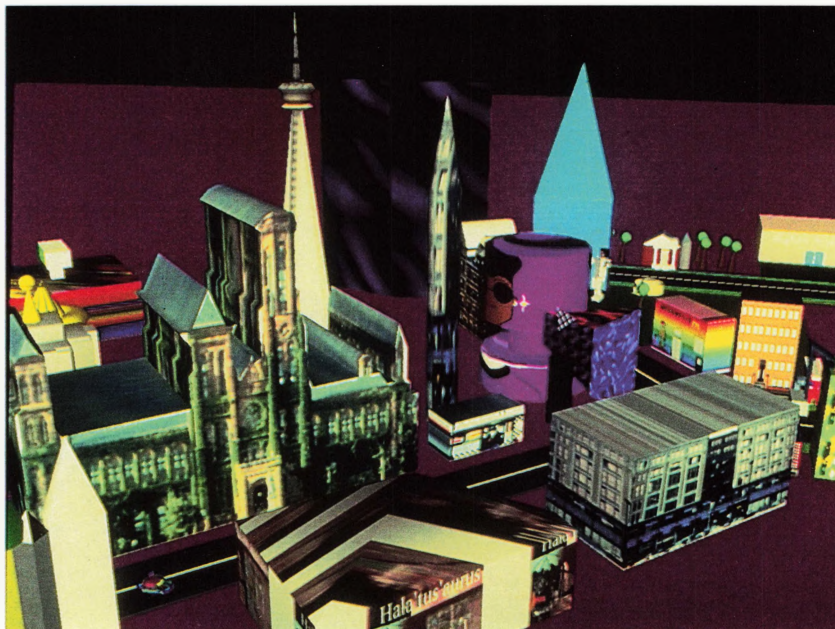
The Computer Clubhouse at The Computer Museum is a model learning environment where young people explore their own interests and become confident learners. It was developed as a joint project between The Computer Museum and the Massachusetts Institute of Technology Media Laboratory with generous foundation and corporate support.

The Clubhouse includes a diverse community of mentors and young people from urban communities who work together to explore and create exciting projects using state-of-the-art computers and professional software tools. Mentors are students and professionals in art, music, engineering, education, and a variety of other fields. They are available to answer questions and support exploration by participants. Members range in age from 10 to 18 and represent the diverse communities of Boston. They spend days, weeks, even months working on projects they find personally meaningful.

Through their participation, they develop important skills for college and career. The Clubhouse provides unique opportunities for underserved youth in Boston, young people who have little or no access to computer technology in their homes or schools. Through advanced computer technologies, they have found new ways to express themselves. For some of them, this is their primary means of artistic expression.

The ability of artists to share their work with others cannot be overvalued. Sharing offers artists insight into themselves and an opportunity to learn about others through their reactions. This is especially important when the interaction begins to cross social, economic, cultural, and age boundaries. Through the World Wide Web, the young people at the Computer Clubhouse have found a stage to share their ideas, expressions, and feelings with an international audience.

The Clubhouse members use tools such as Adobe Photoshop, Pixar Typestry, AutoDesk 3D Studio, a Hewlett Packard ScanJet II, and a RasterOps video capture card to create the art featured in the Clubhouse Online Art Gallery. Mentors work with members to create the format for the pages.

Each artist has a home page with an image of the artist, examples of artwork, and biographical information. At SIGGRAPH 95, attendees offer feedback and comments via online forms and email. Clubhouse members respond with new WWW pages and email. SIGGRAPH 95 attendees are also encouraged to submit their own WWW addresses and create pages to share with the Clubhouse artists in Boston during the exhibition.

http://www.net.org/ clubhouse.html

Brian Patrick Lee
The Computer Clubhouse @ The Computer Museum
300 Congress Street
Boston, Massachusetts 02210 USA
+1.617.426.2800 x 347
+1.617.426.2943 fax
blee@media-lab.mit.edu

Featured Artists
Jose Cintron
Israel Cook
Peter Faria
Mike Lee
Deborah Ruiz

HTML and Graphics Conversion
Brian Patrick Lee
Dan Lottero

WWW Server Configuration
Dan Ellis

Concept
Sam Christy
George Fiefield

Collaborators

Sam Christy
Christina Cooke
David Greschler
Noah Southall

W hile the price of animation tools and computers decreases constantly, and the speed and complexity improves with each new version, the process of animating a character with a mouse and computer monitor is still a painstaking problem. The required tasks are mastered by only a few with the patience and skill to decipher tables of numbers and bounding box representations.

To bypass this problem, Video Bits and Mr. Film Studios combined an Ascension Flock of Birds body suit, a Xist face tracking helmet, proprietary studio animation software, and a Silicon Graphics Onyx Reality Engine2 to create Interactive Creatures. As the participant moves in the suit, the computer software translates the moves and draws a computer graphics character in real time, providing instant feedback and real-time results for recording.

This approach opens computer graphics to whole new groups of people and situations, including SIGKids, where students have the opportunity to put on and animate a new personality, and produce performance animation in a single day. A team of students can take up the various controls and animate a character in a virtual environment to tell stories and produce shows.

Although this method of production is just starting to gain acceptance in Hollywood and is considered secret technology by some of the studies that have started exploring its capabilities, at SIGGRAPH 95 Interactive Creatures gives children the opportunity to be a new character and lets them produce and take home a complete rendered video of their experience.

Derek Woolverton

Video Bits
1310 East Orange Grove
Boulevard, #112
Pasadena, California 91104 USA
woolstar@erehwon.caltech.edu

Contributing Companies

Video Bits
Mr. Film Studios
Ascension Technologies Corp.
Vierte Art GmbH
Systech Corporation
Silicon Graphics. Inc.
Visual Interactive Design Inc.
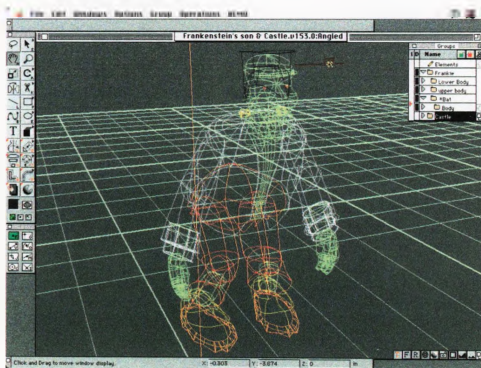
A new regional network is connecting K-12 schools, colleges, and universities in Monterey and Santa Cruz counties adjacent to the Monterey Bay National Marine Sanctuary. The network provides researchers, educators, and students full Internet access and free tools for text, hypertext, multimedia, audio, and video. The network is using this connectivity to participate in SIGGRAPH 95.

Most Monterey Bay educators are new to the Internet. This connection to Interactive Communities helps them see the information superhighway firsthand and explore how live interactive graphics can be used in the classroom. Collaborative relationships are being established before, during, and after SIGGRAPH 95.

The following home pages show local efforts:

Learning About Monterey Bay (LAMBAY)
http://lambay.cse.ucsc.edu/ mb

Monterey Bay Regional Education Futures (MBReEF) Consortium
http://www.ucsc.edu/ mbay-region

Initiative for Information Infrastructure & Linkage Applications (I3LA)
ftp://taurus.cs.nps.navy.mil/ pub/i3la/i3la.html

Real-time Environmental Information Network & Analysis System (REINAS)
http://csl.cse.ucsc.edu/ reinas.html

Don Brutzman
Code UW/Br
Naval Postgraduate School
Monterey, California 93943-5000
USA
+1.408.656.2149
+1.408.656.3679 fax
brutzman@nps.navy.mil
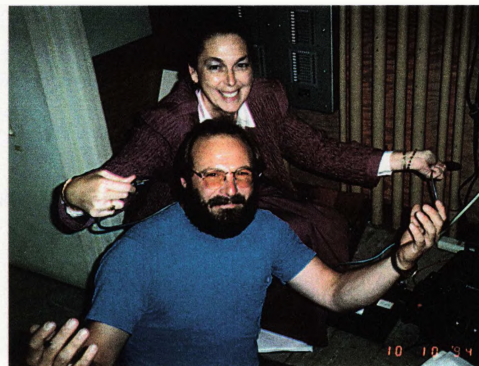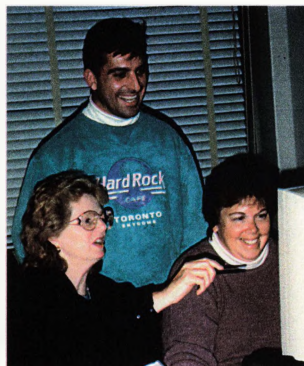
The legend of Merlin The Enchanter is the theme of an interdisciplinary study spanning continents, cultures, platforms, and languages in a collaborative effort to make optimal use of available computer graphics and telecommunications technologies.

In the Merlin Link, the focus is on human resources, on the ability to spark the enthusiasm of the young, promoting creativity and transfer of skills and expertise through shared experience. The creators of the project (the group from Saint Malo, France that presented The Circus project at SIGGRAPH 94) have been exploring Arthurian legends and myths, and investigating Celtic rites through the ages. Saint Malo is close to the Forêt de Brocéliande where the Brittany version of King Arthur and The Round Table was located.

Last December, "Barde de la Côte d'Emeraude" came to tell the group fireside tales and legends, took them on a picnic in the forest, filled their minds with tales of Merlin and Vivian, and inspired them to write their own version of the legends. Three 15-year-olds (Maël, Eva and Pierre-Elie) developed a storyboard, created the key-frame on an Amiga 2000, and started working on animations. Some fifty kids in Saint Malo participated in the project.

Most of the participants collaborated via Minitel, though a few got access to the Internet. Many groups joined the effort, from: art schools and universities, training centers in Paris, the United Nations International School in New York, the Centre National de la Bande Dessinée Images, Angouleme, and the Ecole Normale Supérieure de Cachan. Several offered technical assistance to the kids, visiting them on location for a spiritual experience in the forest.

The project mushroomed rapidly. SupInfoCom students in Valenciennes offered to share a bibliography on the Internet. Another group of students, from A.F.I.D.E in Paris, developed an interactive CD-i adventure game on the same theme. Microcam, an Apple user group in Rennes, offered the use of their facilities and equipment. Scott Lang of the United Nations International School in New York met with the group in Orlando and offered technical support. Students in Saint Malo and in New York are now exchanging ideas and impressions via email. They share storyboards and images, or develop their own independently.

All along, one of the project's main concerns was to establish bridges among a variety of platforms and software. In mid-April, keyframes were placed on the Internet where they are shared in a non-linear chained animation. Three spaces were assigned: one for browsing through text and downloading images, another as a forum for suggestions and questions, and the third for uploading legends, keyframes, or completed segments of animations.

This project has generated a lot of hope and focus to teenagers in Saint Malo, an area full of gloom (unemployment reaches 16 percent) and a sense of isolation and rejection. They have researched many fascinating topics, shared their findings, and been appalled to discover that the whole enchanted forest will soon be flooded by a new dam. Now they are using computer graphics to bring this fact to the attention of the world at large.

At SIGGRAPH 95, the group presents a Treasure Hunt that will be followed in real time in The Forêt de Brocéliande. The American Museum of the Moving Image in New York will document this adventure in November.

Huguette Chesnais
Cyclop Production
La Moisais, 35730 Pleurtuit,
France
+33.99.88.62.96
gue@altern.com

Collaborators

Jean-Yves Gaultier
Achim Gliem, Maël
Eva, Pierre-Elie
Centre Allende

Patrick Saint-Jean
Ecole Normale Supérieure de
Cachan

Marie-Anne Fontenier
Lydie
Olivier
Miguel
SupInfoCom

Thierry Chilliard
Centre National de la Bande
Dessinée Images, DIN

Philippe Chaufourier
Chistophe
Vincent
L'Institution

Jean-François Bourrel
Bertrand Lamenant
MICROCAM

Martine Delage
A.F.I.D.E

Scott Lang
United Nations International
School

L'équipe d'Imagina

Le Festival Europeen de la
Jeune Création en Infographie

The American Museum of the
Moving Image

Huguette Chesnais
Cyclop Production
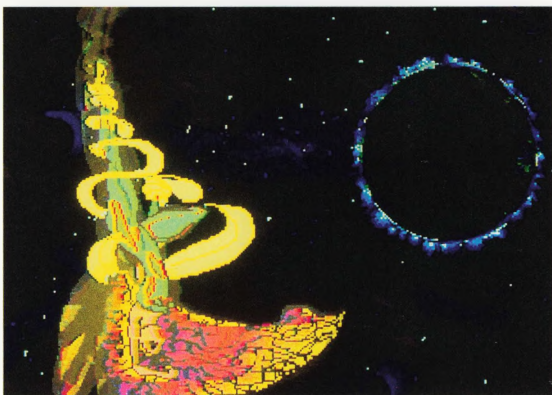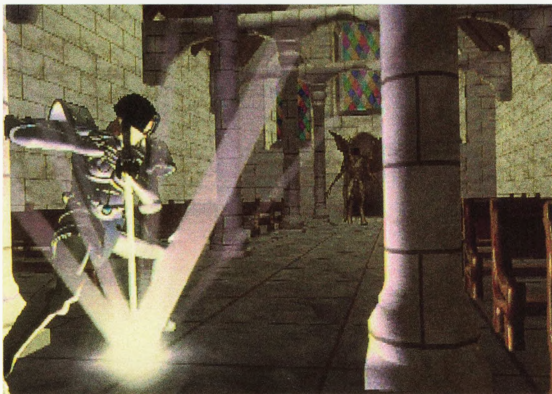
The SIGKids Production Lab is a sponsored digital broadcast production facility through which young people, artists, and educators demonstrate their works in progress and their mastery of complex digital audio, video, and computer graphics production techniques. The lab emphasizes real-time international network collaboration and the use of computer graphics tools to enhance inter-cultural communication and exchange. Special attention is focused on maximizing interaction among state-of-the art digital video production, motion-capture engineering, digital audio production, and digital networking.

At SIGGRAPH 95, lab participants produce a daily program for distribution at the Los Angeles Convention Center and throughout the world via GraphicsNet. The SIGKIDS Production Lab is a project of Digital Circus Productions, Inc. and is made possible by:

American Film Institute
Autodesk, Inc.
Microsoft Corporation
Pacific Bell
Radius Inc.
Silicon Graphics, Inc.
Sony Electronics, Inc.
Sun Microsystems Computer
   Company

Space colonization, a natural extension of virtual reality technologies, will develop as an outgrowth of interactive communities currently online with electronic networks. Space Colonies includes development of a homepage for the World Wide Web with a 3D computer-generated model and a research database with information that can be accessed and received globally.

In the present version, a double click on the space colony leads to a larger view of the model. Hypertext explains the project's purpose (to begin the design for future colonization in space) and lists current research topics related to human needs in an artificial environment. This project represents a beginning study for design of an actual space colony, an outer space environment that can accommodate approximately 56 humans who can maintain their species' survival. The project is networked for interactive collaboration. In the conference area, viewers can study the 3D design for the colony on the computer terminal and offer feedback on the design.

The intention of this exhibit is to prepare humans to visualize a future of change on their planet and to facilitate a collective effort to prepare for that future. Although the need to colonize space has not been acknowledged by government authorities, Earth's environment shows definite signs of a future in which it will be necessary, at minimum, to build artificial environments on earth for human protection and life extension. A step beyond this possible future is development of similar environments in space.

Paras Kaul
Paras West Productions
11714 Goshen Avenue,
Apartment 204
Brentwood, California 90049 USA
parasw@liberty.com
http://www.well.com/www/
     parasw/

Contributors

Design
Crystl Peritore
McClatchy High School
Sacramento, California USA
+1.916.446.5344

Communications
Masahiro Kahata
Psychic Labs Inc.
280 Park Avenue South, Suite G
New York, New York 10010
USA
+1.212.353.1669

Gohsuke Takama
Meta Sound
Tokyo, Japan

Dominic DeMaggio
Sound Production, LA

Deep River Books

Special Thanks To

Voice
Author/Shaman
Terrence McKenna
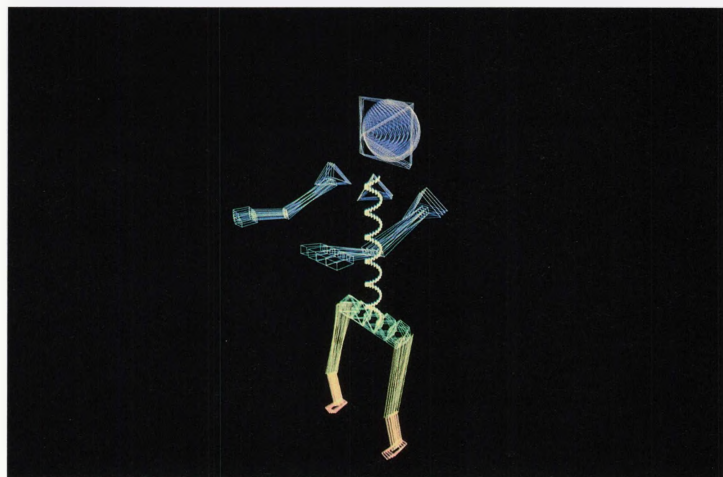
In this collaboration, young students in Jerusalem, Pittsburgh, and Los Angeles are developing ideas, digital imagery, and multimedia pieces about their heroes. They communicate these works to their remote companions through World Wide Web pages, email, tele-painting, videoconferencing, and data transmission. Ultimately, through QuickTime movies co-authored by the students and realized with the assistance of TeleCommunity teachers, the collected works are brought together as queries and responses representing a dialogue between the students' chosen or invented heroes.

HEROES is a cultural exchange, in which students share their perceptions of popular icons, portrayals of heroes, role-playing, cross-cultural dissemination of ideas, articulation of transforming experiences, conveyance and clarification of societal assumptions, and the search for and definition of identity. From these activities, new understandings arise and limiting stereotypes are overcome.

At SIGGRAPH 95, HEROES is a virtual studio environment that sustains the project's working relationships and international dialogue, and constructs novel multimedia pieces and interactive digital movies based on thoughts and digital materials shared by participants before and during the conference. The virtual studio consists of hardware and software linked to the rest of the world (and each other) through local and international networks. The application grows through networked response and interchange. Works are created through collaboration.

Interaction and response-oriented relationships are the basis of this undertaking, whether manifested in the human activities of communications, collaboration on media pieces, or in the actual technology and interactive quality of multimedia work or the software interface. Visitors encounter work that is rich in content and meaning, developed through collaborative efforts in participatory media, and witness a commitment to education and exploration, by and for the young, for the future.

Robert Dunn
Arc Vertuel, Inc.
111 The Oaks
Pittsburgh, Pennsylvania 15215
USA
+1.412.781.1563
+1.412.781.8138 fax
rd1s+@andrew.cmu.edu

Contributors

Project Co-author
Melanie Carr
Carnegie Museum of Art
Nathan Fullerton
Carnegie Mellon University

Susan Hazan
Israel Museum Youth Wing

Junior MultiCultural Computer
Academy, Duquesne University

Students in Jerusalem,
Pittsburgh, and Los Angeles

The lounge@siggraph is a gathering place and showcase for collaborative, interactive avant-garde art and music projects from Europe and North America.

Anti•rom: The Antidote to Multi-mediocrity

This interactive art event on CD-ROM created by seven London artists offers a radical critique of contemporary multimedia through a series of ironic experiences and formal experiments that explore the nature of interactivity.

Andrew Cameron
SASS/Anti•rom, London
+44.171.727.0812
andy@culture.demon.co.uk
http://cyan.medi.wmin.ac.uk/
    antirom.html

Urban Feedback

A CD-ROM and World Wide Web site that explores expressions of urban life. Artists, poets, philosophers, and composers create an interactive cityscape that provides new insight into urban life and media.

Giles Rollestone
Perfect Indigo, London
+44.171.794.5916
giles@urban.demon.w.uk

Consumer Product & Encyclopedia of Clamps

Los Angeles artist Bill Barminski presents "Bar-min-ski: Consumer Product," which is fast becoming a cult classic CD-ROM title, as well as his new works-in-progress: Encyclopedia of Clamps and Cyclops Boy.

Bill Barminski
Consumer Productions, Los Angeles
+1.310.338.9720

MouseHouse/Space Invaders Student Demos

Student projects that explore new approaches to interface design, 3D graphics, audio, animation, and video.

Norm MacLeod
MouseHouse Multimedia Center
Arhus, Denmark
+45.8612.9402
mmcmpope@intnert.uni-c.dk

The Virtual Gallery

Be among the first to try this new "free-motion" virtual reality platform that does away with cumbersome head-mounted displays and other gadgetry. The Virtual Gallery is a very special museum that allows you to step into the frame and literally walk around inside your favorite painting. Virtual paintings both familiar and obscure are created by students from North America and Europe.

Celia Pearce
CeliaPear@aol.com

Virtual Nightclub

Created by a group of London artists, musicians, and designers, Virtual Nightclub is a wild and wonderful walk-through environment of changing music, psychedelic mazes, dance, fashion, and philosophical excursions through the minds of poets and philosophers. A delightful adventure in underground culture from the people who brought you Burn:Cycle. Soon to be released on CD-i and CD-ROM.

Trip Media, London

Ted Cohen
Philips Media, Los Angeles
+1.310.444.6500

Musical World

Enjoy an evening in the bohemian district of a virtual downtown. Visit an interactive stand-up comedy club, a labyrinth of jazz poetry, and a musical statue that lets you change instruments and themes to create your own musical composition. A special sneak preview of an unpublished work-in-progress.

Martha Swetzoff
Commotion New Media, Los Angeles
+1.310.451.6240
martha@commotion.com

Duran Duran "Universe"

An interactive CD-ROM tour of Duran Duran's video and music catalog, including interviews with the band, remixing, and hidden games and features.

Malcolm Garrett,
Alasdair Scott
AMXdigital, London
+44.171.613.5300
amxdigital@world.com

Global Goons

An avant-garde music and poetry CD-ROM from London produced by the publishers of Informer, a survey of the advertising industry and the first regular disk-based magazine in the U.K.

Colin Taylor
Studio Dm, London
+44.171.490.3043
studiodm@demon.co.uk

Inneractivity Finder – ColorScope

Inneractivity Finder – ColorScope is based on human-computer interaction techniques that do not use either the keyboard or a mouse. The project focuses on the collaboration between two people via their reaction to colors.

A color-animation program is used to generate a screen display and a set of two head-mounted EEG brainwave detectors as input devices. Data from the EEG brainwave detectors are processed by the comparison program and in turn control color patterns that appear on the screen. As the two separate inputs become more similar, the color patterns become more harmonious. Participants are automatically sensitized and learn about the collaboration process by focusing their thoughts together.

The presence of colors in our living environment continuously stimulates human thoughts and emotions, unconsciously or consciously. In urban environments, people are exposed to fixed, saturated colors on a daily basis, which might change their ability to perceive color. In experiencing the Inneractivity Finder – ColorScope, participants experience the effects of color from a new perspective.

Gohsuke Takama
Meta Sound Engineering
+81.3.3493.7449
gt@twics.com

Peggy L. Bartlett
Masahiro Kahata
IBVA Technologies, Inc.
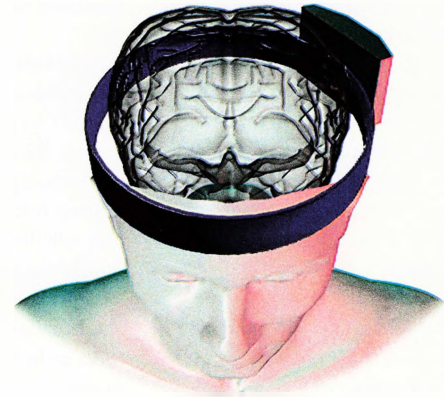
ANTHROPOLOGY WEBMUSEUM OF MEXICO

The goal of this project was to put the Mexican Anthropology Museum on the World Wide Web so it can be visited by anyone anywhere. The information (in Spanish and English) is structured so that it is fun and interesting, and it provides different ways for online visitors to leave their marks.

There are two main tours: by layout of the museum and by prehispanic culture, including additional stories such as Legends of the Ghosts of the Museum, Communities Then and Now, and Aztec News. There are many links among the various topics. All aspects of development of this project have been documented so that others can duplicate it, and the programming code is freely available for distribution.

In establishing a precedent and defining a path for putting parts of a country's culture on the net, the producers of Anthropology WebMuseum of Mexico hope that other countries with limited resources can realize the potential of this medium. The opportunity to visit a museum from any classroom or home in the world opens a vast array of possibilities for learning and understanding other cultures.

Arnulfo Zepeda Navratil
Banamex
Mexico City, Mexico
+52.5.725.1535
+52.5.725.1050 fax
azepeda@spin.com.mx

Concept and Implementation
Arnulfo Zepeda Navratil
Banamex

Arturo Bejar Solar
Electric Communities

Content and Research
Karina Rebeca Durand Velasco
Museo Nacional de Antropologia

Implementation
Eduardo Llaguno Velasco
Softtek

Jorge Francisco Puente V.
Dyncorp

J. Benjamin Alvarez M.
Multimedia & Computing Services

Jose Ivan Cervantes R.

Salvador Ayala Mungia

Graphic Design
Mario Vicencio Montiel

Jose Luis Bravo

Carlos Alberto Guzman
Centro Inv. Diseño Industrial
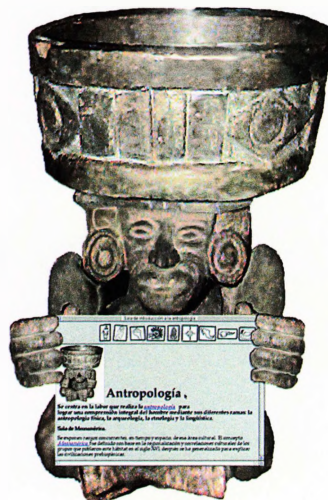
The ArtAIDS LINK is an art and communications project that uses the Internet and World Wide Web browsing tools as a medium for new forms of collaboration and interaction. The supported art forms are limited only by the availability of compatible file formats.

Art communities, which have traditionally not been part of a large-scale, international networked computing culture, are now accessing and exploiting the potential of fast communication links, developing new ways to collaborate, and forming new experiences, opportunities, expressions, and responses.

The ArtAIDS LINK's digital canvas promotes sharing and participation, wherever there is Internet access. A central theme of the LINK is the response to AIDS, and everyone is encouraged to explore and apply creative inspiration to this worldwide crisis. Art and design educators are already using the ArtAIDS galleries to extend current patterns of learning and doing.

Visitors to the ArtAIDS LINK galleries can browse exhibits, download images, keep images for modification, and upload works for subsequent exhibition. Most of the LINK pages are dynamically generated. They provide opportunities to offer feedback and add additional art-site links. The gallery site is a World Wide Web server that deals with file conversion routines for thumbnails. Exhibits can be located at many sites around the world for retrieval by ftp or other means, depending on user location.

The LINK galleries promote a new way of viewing art and contributing to public art. They create a new forum for discussion and expand, explore, and study genealogical, visual, and emotional relationships.

Andrew Nimmo

Department of Computer Science
Queen Mary and Westfield
College
University of London
Mile End Road
London E1 4NS United Kingdom
+44.171.975.5254
+44.181.980.6533 fax
A.D.Nimmo@dcs.qmw.ac.uk
http://artaids.dcs.qmw.ac.
uk.8001/

Contributors

Andrew Nimmo
Sylvia Wilbur
Gee-Kay Wong
Mike Hopkins
Queen Mary and Westfield
College, University of London

Peter Ride
Cambridge Darkroom Gallery

Geoff Henning
Crusaid

John Clancy
Chelsea College of Art and
Design, The London Institute

Nina Pope
Sheep T. Iconoclast
The Bartlett School of Architecture
University College London

Q Love
Rourke Associates

ChainReaction is a worldwide collaborative art project that involves digital image manipulation and networked integration of visual communication and the visual environment. Participants from around the world collaborate with SIGGRAPH 95 attendees to create a nonlinear progression of digital images. Using the World Wide Web and network technologies, they collaborate to build a structure of images that reflects the multiplicity of the experience.

Background

ChainReaction is based on the successful ChainArt Project (1993), Digital Journey Project (1994), and Diverse Paths Project (1995). Each of these projects utilized the Internet as a means of collaborative creation and exchange of visual imagery. They focused on inclusion and development of a collective experience, and demonstrated how the creative process is altered by digital communication and visual collaboration. ChainReaction focuses on individual creative decisions and maximizes the integration of digital input devices and networked visual communication, thus enhancing the creative possibilities.

Process

The project began as a complex World Wide Web interface that included numerous

starter images and interactive methods for inputting information. Once the project was underway, participants could download an image, manipulate it, and then upload it back to the ftp site. Using scripting, the image was then connected back to the chain, displayed as a link to the image from which it began, and made available for viewing and manipulation on the WWW. Each time an image was manipulated, it created another link in the chain. As the chain progressed, the images continued to branch off and create a more diverse selection of images to manipulate.

SIGGRAPH 95

For SIGGRAPH 95, ChainReaction participants can choose from a variety of digital input devices to include their visual environment in their expressive reactions to other participants' images. They can manipulate another person's image by drawing on it using a digital tablet, incorporating video recorded at SIGGRAPH 95, or capturing images from a CU-SeeMe video session. They can also scan in images or capture digital images using a digital camera.

CU-SeeMe sessions involving participants from around the world and video performance events are captured for inclusion on the WWW ChainReaction site. Some images become part of other images while other CU-SeeMe images become part of pages, visually documenting the individuals who manipulated the image.

Participants from locations around the world can collaborate with SIGGRAPH 95 attendees in manipulating images and communicating via CU-SeeMe and email. Because hardware, software, and networking capabilities vary from location to location, involvement in the project ranges from ftping manipulated images to networked video performances merged into the manipulated images and documented on the WWW site.

This project is a journey into the creative process, and the results document a collective experience that can only be achieved through international digital networking technology and expressive responses to digital images on the network.

Bonnie Mitchell

Art Media Studies – Computer Graphics
College of Visual and Performing Arts
Syracuse University
Syracuse, New York 13244 USA
+1.315.443.1267
+1.315.443.1303 fax
bonniem@mailbox.syr.edu
http://ziris.syr.edu/

Contributors

Melody dos Santos
Drew Farris
Heather Elliott
Wayne Fidler
Joshua Jones
Scott Mager
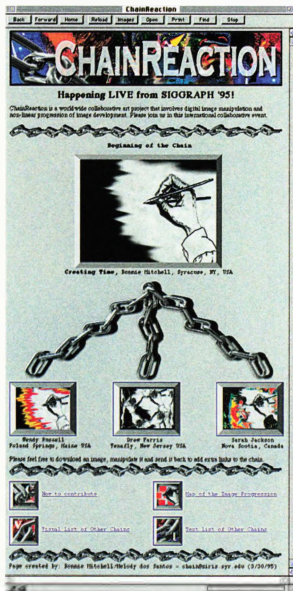
Even though computer art is 30 years old, computer artists are still fighting a guerilla struggle to gain acceptance in the established fine art community and within our own broad-spectrum technology communities. The Guerrilla Gallery is a working Atelier that provides a rich interactive experience for works-on-paper artists and the entire SIGGRAPH community.

The purpose of the Guerrilla Gallery is two-fold. First, it offers members of the art and science communities a unique opportunity to experiment with the complicated process of printing images from their own files on a variety of printers, free of charge. The gallery features a fully equipped imaging studio where artists can produce digital prints.

The salon area of the gallery, Common Ground, also serves as a meeting place and crossroads, where SIGGRAPH 95 attendees from all disciplines can exchange ideas on all aspects of imaging. This exchange is intended to enhance our understanding and appreciation of one another. Works-on-paper artists exhibit their prints in Common Ground, talk with manufac-

turers, and hold "Artists Talk on Art" sessions, which are open to anyone who wishes to attend.

The atelier is supervised by Jon Cone, founder of Cone Editions Press, who offers his services as master printer.

Pat Johnson
patjoh@aol.com
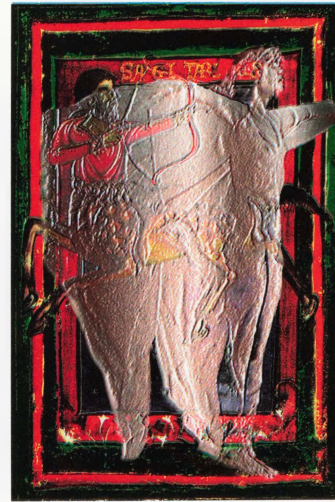
Motion Phone is an experiment in pure visual communication. Users sit at workstations that display digital animation loops and use a tablet to choose colors and drawing tools from palettes on the screen. As the users draw, the speeds and locations of their marks are entered into the animation loop. Additional marks are added into the same animation loop, allowing users to sequentially layer multiple rhythms of form and color. The non-modal interface allows users to simultaneously modify shape, size, and color by varying the pressure on the tablet, pressing keys, and using the surrounding interface. Users quickly learn to recognize and control the subtleties of motion in their hand-gestures – information that is normally lost or hidden by most computer art and animation tools.

When one animator decides to interact with other users, a connection is established by simply clicking on an icon. Then two people can communicate using motion, form and color in an unpredictable and sometimes startling interaction. Since the animators' marks are preserved over time, there is a sense of history to their dialogue. The resulting communication can be chaotic or graceful, but it is always engaging.

The tools provided in Motion Phone are primarily two-dimensional: lines, circles, polygons. Since the animation is stored in a display list, each viewer can translate over the infinite plane of interaction, or zoom into or out of parts. With more than two users, this space becomes an immense landscape upon which many dialogues are taking place.

Scott Snibbe

1616 East Howell, Apartment 205
Seattle, Washington 98122 USA
+1.206.386.8836
+1.206.343.4240 fax
ssnibbe@adobe.com

Contributors

Scott Snibbe
Adobe Systems Incorporated
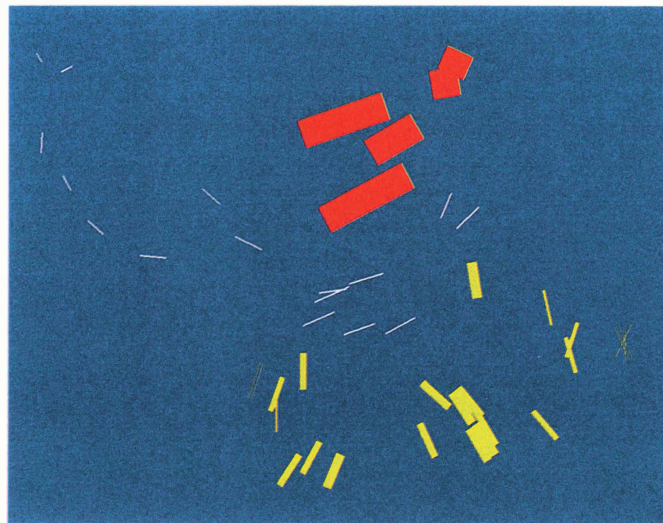
A s we move toward the end of the millennium, museums are rapidly changing. New communities must be addressed, whether they are disenfranchised by economic circumstances or geographic limitations. Through World Wide Web tools, The California Museum of Photography integrates technology, social history, and contemporary art, and provides public opportunities for interaction on several levels.

The museum uses Apple's Library of Tomorrow program to develop liaisons with classroom teachers, contemporary artists, and the general public. Projects include:

- The VidKids program, partially supported by a grant from the National Endowment for the Arts, in which students use 8 mm video to produce animation, sound, and imaging experiments for the World Wide Web and more direct wide-area networks.

- A museum-wide ethernet network that offers visitors an opportunity to browse Internet-based art works.

- Direct connections between classrooms and the museum through CalREN's Frame Relay experiment with a consortium of Los Angeles schools.

- Forms-based delivery of documents and images that the public can author as a direct feedback technique.

Edward W. Earle
Associate Director
California Museum of Photography
University of California Riverside
+1.909.787.4787
+1.909.787.4797 fax
edward.earle@ucr.edu
http://cmpl.ucr.edu

Contributors

Associate Director
Edward W. Earle

Museum Director
Jonathan Green

Curator of Exhibitions
Kevin Jon Boyle

Museum Educator
Lori Fiacco

Robert Price
Hoffer Elementary School
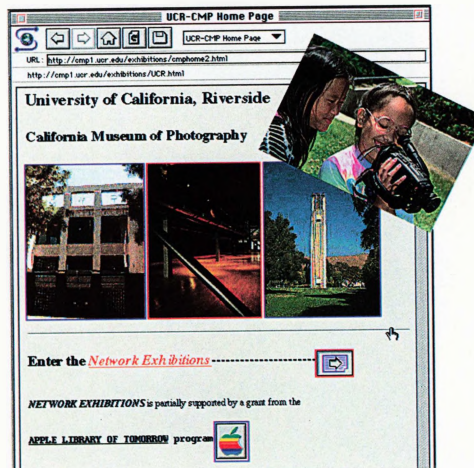
Ylem/Artists Using Science & Technology now has an art space on the World Wide Web: Ylem's Art on the Edge. It ranges in media from artists who do immersive environments, interactive multimedia, and music, to essays on evolving aesthetic theory.

Ylem's Art on the Edge uses the World Wide Web to decentralize curating, displaying, experiencing, and eventually, making art within the global community. The non-hierarchical nature of web technology will certainly loosen traditional art institutions' control of even the definition of art by providing a "by-pass" link between the artist and the "user." The frontier spirit of the web will no doubt push the envelope in the areas of human sensory perception and multi-cultural vision. To facilitate this evolution, Ylem is acting as a WWW host for artists who wish to contribute web pages.

http://www.ylem.org

Beverly Reiser
President
Ylem/Artists Using Science & Technology
6979 Exeter Drive
Oakland, California 94611 USA
Beverly@idiom.com

Contributors

Art Pages
Annette Loudon
Beverly Reiser
Larry Shaw
Gary Zellerbach

Interactive Media
Beverly Reiser
Bill Fleming
Hans Reiser
Kimberley Edwards
Life on a Slice

Music
Craig Harris

Robotic Sculpture
Ken Rinaldo

Large-scale Site-specific Sculpture
Anita Margrill

Digital Photography
Annette Loudon

Digital Photography
Diane Fenster

Interactive Multimedia
Lucia Grossberger Morales

Interactive Multimedia
Steve Wilson

2D Graphics
Paul Brown

Robotic Sculpture
Jim Pallas

Multi-sensory Installations
Barbara Lee

Web Art
Ranjit Bhatnagar

Digital Photography
Marius Johnston

LIFE ON A SLICE
.....METAPHORICAL REALITIES

INTERACTIVE INSTALLATIONS USING
SOUND, VIDEO, AND COMPUTER GRAPHICS
by BEVERLY REISER & HANS REISER
music by BILL FLEMING
performances by
KIMBERLY EDWARDS
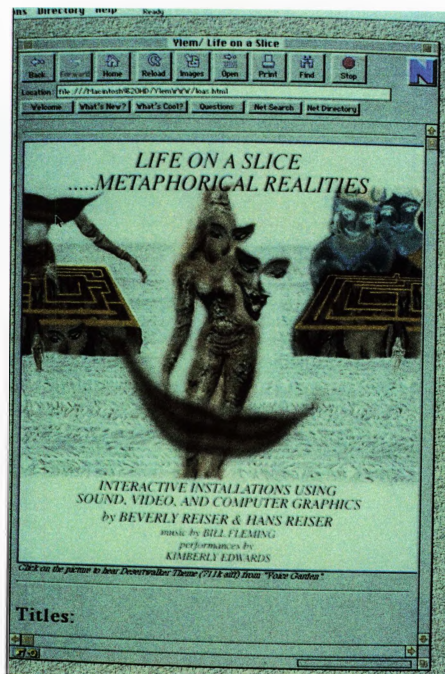
Community is a central tenet for those who have used the computer to transform art, culture, commerce and communication in the years since SIGGRAPH was founded. Yet there has never been a unified community of makers and users. Instead, we are "communities," satellites of interest groups and sub-specialties, employing local dialects so thick that even though we claim to speak a common language of bits and bytes, most of our conversations are impenetrable to all but a select few. Thus, it is cause for wonder when the technologies that so often splinter our attentions instead bring about new unities. We concentrate here on the conjoining of text and image because this involves a transformation not only of the form of on-line environments, but also of their very purposes.

Consider two groups of people: those who communicate with digital graphics and media, and those who use text-based networking to bring about interaction. This is not to say that graphics programmers did not have email accounts or that IRC and netnews users did not download .gif images. Though substantial numbers were card-carrying members of both groups, there were many who belonged to one or the other, each with its own history, emphasis, and argot. We speak in the past tense, because with the recent advent of the World Wide Web, these two groups have effectively merged. Designers are now creating home pages that compress effectively for transmission, and net surfers are incorporating graphics into on-line MOOs. Interactive Communities celebrates this fusion, showcasing those projects that combine the instant access and interlinking of on-line environments with the visual richness and iconographic quality of computer imaging.

Yet we have to ensure that the specificities of each of the communities – what drew people to them in the first place – are not lost in the rush. What happens to the growing sophistication and nuance of digital images as we subject them to the compression algorithms required to pipe them around the globe? And, perhaps even more important, do we sacrifice the egalitarian community of text, which has defied our usual social hierarchies, to the requirements of "professional" imagemaking? The late critic Craig Owens once defined the essence of postmodern art as "the eruption of language into the field of the visual." In a cultural turnabout, the Web demonstrates an invasion of the textual by the order of the image. Lasting communities are built by a responsible and empowered citizenry. We must ensure that images flow from many to many – like the Internet in its text-only days – and not only from the powerful few to the multitudes (the model offered by contemporary mass media).

Peter Lunenfeld
Art Center College of Design

Ken Goldberg
University of Southern California

computer animation festival electronic theatre

Frank Foster and Joan Collins
Co-Chairs
Computer Animation Festival/
Electronic Theatre

Welcome to the SIGGRAPH 95 Computer Animation Festival / Electronic Theatre

At SIGGRAPH 95, the Computer Animation Festival has expanded to three screening rooms at the Los Angeles Convention Center in addition to four showings of the Electronic Theatre at the historic Shrine Auditorium. This year, for the very first time, the general public also has an opportunity to see the Electronic Theatre in a special fifth screening after the SIGGRAPH conference.

For the Electronic Theatre, the jury selected about 70 computer-animated pieces from a large collection of international entries. Here computer animation can be viewed under the best conditions in a variety of formats, including 35mm, 70mm motion picture projection, and high-quality video with surround sound multi-channel audio.

This year, the Electronic Theatre also features live music accompaniment for the custom opening animation. The original music is performed by Paul Haslinger, formerly of Tangerine Dream and the composer of the opening animation for SIGGRAPH 90. He is joined by Oscar-nominated sound designer, Scott Martin Gershin.

At the Computer Animation Festival Screening Rooms, SIGGRAPH 95 attendees can view hundreds of animations in a relaxed environment only a few steps away from the Art Gallery and the Exhibition.

COMPUTER ANIMATION FESTIVAL/ELECTRONIC THEATRE JURY

James F. Blinn
California Institute of Technology

Larry Cuba
Independent Filmmaker

David Em
Digital Artist

Alvy Ray Smith
Microsoft Corporation

COMPUTER ANIMATION FESTIVAL/ELECTRONIC THEATRE COMMITTEE

Marketing Consultant
Adrian Turcotte
Odyssey Visual Design

Music Research Consultant
Larry Heller

Computer Animation Festival Director, Theatre A
Steve Churchill
Odyssey Visual Design

Computer Animation Festival Director, Theatre B
Ed Arroyo
Second Genesis/Mindset

Computer Animation Festival Director, Theatre C
Andrea Sholer
Sony Pictures Imageworks

Electronic Theatre Music Director
Paul Haslinger
Forefront Music Network

Electronic Theatre Audio Designer
Scott Martin Gershin
Soundelux Media Labs

Electronic Theatre 35mm Film Editor/Writer
Ladd McPartland

Large Format Motion Picture Consultants
Charlotte Huggins
Sony Pictures Imageworks
Christopher Reyna
Imagica

Electronic Theatre Previsualization Architect
Michael Burns
Sony Pictures Entertainment

Digital Pre-Press Consultant
Brad Mooberry
Ad Dimensions, Inc.

Multimedia CD-ROM Consultant
Richard Sher
Virgin Interactive

CD-ROM Compression
Joe Munkeby
Bill Kunin
Michael Sanchez
Ara Tserunian
Sony Pictures Imageworks

Administrative Assistant
Lorie A. Kellogg

CONTACT
Frank Foster

Sony Pictures Imageworks
Astaire Building South
Room 2610
10202 West Washington Boulevard
Culver City, California 90232
USA
+1.310.280.7603
+1.310.280.4397 fax
foster@siggraph.org

THE END

A narrative exercise in subversion, pretension, furtive montage, and mixed metaphors.
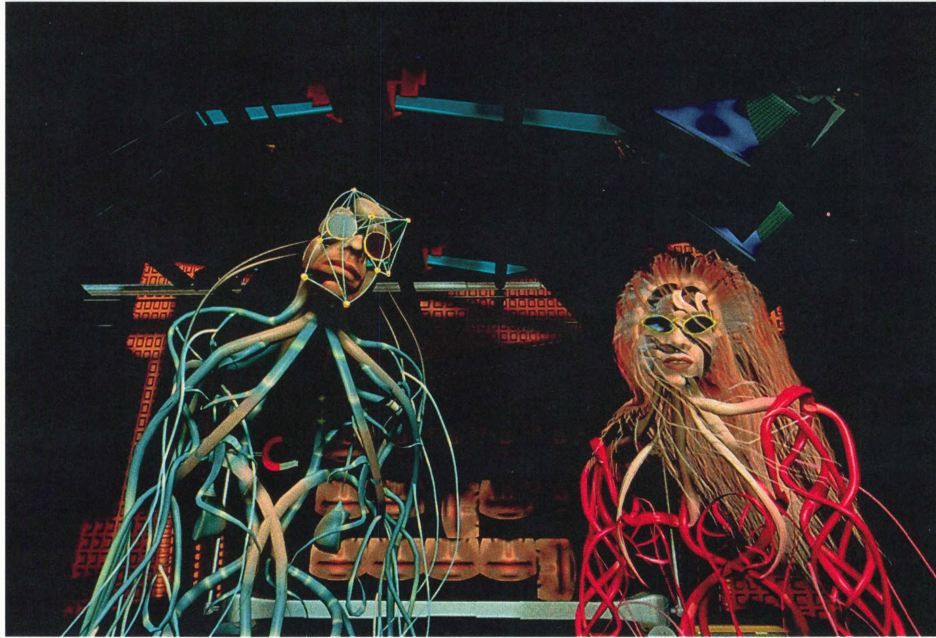
Chris Landreth
Alias/Wavefront
110 Richmond Street East
Toronto, Ontario M5C 1P1
CANADA
+1.416.362.9181 x384
landreth@alias.com

Directed and animated by: Chris Landreth
Sound and original music: Robin Bargar
Written by: Chris Landreth and Robin Bargar

Voices: Gina Clayton, Jeff Hirschfield
Dancers: Wynne Fricke, Bob Zehr
Produced at Alias/Wavefront
Animators: Jeff Bell, Duncan Brinsmead, Kevin Picott
Modelers: Ian Hayden, Don Harper, Chuck Tappan, Ming Mah, Gary Mundell
Offline editing: Tom Burns (with Eric Moncrieff and Daniel Roizman)

Production Coordinator: Andy Jones
Render Coordinators: Bob Prentice, Joe Spampinato
Motion capture produced at Windlight Studios
Chief Motion Capture Animator: Joan Staveley
Online editing at YTV Studios
Editor: Tony Meone
Sound integration at ICE Communications
Soundtrack Production Coordinator: Simon Edwards

Animation software: Alias Power Animator V7.0
Sound software produced at: National Center for Supercomputing Applications
Special Thanks to: Kevin Tureski, Venu Venugopal, Rob Burgess, Scott Dyer, Pam Lehm, Jeff Faust, Tom Rudman

This video showcases visualization techniques applied to the National Library of Medicine's Visible Human Male Dataset, created by radiological imaging and digital photography of a complete male cadaver at 1mm intervals. The anatomical data, true-color volumetric rendering, and future applications are presented.

John Clyne
National Center for Atmospheric Research
1850 Table Mesa Drive
Boulder, Colorado 80303
USA
+1.303.497.1236
clyne@ncar.ucar.edu

Produced by: NCAR's Scientific
   Computing Division
Principal Investigators: Victor
   M. Spitzer, David G.
   Whitlock,
Visualization and Production:
   Karl D. Reinig, Helen L.
   Pelster, Charles G. Rush,
   John Clyne, Don Middleton
Cutters: Timothy J. Butzer,
   Martha Ann Pelster
Photography: Jim Heath
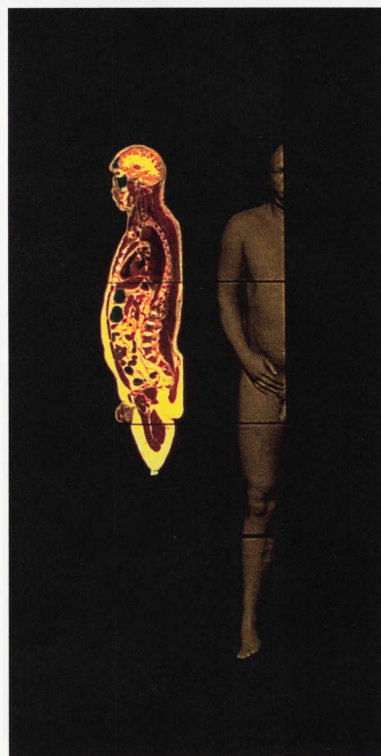
The Visible Human Male Dataset is brought to you by the University of Colorado Health Sciences Center, Center for Human Simulation, with help from the Visualization and Digital Information Group at the National Center for Atmospheric Research's Scientific Computing Division. Special thanks to the National Library of Medicine.

TOY STORY

Toy Story, the first computer-animated feature film, is a buddy picture concerning two rival toys. In this clip, Woody, the favorite cowboy toy of his owner, Andy, deploys the green army men to reconnoiter the birthday party where Buzz Lightyear, the spaceman action figure, will arrive as a gift.

Monica Corbin
Pixar & Walt Disney Feature
Animation
1001 West Cutting Boulevard
Richmond, California 94804
USA
+1.510.412.3629
monica@pixar.com

Walt Disney Pictures presents a
   Pixar production
Director: John Lasseter
Producers: Ralph Guggenheim,
   Bonnie Arnold
Technical Director:
   William T. Reeves

BONSAI

This animation demonstrates a growth model of a tree with the following growth regulations: self-pruning, heliotropism, geotropism, apical dominance, suppression of lateral shoots, dormancy break, and change in leadership.

Norishige Chiba
Department of Computer Science
Faculty of Engineering
Iwate University
Morioka 020
JAPAN
+81.196.21.6465
nchiba@cis.iwate-u.ac.jp

Produced by:
    Norishige Chiba,
    Ken Ohshida

UTOPIA is from a multimedia installation that explores the environment and the contemporary urban crisis. The core of the piece is a CD-Interactive video game hosted by performance artist Rachel Rosenthal. The viewer is asked to make a series of choices by using a gun as a dramatic selection device.

Max Almy
Magika
3454 Standish Drive
Encino, California 91436
USA
+1.818.789.8540
maxalmy@aol.com

Written, directed, and
    produced by: Max Almy &
    Teri Yarbrow
CD-I interactive design &
    programming: Chris Angelli
Performance: Rachel Rosenthal
Music: Mark Ream
Editing: Max Almy, Teri
    Yarbrow, Marco Bacich,
    Kevin Prendiville, Bill Lae,
    Todd Brunelle

CLOCK -
SCI-FI CHANNEL
STATION ID

An incredible metamorphosis of a beautiful old-fashioned clock into an ugly and evil creature that threatens to swallow us. Within, we discover the Sci-Fi Channel space and fall into the planet logo. By focusing on the inner mystery of science fiction, and contrasting traditional beauty with evil ugliness, we hint at the inescapable power of time.

Edward Bakst

160 West 96th Street #9n
New York, New York 10025
USA
+1.212.666.2579

Client: Sci-Fi Channel
Designer/Director:
    Edward Bakst
Executive Producer:
    Paula Brown
Producer: Ken Krupka
CG Facility: Movida 3d
CG Animator: Anthony Huerta
TD: Stephane Simal
Online Producer: Ben Stassen
Production Manager:
    Caroline Van Iseghem
Sound Design: Cliff Schwartz
    Prod., USA

A moving impressionist-style painting that takes the viewer through four seasons as the story unfolds. This completely new look is obtained by applying texture maps to 3D computer models and incorporating many different painting levels. The initial impression is that the scene was created using traditional cel animation, until the viewer realizes that there is no boiling, and the landscape is 3D.

Susanna Racke

601FX
34 Great Pulteney Street
London, WIR 3DE
UNITED KINGDOM
+44.171.439.2730
100542.2563@compuserve.com

Computer Animation: 601FX
Director/Designer: Pat Gavin
Agency: Ogilvy & Mather
Agency Creative/Copywriter:
    Neil French
Production Company:
    Hibbert Ralph

THE SHADOWS
OF ALEXANDRIA

This piece describes how
Eratosthenes was able to cal-
culate the size of the Earth by
measuring shadows.

Beau Janzen
Kentucky Educational Television
600 Cooper Drive
Lexington, Kentucky 40502
USA
+1.606.258.7158

Produced by:
 Kentucky Educational
 Television
Written and animated by:
 Beau Janzen
Read by: Tina Janzen
Edited by: Esther Reed

BONFIRE

This animation demonstrates the
particle-based behavioral
model for simulation flames,
which works in a simulated
"3D vortex field," and an effi-
cient rendering method that
blends predefined basis
images so as to synthesize an
image of a scene including
volume light sources – flames,
for example.

Norishige Chiba
Department of Computer Science
Faculty of Engineering
Iwate University
Morioka 020
JAPAN
+81.196.21.6465
nchiba@cis.iwate-u.ac.jp

Produced by:
 Norishige Chiba,
 Jun-ya Takahashi
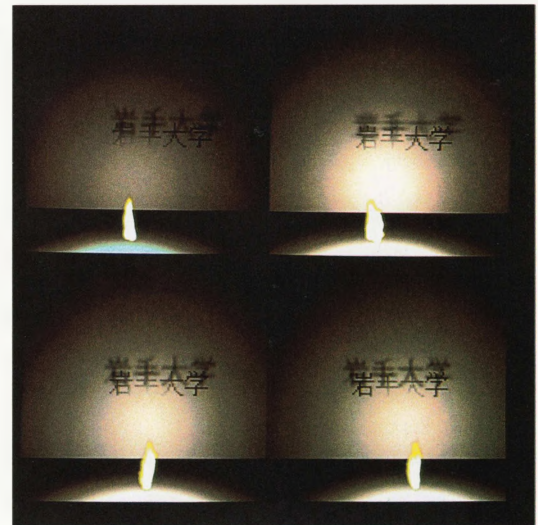
JOE & BASKET
MOSTLY SPORTS

Joe & Basket is a 100-percent 3D generated short film. The story line and look is inspired by 1950's cartoons like Loony Tunes. The main challenge, and fun, was developing characters with a high level of likability and warmth.

Martinique Spans
Spans & Partner GmbH
Am Sandtorkai 1
20457 Hamburg
GERMANY
+49.40.3749670

Producers: Spans & Partner
    GmbH
Director & Animator:
    Peter Spans
Animators: Sabine Lang,
    Carola Rüppel, Ismail Acar
Music: Music Makers,
    Jan Peter Pflug
Sound FX: Krüger & Krüger

WILLIAM
GIBSON'S
CYBERSPACE
FROM THE
MOVIE JOHNNY
MNEMONIC
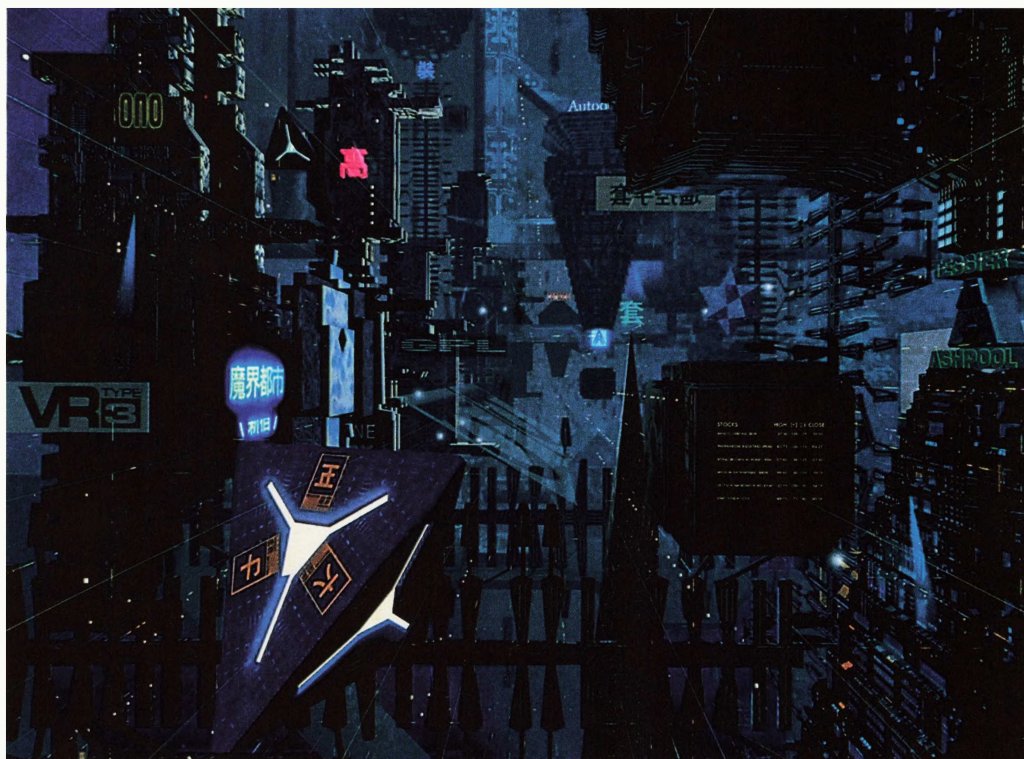
George Merkert
Sony Pictures Imageworks
10202 West Washington
Boulevard
Culver City, California 90232
USA
+1.310.280.7685
george@spimageworks.com

Producers: George Merkert,
   John Nelson
Designed and Produced by
   Sony Pictures Imageworks
Designer/ Visual Effects
   Supervisor: John Nelson
Visual Effects Producer:
   George Merkert
Co-Designer/ Art Director:
   Jamie Rama

Animators: Matthew Hausle,
   David Worman,
   Brummbaer, Glenn
   Campbell, Rachel Nicoll,
   Dave Thompson, Tim Miller,
   Karen Logan, Shinichi
   Yoshimoto, Stephen Kramer
Visual Effects Coordinator:
   Cat Chapman, Ryan Berg,
   Anthony Ceccomancini

Software Engineer:
   Joe Munkeby
Film Recorders: Dan Candela,
   John Strauss, Dennis Webb,
   Steffany Hannan, Tom
   Hendrickson
Executive Producer: Bill Birrell
Computer Graphics
   Department Head:
   Frank Foster
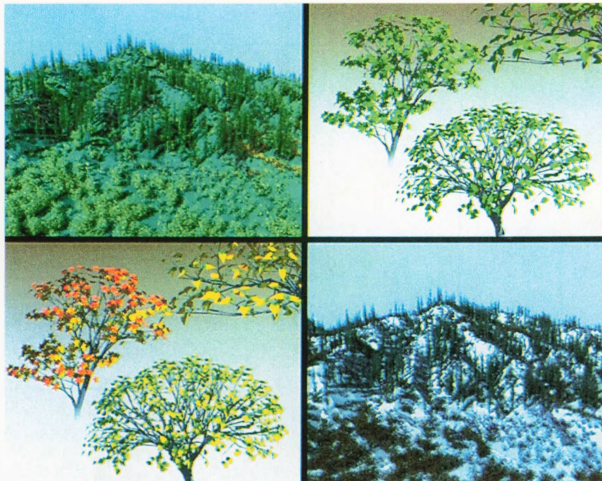
SEASONAL COLORS

This animation demonstrates the following techniques: improved volume rendering for numerous volume data of seasonal trees based on simulated vegetation, motion simulation for leaf arrangement based on simulated phototropism of leaves, and visual simulation of autumn color evolution based on a simulated aging process and an estimated light environment.

Norishige Chiba
Department of Computer Science
Faculty of Engineering
Iwate University
Morioka 020
JAPAN
+81.196.21.6465
nchiba@cis.iwate-u.ac.jp

Produced by:
    Norishige Chiba, Junya
    Hosokawa, Ken Ohshida,
    Kazunobu Muraoka

SUN PRINCESS

A 15-minute computer-generated film was requested by Princess Cruises to show off a new superliner that was still under construction. They wanted their Vice Presidents of Marketing to appear as cyber characters to host the virtual ship. And they needed all this, in high quality production, in 12 weeks.

Peter Conn
Homer & Associates
1420 North Beachwood Drive
Hollywood, California 90028
USA
+1.213.462.4710
homerinc@netcom.com

Director: Peter Conn
Animators: Jackie Gordon,
    Michael Janke, Dominique
    Olivier, Florent Wendling,
    Kelly Wilcox

Arnie, the blustering, brow-beating dog, is continually out-smarted by a parasitic flea, Birnie. Tired of Birnie using his body as a bed and breakfast, Arnie tries to put an end to Birnie, over and over again. Windlight uses motion capture to block out the overall movement, then animates on top of that data to achieve the more cartoony effects and motion expected of character animation. The result is a hybrid of cartoon gags and subtle human movements.

Pam Lehn
Windlight Studios Inc.
708 North 1st Street
Suite CR100
Minneapolis, Minnesota 55401
USA
+1.612.339.9091
pam@windlight.com

Producer:
    Windlight Studios, Inc.
Creative Director/Writer:
    Don Bajus
Director: David Novak
Technical Directors: Scott Dyer,
    Eric Flaherty
Principal animation: Ron Pitts,
    Joan Staveley

Lip sync & facial animation:
    Don Bajus, Evan Olson
Producer: Pam Lehn
Additional animation: Don
    Bajus, Eric Flaherty,
    Shannon Gilley, Julie Nelson
Models: Evan Olson, Joan
    Staveley
Color & lighting: Dave Novak
Software: Jeff Faust, Scott
    Dyer, Eric Flaherty, Rob
    McLean
Sound design:The Echo Boys
Production assistance: Kelly
    McManus, Jean Moy
Motion Capture Technical
    Director: Eric Flaherty
Motion Talents: Don Bajus,
    Stephan Geras, Ron Pitts,
    Joan Staveley
Hardware: Silicon Graphics,
    Flock of Birds
Software: Windlight
    Proprietary, Alias Power
    Animator
Special thanks: Alias Research

This is a simulated electron microscope view of an infected leukocyte cell bursting and releasing millions of Motaba viruses. As one virus burrows, we see the rest of the infectious swarm attacking healthy liver cells. This scene was created by VIFX, animated with PRISMS and rendered with RenderMan.

Gene Kozicki
VIFX
533 McConnell Avenue
Los Angeles, California 90066
USA
+1.310.822.8872
gene@vifx.com

Producer: Richard Hollander
Supervisor: Antoine Durr
Director of Software:
   Andy Kopra
3D Animators: Eric Jennings,
   Ira Shain
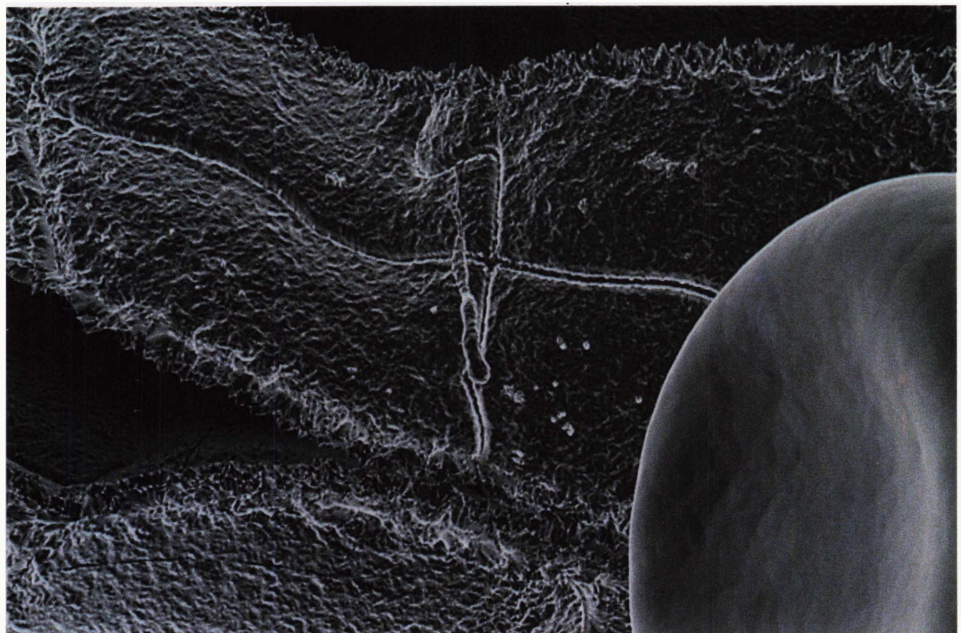
Panini Stickers, based on the absurdist performance art of [THE], Ed Harkins and Phil Larson, integrates live-action video material, Amiga and Macintosh image processing of old black-and-white films, SGI/Wavefront animation, and Ampex Digital Optics to composite the layers. The final edit was realized using a Macintosh.

Vibeke Sorensen
University of Southern California
2322-D La Costa Avenue
Carlsbad, California 92009
USA
+1.213.740.7595
vibeke@usc.edu

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Tom Williams
Industrial Light & Magic
P.O. Box 2459
San Rafael, California 94912
USA
+1.415.258.2000

Digital Character Supervisor:
Dennis Muren
ASC Animation Director:
Eric Armstrong
Digital Character
Co-Supervisor:
Stephan Fangmeier
Digital Character Producer:
Janet Healy
Visual Effects Plate Supervisor:
Scott Farrar
Supervising Digital Effects
Artists: Kevin Rafferty,
Thomas L. Hutchinson, John
Andrew Berton, Jr., Henry
La Bounta, Joe Letteri
Supervising Character
Animators: Mark Anthony
Austin, Tom "Two Hands"
Bertino, Miguel A. Fuertes,
Jeffery B. Light, Doug Smith,
James R.Tooley
Character Animators: Philip
Edward Alexy, David
Rockhed Andrews, Chris
Armstrong, Rich Arons,
Linda Bel, David Byers
Brown, Susan Campbell,
Jerry Yu Ching, Bruce Dahl,
Lou Dellarosa, Bill Fletcher,
Paul J. Griffin, Steve
Fireplug Hunter, Daniel
Jeanette, Ken Satchel King,
Peter Lepeniotis, Fabio
Lignini, Maryann Malcomb,
Phil Robinson, Erik Chr.
Schmidt, Trish Schutz,
Andrea Simonti, Oskar
Urrretabizkaia, Jeffrey J.
Varab, Colin White
Character Design Supervisor:
Dave Carson

Digital Character Modeling
Supervisors: Kyle Odermatt,
Wade Howie
Digital Effects Artists: Mike
Amron, Barry Armour, Kevin
Barnhill, Michael Bauer,
Marc A. Cooper, Mitch
Johnny
CG Deoudes: Gerald
Gutschmidt, Roger Guyett,
Christophe Hery, Greg
NeyHi Killmaster, Russel
Koonce, Robert Marinic,
Stuart Maschwitz, Erik
Mattson, Michael McNeil,
Curt I. Miyashiro, Kenneth
Nielsen, Tony Plett, Ben
Snow, Lisa Suzuki, Tim
Waddy
Digital Modelers: Matthew
Hendershot, Bruce Buckley,
Paul Theren
Jiggle Software Development:
Michael Dean Ludlam
Enveloping Supervisor: Amelia
Chenoweth
Digital Paint and Roto
Supervisor: Sandy Houston
Digital Paint and Roto Artists:
Donna Ashley Beard, David
Deuber, Loring Doyle,
Bridget Maria Goodman,
Drew Klausner, Marshall
Richard Krasser, Kevin
Wilmering
3D Camera Matchmove
Supervisor: Jeff Doran
3D Camera Matchmove
Artists: Jon Alexander,
Lanny Cermak, Terry
Chostner, Selwyn Eddy III,
James Hagedorn, Dave
Hanks, Keith Johnson
Digital Texturing Paint Artist:
Susan Ross
Digital Character
Coordinators: Vicki L. Engel,
Michael J. Halsted
Plate Photography
Coordinator: Penny Runge

Plate Photography Camera
Assistant: Mark Gutterud
Visual Effects Art Director:
TyRuben Ellingson
Color Timing Supervisor:
Kenneth Smith
Visual Effects Editor:
Michael Gleason
CG Software Supervisor:
Eric Enderton
Software Engineers: Zoran
Kacic-Alesic, John Lewis
Motion Capture Supervisor:
Lincoln Hu
Motion Capture Operator:
Carl Miller
Motion Capture Artist: Greta
Rose Bart
Motion Capture Video
Engineer: Clark Higgins
Character Sculptor:
Richard Miller
Digital Matte Artist:
Eric Chauvin
Production Assistants:
Alexandra Altrocchi,
Megan I. Carson
Animation Production
Assistant: Christine Owens
CG Production Assistants:
Marla Selhorn, Kay Rough
Scanning Supervisor:
Joshua Pines
Scanning Operators: Randal
K. Bean, Mike Ellis, George
Gambetta, John Whisnant
Video Engineering: Gary
Meyer, Dan Large
Digital Continuity Editor:
Kerie Kimbrell
Visual Effects Assistant Editor:
Greg Hyman
Projectionist: Timothy A.
Greenwood
Negative Cutter: Doug Jones
Electronic Editorial Operators:
Megan Egan Serafini,
Angela Leaper
CG Technical Assistant
Supervisor: Patrick Neary

CG Technical Assistants:
Jeffrey Benedict, Edwin G.
Dunkley, Russel Earl, Raul C.
Essig, David Manos Morris,
Patrice Saenz
Computer System Engineers:
Ken Beyer, Bob Brophy
Digital Frame Touch-up: Susan
Goldsmith, Heidi Zabit
Line-up: James Lim, Tim
Geideman
Storyboard Artist: George Hull
Still Photographer:
David Owen
Movement Instructor:
Dan Chumley
Production Services:
Paula Karsh
Courier Coordinator:
John Blausey
Production Accountant:
Pamela J. Kaye
Scanning Coordinator: Lisa
Van Cott
Electronic Editorial
Coordinator: Lisa Vaughn
CG Technical Staff: Fred
Meyers, Andy Hendrickson,
Christian Rouet
CG Support Staff: Nancy Jill
Luckoff, Suzie Vissitzky
Tooley
CG Staff: Gail Currey, John
Ellis, Paul Grimshaw, Doug
Kay, Ken Maruyama
Industrial Light & Magic Senior
Staff: Tom Williams, Jeff
Mann, Patricia Blau, Jim
Morris

ROLLING STONE

Rolling Stone is about a race between three primitive shapes. If you have ever seen a child in a tire rolling down a hill ... well, this in fact is what the people of the stone age did. Only the man with the properly shaped wheel will win the race.

Tim Cheung
Pratt Institute
160 East 91st Street, Apt. 6J
New York, New York 10128
USA
+1.212.687.4000
tim@mte.com

Produced by: Tim Cheung
Music by: Michael Dicomo,
    Tim Cheung
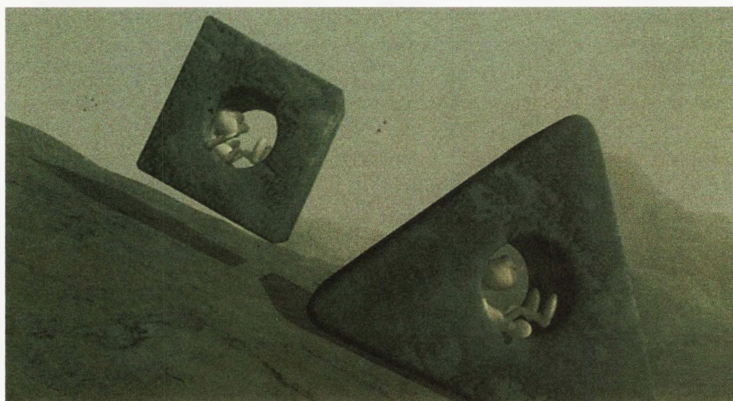
MONOPOLY
PLASTIC PEOPLE

Plastic People marks the 60th anniversary of Parker Brothers' legendary board game, Monopoly. While each aspect of the spot reveals exceptional attention to detail, the facial animation is something of a breakthrough in 3D animation techniques. A unique in-house Lamb & Company animation system was used to create the interesting facial movements of the plastic people.

Milton Rodregues
Lamb & Company
650 Third Avenue South, 17th Floor
Minneapolis, Minnesota 55402
USA
+1.612.333.8666
milton@lamb.com

Produced by: Doron Kauper
Contributors: Larry Lamb, Mark Mariutto, John Donkin, Kirk Kelley,Gayle Ayers, Keith Cormier, Chris Immroth, Jim Russell, Milton Rodriguez, Jake Parker, Doug Pfieffer, Paul Cammarota, Glenn Batkin, Honey Cohn, Elizabeth Holoubek, Scott Sorokin
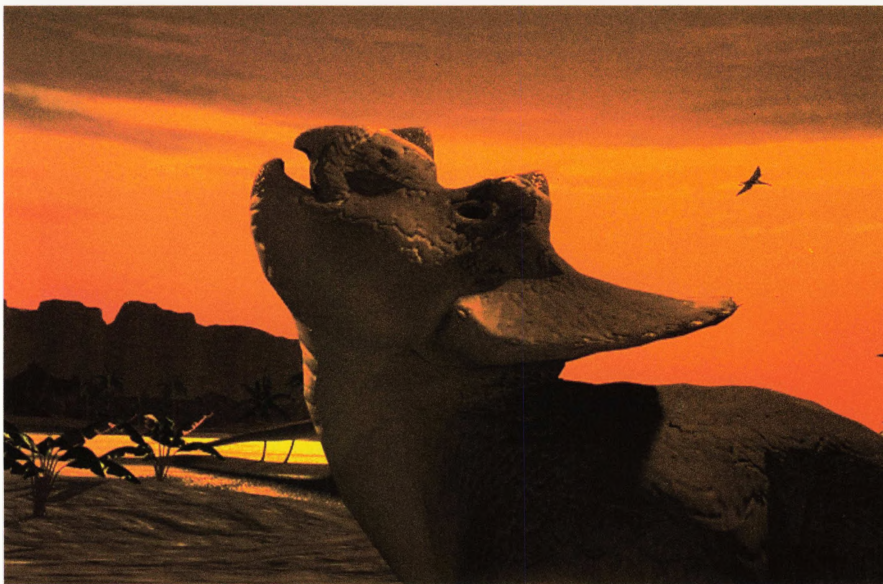
This work was made for the motion ride theater presented by Kansai Electric Power Co., Inc. at "1994 Japan Expo in Wakayama." Baby triceratops walk around the world in the Mesozoic era and experience several surprising affairs.

Koichi Tashiro
Namco Ltd.
16th Floor, New Stage Yokahama Building
1-1-32 Shin-Urashima-Cho, Kanagawa-Ku,
Yokahama 221
JAPAN
+81.45.461.8032

GARDEN

Agarden is a closed world that, for the Chinese, embodies the age-old dream of the micro-cosm. For this reason, the art of gardening is one of the most typical manifestations of Chinese architectural genius. In this piece, modern computer animation technology was used to recreate a southern Chinese garden.

Ivan Shih
CG Computer Graphics Company
4 F-3 65 Sung Teh Road
Taipei
TAIWAN
+886.2.758899

Producer: Ivan Shih
Director: Joey Lin
3D Assistant: Der-Hung Yuan,
   Yu-Jen Tzung

2D art: Lelie Joy, Lion Shih
Music: Joe Chou, Rick Hu
Program development:
   Chuan-Chang Wang,
   Pao-Tzung Lai
Special thanks: SGI, Ken
   Hanabusa, National Center
   for High-Performance
   Computing

Hardware: Silicon Graphics
   Workstations, IBM PCs
Software: Wavefront, Prisms,
   AMOD (in-house modeling
   software), Photoshop
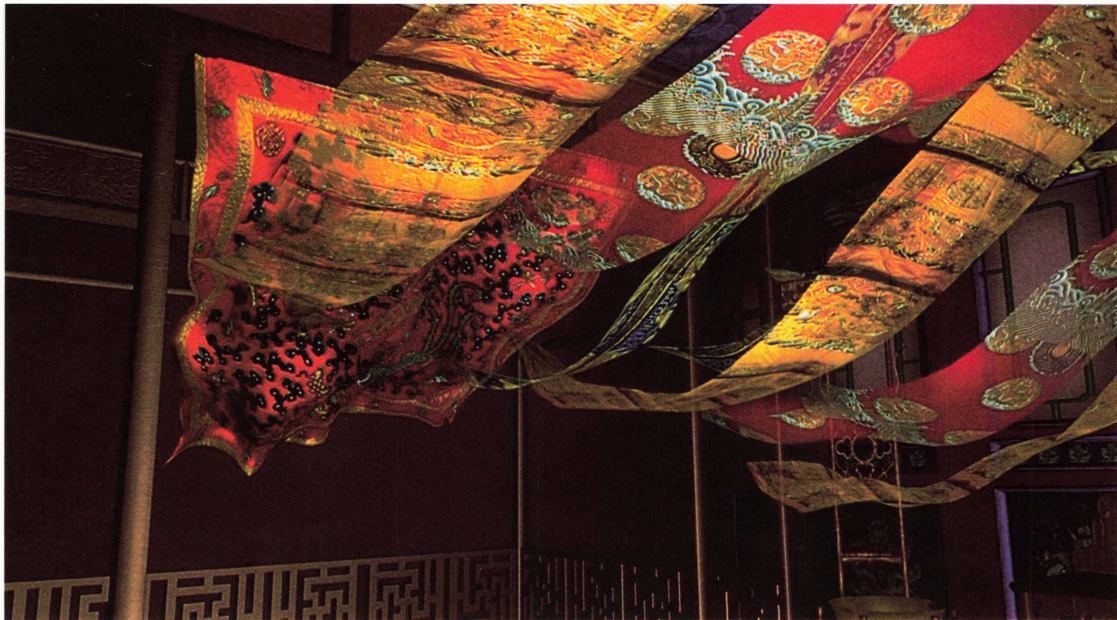
DRAGONMAN

Dragonman goes for a walk: a character study blending elements of eastern and western dragon mythology with lion hair as a symbol of dragonman's nobility.

Kelvin Lee
Sony Pictures Imageworks
1831 Colby Avenue, Apt. #3
Los Angeles, California 90025
USA
+1.310.280.7896
kelvin@spimageworks.com

Produced by: Kelvin Lee

FREE-QUENT OBJECTS

Objects are shown in succession in the midst of a blank space similar to a canvas. The objects move around freely, creating reverberations through their interactions. The result is an array of beautiful shapes and patterns.

Kazuma Morino
Taiyo Kikaku Co., Ltd.
2-2b-3 Nishishimbashi Minato-ku
Tokyo 105
JAPAN
+81.03.3436.4540

Producer and Director:
   Kazuma Morino
Music: Yoshiyuki Usui
Programmed by:
   Satoshi Tsukamoto
Special thanks to: Yuji Furuta,
   Dai Otofuji, Hideto Kanou
Presented by: Kazuma Morino,
   Taiyo Kikaku Co., Ltd.
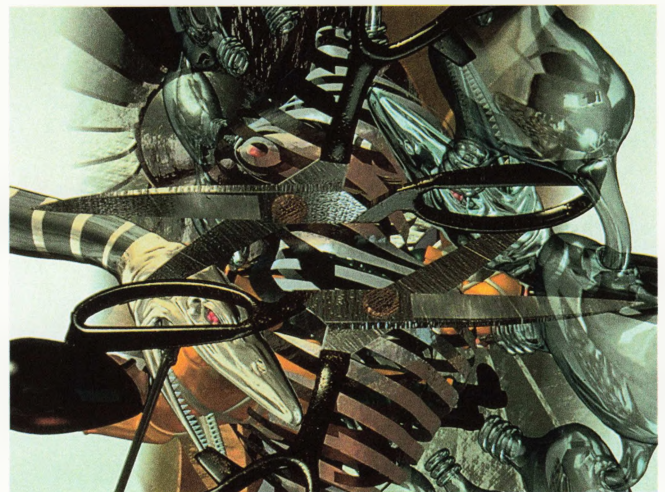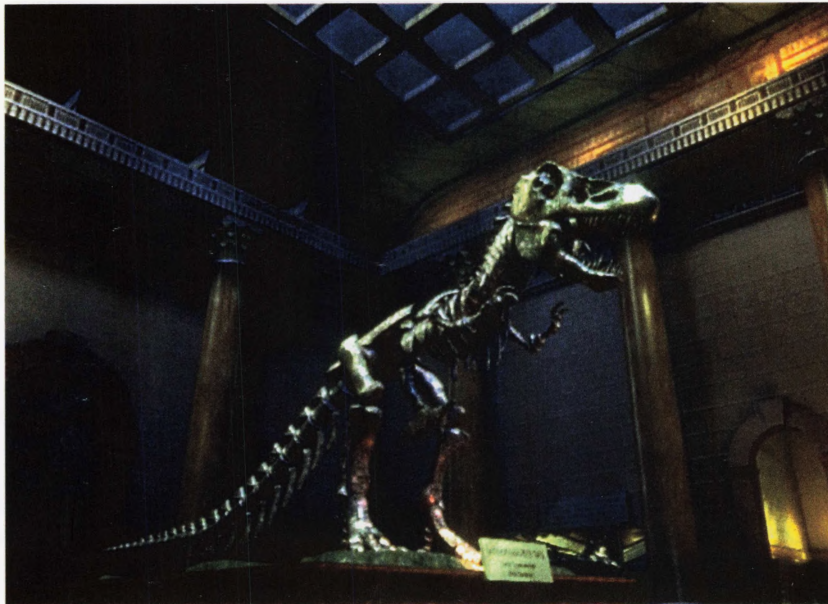
SOK

John Robeck
Pacific Data Images
1111 Karlstad Drive
Sunnyvale, California 94089
USA
+1.408.745.6755
jr@pdi.com

Computer animation produced
    by: Pacific Data Images, Inc.
Executive Producer: Brad Lewis
Senior Producer:
    Jana Canellos
Animation Director/Animator:
    Raman Hui
Technical Director/Lighting:
    Nick Ilyin
Assistant Producer:
    Martin Oppus
Client: Omnibus Japan, Cente
    Service Corporation
FOR OMNIBUS:
Chief Producer:
    Shun Miyashita
Production Manager:
    Yashushi Hasegawa
FOR CENTE SERVICE:
Executive Producer:
    Kousuke Mihara
Producer: Hisashi Nakano

Through the ages, humans have read magical powers into the depths of a crystal ball. Is it all within our minds? Before us, the inner space of the crystal ball awakens. Beautiful bubbles, with a mind of their own, create a wizard. With a puff, his hands form out of crystal, releasing a galaxy of planets. The parlor transforms into Sci-Fi Channel space.

Edward Bakst
160 West 96th Street #9n
New York, New York 10025
USA
+1.212.666.2579

Client: Sci-Fi Channel
Designer/Director:
    Edward Bakst
Sci-Fi Channel:
Executive Producer:
    Paula Brown
Producer: Ken Krupka
CG Facility: Movida 3d
CG Animator: Anthony Huerta
TD: Stephane Simal
Online Producer: Ben Stassen
Production Manager: Caroline
    Van Iseghem
Sound design: Cliff Schwartz
    Prod., USA.
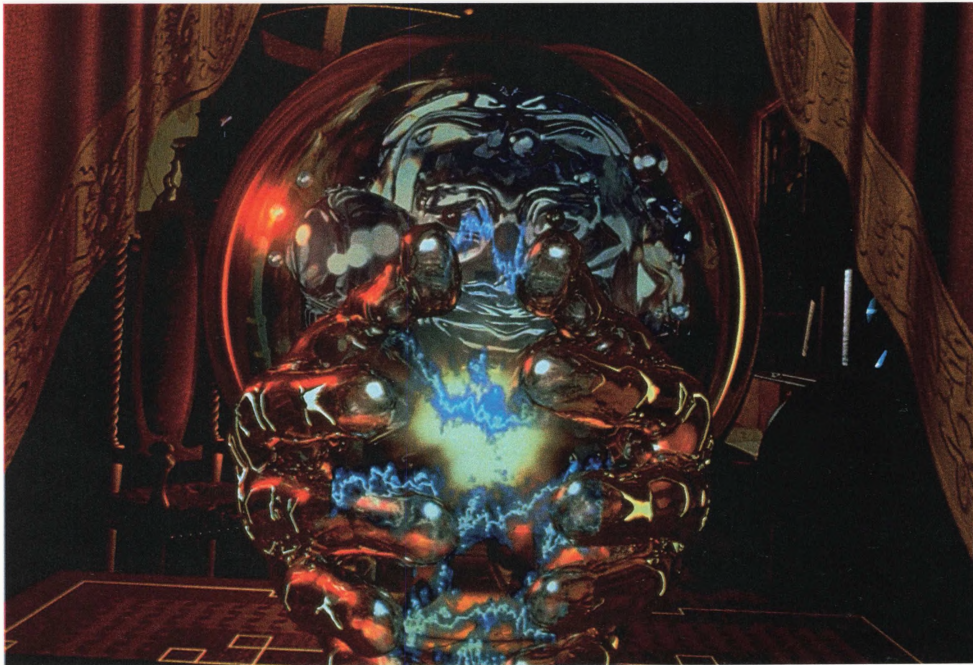
Images of Utah, an animated flight through Utah terrain, combines digital elevation data, the LANDSAT Mosaic of Utah, and 3D models for a unique guided tour. Hover over blazing olympic torches, fly under a dinosaur, experience scenic mountains, wide canyons, and rugged peaks that characterize the unforgettable Images of Utah.

Jeff Chevalier
Space Dynamics Lab
Utah State University
1747 North Research Parkway
Logan, Utah 84341
USA
+1.801.755.4371
jeffc@sdl.usu.edu

Producer: Visual Insight/Space Dynamics Laboratory/ USURF
Visual Effects Animators: Jeff Chevalier
Custom software: Visual Insight/SDL/USURF, Shaun M. Osborn
Visual Effects Supervisor: Shaun M. Osborn
Visual Effects Coordinator: Dean S. Garlick
Visual effects concept: J. Steven Hansen, Dean S. Garlick, Shaun M. Oborn, Kathleen Kuvinka
Technical Writer: Kathleen Kuvinka
Terrain database: USDI National Biological Service Gap Analysis Program, Utah Cooperative Fish and Wildlife Research Unit, College of Natural Resources at Utah State University
Visual Effects Advisor: Larre N. Egbert, Utah State University Computer Science Department
Hardware: Silicon Graphics, Inc.
Software: Custom, Pandemonium, nTitle
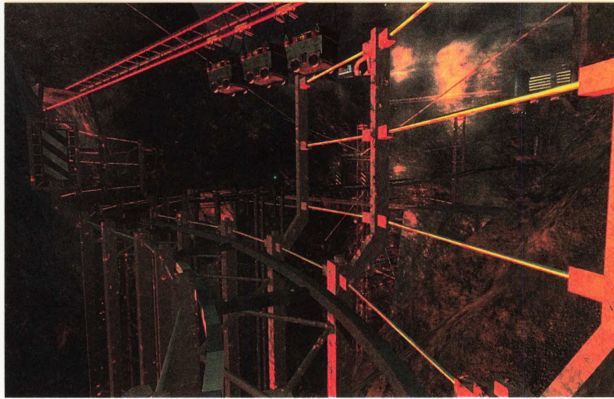
THE VOLCANO
MINE RIDE

The Volcano Mine Ride takes us on an exciting tour of a volcanic mining operation on a distant planet. This ride film will be available in all formats (film and video) in the summer of 1995.

Ben Stassen
New Wave Entertainment
289 Oudergemlaan
1040 Brussels
BELGIUM
+32.2.649.9406

Producer: Ben Stassen
Production: New Wave
Entertainment/MOVIDA
Production Designer:
   Ray Spencer
Key Animator:
   Sylvain Delaine/MOVIDA
Sound: Yves Renard,
   Pierre Lebecque

This computer-generated sequence of scenes is an excerpt from the otherwise traditionally created cartoon animation motion picture Asterix in America, released in October 1994. The scenes show Asterix, Obelix, and their Roman enemies crossing the Atlantic during a thunderstorm.

Rolf Herken
mental images GmbH & Co. KG
Rankestrasse 9 D
10789 Berlin
GERMANY
+49.30.8821088
rolf@mental.de

Produced by: mental images
   GmbH & Co. KG
Director: Gerhard Hahn (Hahn
   Filmproduktion GmbH)
Technical Director: Gerhard
   Gutschmidt, Gegory Lakner
Assistant: Charlotte Manning
System and software support:
   Alexander Lobodzinski
Special Software Developer:
   Thomas Driemeyer, Karl
   Schmidt, Silviu Borac and
   others
Director of R&D: Rolf Herken
Organization and
   coordination: Silvia Hanko
Hardware: SGI Indigo 02
   Extreme for interactive work,
   FDDI-connected cluster of
   eight HP 735 workstations
   for parallel rendering
Software: Softimage
   Creative Environment, Eddie,
   TOON2, mental ray

Reminiscent of 1930's style graphic poster art, a marching line of pants parades along over a khaki background. We soon discover that our hero is a bit different from the rest and has to make a decision whether or not to join the others.

Kori Rae
Pixar
1001 West Cutting Boulevard
Richmond, California 94804
USA
+1.510.215.3420
kori@pixar.com

Produced by: Susan Hamana/ Pixar
Animation/Art Director: Jan Pinkava
Technical Director: Oren Jacob
Producer: Susan Hamana
Assistant Producer: Kori Rae
Creative Director: John Lasseter
Executive Producer: Darla Anderson
Technical Contributors: Larry Aupperle, Keith Gordon, Mitch Prater, Cynthia Dueltgen, Don Schreiter
Animators: Jan Pinkava, Bob Peterson, Shaun Krause

Output: Cynthia Dueltgen
Sound effects/music: Elias Associates
Video post: Western Images
FCB/SF
Producer: Rob Thomas
Art Director: Beth rue Kicki
Copywriter: Mike Koelker
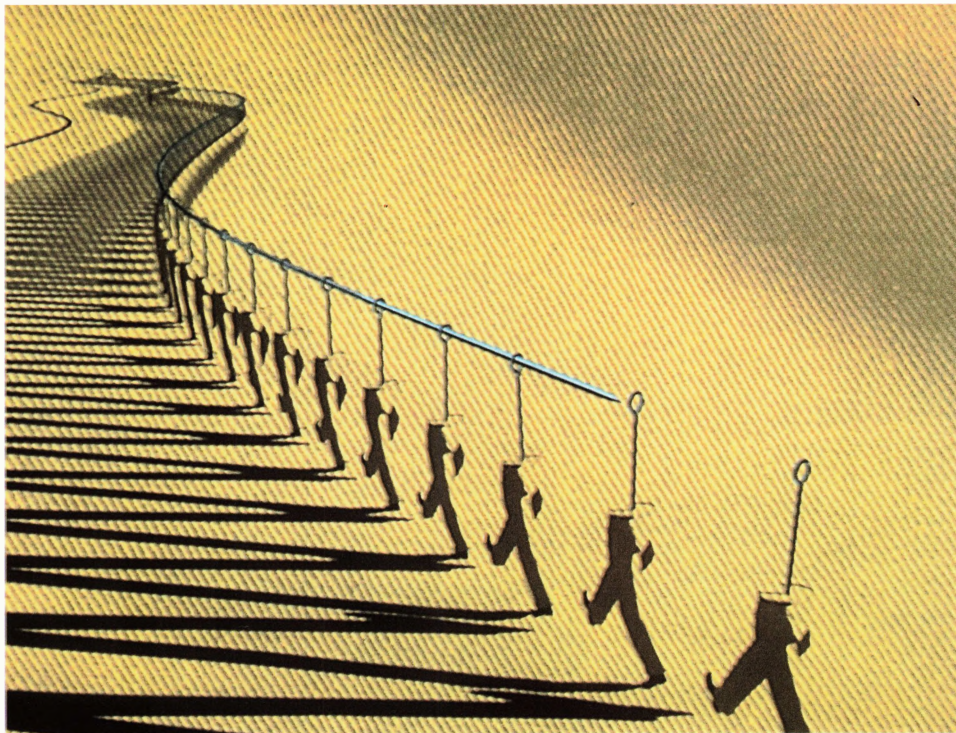
These excerpts from the MGM/UA release of Stargate include a computer-generated time travel machine that hovers like a vertically standing meniscus and transports live actors across the galaxy, a series of helmet transformations accomplished through computer animation, and city vistas and crowds created through digital replication of photographic images.

Tim Rowell
Kleiser-Walczak Construction Company, Inc.
30 Riverview Road
Lenox, Massachusetts 01240
USA
+1.413.637.8944
tim@kwcc.com

Digital visual effects: Kleiser-Walczak Construction Company, Inc.
Digital Visual Effects Producers: Jeffrey A. Diamond and Michael Van Himbergen
Kleiser-Walczak Construction Company, Inc.
Digital Visual Effects Staff:

Executive Producer: Jeffrey Kleiser, Diana Walczak
Digital Effects Supervisor: Jeffrey A. Okun
Line Producer: Robert O'Haver
Production Manager: Thomas M. Boland
Software development: Frank Vitz
Technical Supervisor: Derry Frost
Senior Animators: Ed Kramer, Eileen O'Neill, Jeffery A. Williams, Mark M. Pompian, Mary Nelson, Michael Rivero, Patsy Frost, Randy Bauer, Art Morel
Animation Assistants: Erika Walczak, Joe Hall, Daniel Klem
Assistant Coordinator: Lorraine "Deedle" Silver
Roto Artists: Alexander R. Pitt, Meg Freeman
Data construction: Steve del George
Digital assistance: Nicholas Hoppe, Robin Kristin Francis
Additional software: Serge Sretschinsky
Systems Manager: Bill Besanceney

Landing on an ice cliff, we are surprised when it crumbles from beneath us. We fall down with the ice to just above the water, then turn and fly over the cliff we fell from. Produced with SGI running Softimage CE with Particle and Minerva. Rendered in HD.
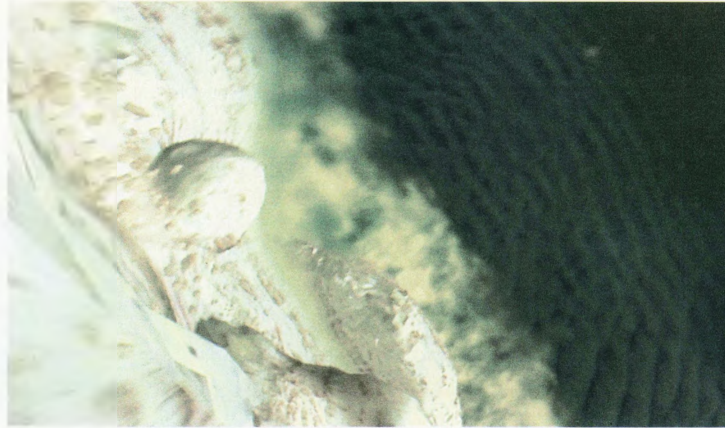
Paul Scott
digital artworks
2295 Coburg Road, Suite 104
Eugene, Oregon 97401
USA
+1.503.344.6541
Artworks@efn.org

For digital artworks: Paula
    Conn, Erik Johnson, Todd
    Kesterson, David Lang,
    Andy Larkin, Sunny Liau
For Midland Productions: Yas
    Takata, Larry Strothe
For Busch Entertainment Corp.:
    Eric Miles

A TV commercial produced completely in computer-graphics animation.

Taiyo Kikaku Co., Ltd.
Computer Graphics Room
2-26-3 Nishishinbashi Minato-ku
Tokyo, 105
JAPAN
+81.03.3436.4540

Produced by: Kiji Okada
Client: JAC
Director: Kazuma Yamamoto
CG Producer: Mashiro Katsuta
CG Director: Kazuma Morino
Art Director: Toshiyuki Takagi
CG Animator: Dai Otofuji
Technical Director: Satoshi
    Tsukamoto
Production Manager: Kentaro
    Tanaka, Junko Yamauchi

Character animation with flexible 3D models. A variety of kinematic and dynamic methods are used to move the whale, penguins, water, and ice.

Geoff Wyvill
Animation Research Limited
Level 2, AA Center
450 Moray Place
Dunedin
NEW ZEALAND
+64.3.479.8449
geoff@otago.ac.nz

Producer: Animation Research
 Limited
Director: Directed by
 committee
Client: Bluebird
Agency: Mojo
Production Company: Phantom
 FX and ARL
Modeling and animation:
 Stuart Smith, Paul Sharp,
 Nigel Caughey, Craig
 McNaughton
Hardware: DEC Alpha, HP
 735, SGI Indy
Software: Katachi ARL in-house
 animation system
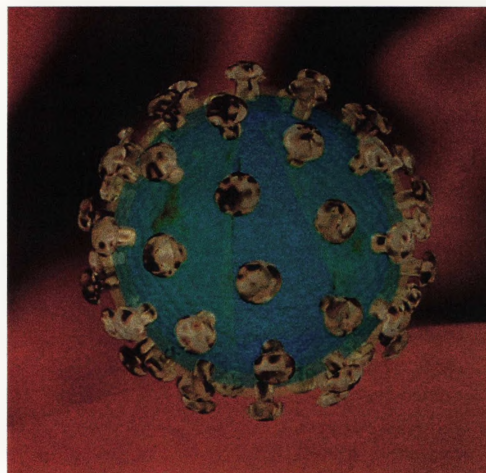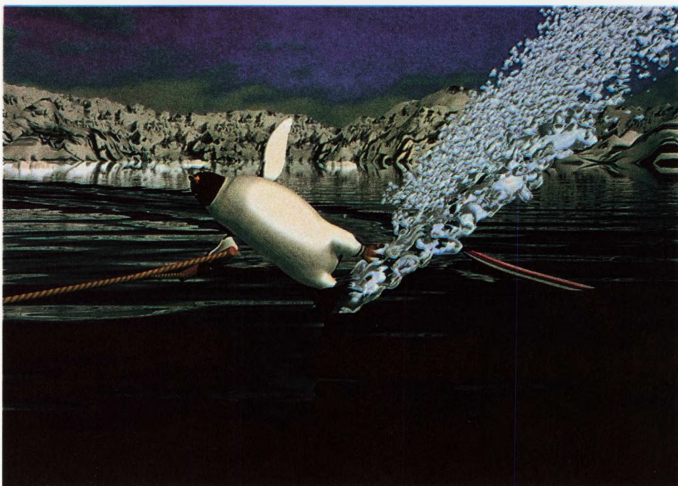
This edition of Looking into HIV constitutes a preview of the work in progress: a technical educational video on the molecular biology of HIV. In this version, we show a scale model of HIV consistent with scientific imaging studies, and we illustrate the structure and function of reverse transcriptase.

Teresa Larsen
The Scripps Research Institute
MB5
10666 North Torrey Pines Road
La Jolla, California 92037
USA
+1.619.554.9947
larsen@scripps.edu

Produced by: Teresa Larsen
The Scripps Research Institute:
 Teresa Larsen, David S.
 Goodsell, Thomas J. Macke,
 Garrett M. Morris, Arthur J.
 Olson.
Center for Advanced
Biotechnology and
Medicine/Rutgers:
 Edward Arnold, Chris
 Tantillo
San Diego Supercomputer
Center: Robert Russ, Jonathan
 Jenkins, Portia Allen, Harry
 Ammons, David Stanley,
 John Nason

For this film, variations of architectural form are derived through an algorithmic interpretation of biological evolution. Based on an initial chance of mutation and degree of change, a parametrically described geometric primitive evolves, through successive generations, into recognizable architectural structures. These evolve offspring that retain parental characteristics either in pure or mutated form.

Beth Blostein
Terry Monnett
The Advanced Computing Center
for the Arts and Design
Ohio State University
1224 Kinnear Road
Columbus, Ohio 43212
USA
+1.614.292.3416
blostein@cgrg.ohio-state.edu
tmonnett@cgrg.ohio-state.edu
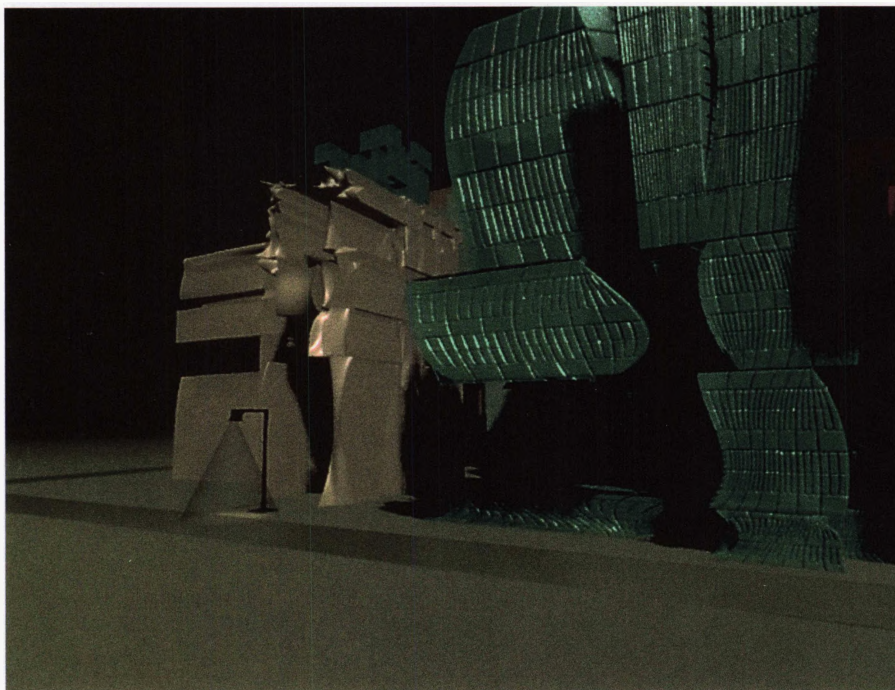
SELFPORTRAIT

The piece is a self-portrait that deals with the integration of so-called traditional media (such as film, photography, etc.) into the digital environment. In addition to personal issues of loss, the piece deals with representation of the figure in the digital environment (real and virtual). The piece contains Super 8, 16mm, and video footage. The animation was executed with Alias software and rendered on an Onyx.

Claudia G. Herbst
Imaging Research Center
5025 Williston Street
Baltimore, Maryland 21229
USA
+1.410.455.3373
claudia@irc.umbc.edu

Produced by:
    Claudia G. Herbst
Music: Renee Seinfield

CONTEXT

According to an interview with Robert Oppenheimer, the physicists working on the Manhattan Project thought of the work only as a simple and elegant demonstration of the theory of relativity. Their reaction to the first detonation was a response to that beauty. This piece is about that response.

Neal McDonald
Tonya Ramsey
The Advanced Computing Center
for the Arts and Design
Ohio State University
364 West Lane #905
Columbus, Ohio 43201
USA
+1.614.294.7766
mcdonald@cgrg.ohio-state.edu

Produced by: Neal McDonald
    and Tonya Ramsey

You should love glass and poison
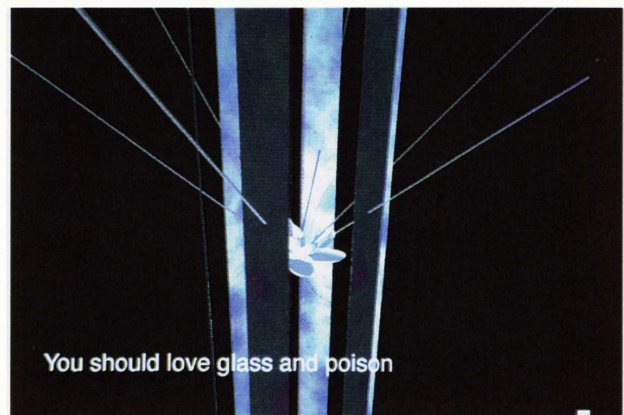
The poet calls Ear Drummer a word song rather than a poem because very few words are used in it to produce many different meanings and many different rhythms. Each syllable is supported by an image in time, color, and action.

Karen Nir
Florida Center for Electronic Communication
220 Southeast Second Avenue
Fort Lauderdale, Florida 33301
USA
+1.305.760.5618
nir@lauteate.cec.fau.edu

Produced by: Edmund Skellings
Hardware: Alias, Wavefront, Xaos, SGI
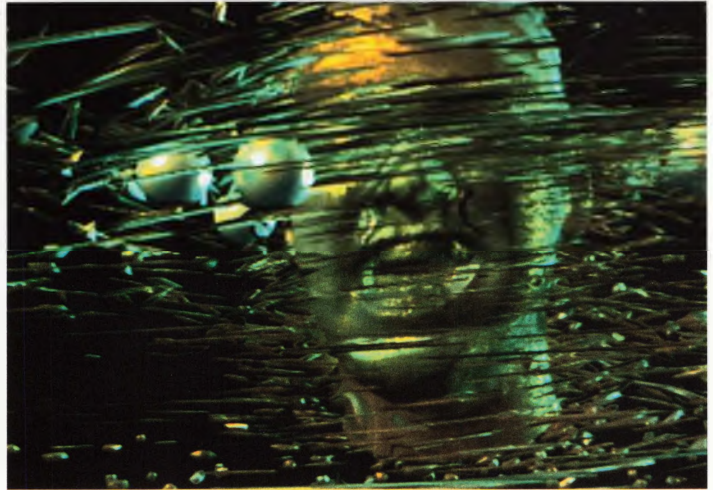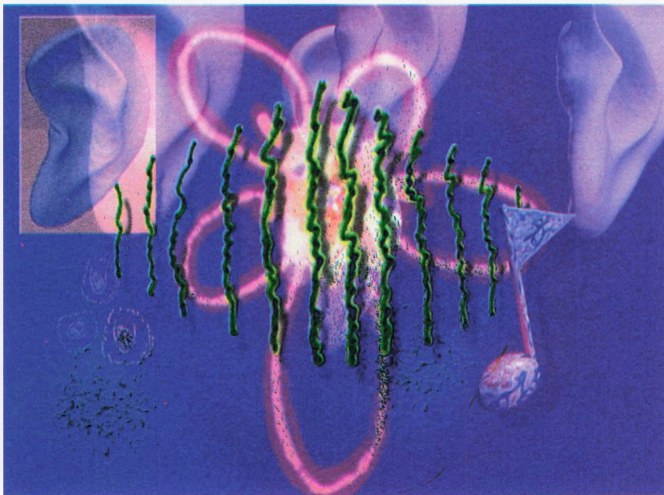
YESTERDAY WHEN I WAS MAD

Music promo for The Pet Shop Boys showing various states of madness and zany images, with Chris Lowe's head taking on maniacal and bizarre forms.

Susanna Racke
601FX
34 Great Pulteney Street
London, WIR 3DE
UNITED KINGDOM
+44.171.439.2730
100542.2563@compuserve.com

Computer animation: 601FX
Director: Howard Greenhalgh, Why Not Films
Post production: Soho 601
Henry Operator: James Bygrave
Music: The Pet Shop Boys

Moxy is television's first real-time performance animation character. Moxy and his side-kick, Flea, appear weekly on Turner Broadcasting's Cartoon Network, treating viewers to cartoon favorites as well as irreverent exchanges of commentary. The half-hour Moxy Show features the voices of comedians Bobcat Goldthwait and Penn Jillette.

Jo-Carol Block
(Colossal) Pictures
2800 Third Street
San Francisco, California 94107
USA
+1.415.550.8772

Produced by: Ann Brilz
   Production Company
   (Colossal) Pictures and
   (PROTO)ZOA, INC.
Director: Tim Boxell
Animation Director: Marc
   Scaparro
Animator: Dan Hanna
Designer/Performer: John
   Stevenson
Animation Software Engineer:
   Eric Gregory
Editor: Lili Cunningham
Line Producer: Karina Jakelski
Macintosh Technical Director:
   Jim Koulias
Background Artist: Sara
   Anderson
Voices: Bobcat Goldthwait,
   Penn Jillette

An olive grapples its way into a glass of Gilbey's Gin.

Suzanne Datz
Rhythm & Hues Studios
5404 Jandy Place
Los Angeles, California 90066
USA
+1.310.448.7500
suze@rhythm.com

Produced by: Kristina Reed
Director: Randy Roberts
CGI Director: Kerry Colonna
Head Technical Director:
    Rodian Paul

FRUTOPIA
FIGHTING FRUIT

Fighting Fruit is one of nine commercials designed and created by Click 3X for the launch of Frutopia. It was achieved by manipulating live-action footage of fruit using Discreet Logic's Flame software then rendering in 3D with Softimage to produce the Kaleidoscope effect.

John Lovelace
Click 3X
16 West 22nd Street, 4th floor
New York, New York 10010
USA
+1.212.627.1900

Executive Producer: Hector Maclerod
Line Producer: Connie Beth Speight
Production Company: Farenheit Films
Director: Greg Ramsey
Executive Producer: Bobby Fisher
Producer: George Fares
Agency: Chiat Day/NY
Executive Producer: Andrew Chinich
Producer: Peter Cline
Creative Director: Marty Cooke
Copywriter: Mike Rosen
CGI and compositing: Click 3X
Designer/CGI Animator: Bruce Steele
Flame Editors: Phil Price, Grant Watkins, Tera Petersen

This video is an unedited recording of a real-time session with Vis5D using GOES satellite images to verify cloud and wind predictions made by Bob Aune's CRAS model.

Bill Hibbard
Space Science and Engineering Center
University of Wisconsin
1225 West Dayton Street
Madison, Wisconsin 53706
+1.608.263.4427
whibbard@macc.wisc.edu

Produced by: Bill Hibbard,
    Brian Paul, Bob Aune
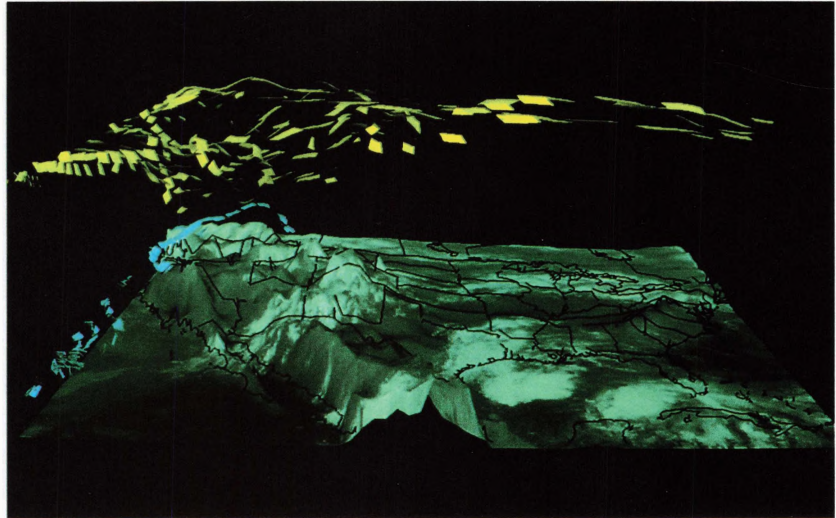
DIVERSION
SEQUENCE

Sequences of diversion appear throughout the universe at different spatial scales and along different axes of time and perception. Diversion sequences hold that nature tends toward diversity, that we are nowhere near the end of creation, and that we are nowhere near the end of explaining nature.

John Adamczyk
728 North Wilson Avenue
Pasadena, California 91104
USA
+1.818.295.2314
jwalt@sre.sony.com

Produced by: John Adamczyk
Music: Michael Dunnigan
Produced at:
    Homer & Associates
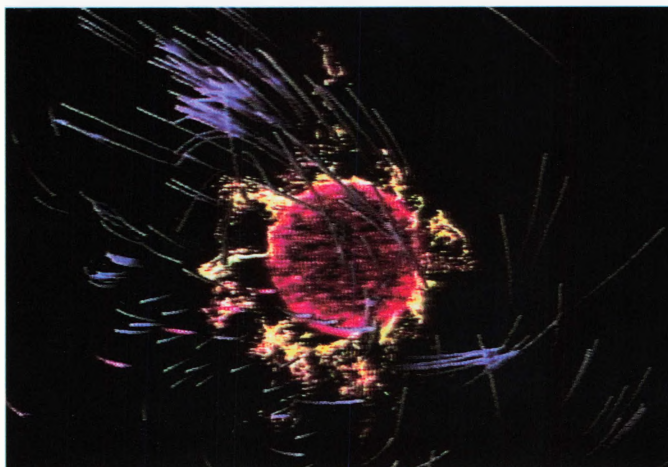
Cosmic Pinball is a Showscan process (70mm 60fps) motion simulation ride. The ride takes place in a giant pinball type of environment somewhere in outer space. Nine vehicles (VW, Chevy...retrofitted with turbo reactors) are competing in a game of elimination.

Ben Stassen
New Wave Entertainment
289 Oudergemlaan
1040 Brussels
BELGIUM
+32.2.649.9406

Producer: Ben Stassen
Production: New Wave
    Entertainment, Showscan,
    CIM
Production Designer:
    Ray Spencer
Animation: TRIX
Key Animators: Jos Claesen,
    Anton Roebben
Sound: Yves Renard, Pierre
    Lebecque

S U I

The hairy creatures of various colors live inside the workstation. They dance gracefully and exchange shades and shapes. The entire form becomes a marvelous and fantastic digital image.

Yasuo Ohba
CG Development Department
Namco Ltd.
1-1-32 Shin-Urashima-cho,
Kanagawa-ku
Yokohama 221
JAPAN
+81.45.461.8032

Producer: Yasuo Ohba
Animator/Technical Director:
    Yasuo Ohba
Music: Ayako Saso
Hardware: Silicon Graphics
    INDIGO2 Extreme
Software: Original
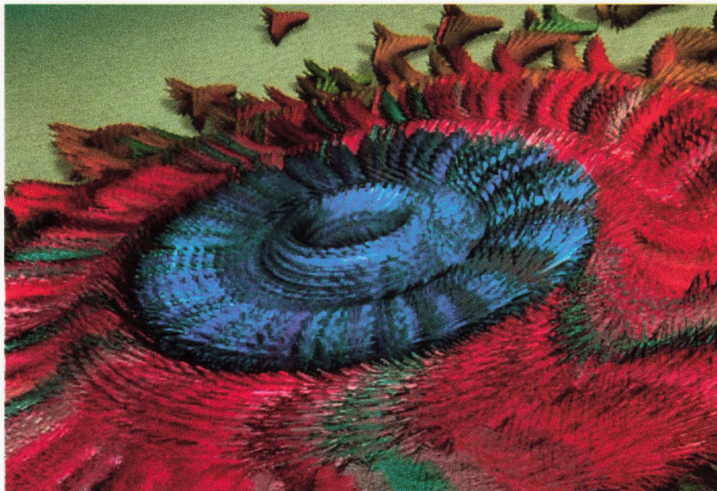
Scott Anderson
Sony Pictures Imageworks
TriStar Building
10202 Washington Boulevard
Culver City, California 90232
USA
+1.310.280.7600

Produced for Mass.Illusion by
  Sony Pictures Imageworks
Visual Effects Supervisor for
  Mass.Illusion: John Sullivan
Visual Effects Producer for
  Mass.Illusion: Diane
  Pearlman
Visual Effects Production
  Manager for Mass.Illusion:
  Susan McLeod

Visual Effects Supervisor: Scott
  E. Anderson
Visual Effects Producer:
  Julia Rivas
Visual Effects Coordinator:
  Mageara Cameron
CG Supervisor:
  Ron Brinkmann
Animators: Lisa Adamson,
  Barbara Bordo, Heather
  Davis, Tim Douglas, Steve
  Kennedy, Scott Kilburn,
  Kelvin Lee, Scott McKee,
  Kristen Trattner, Peter
  Warner
Software Engineers: Arnaud
  Hervas, Luigi Warren
Technical Assistance:
  Tim Teramoto

FX Editor: Monica Anderson
Film Recording: John Strauss
Stage Crew:
Production Manager:
  Suzanne Pastor
Camera Department
  Supervisor: Marcus Kraus
FX Director of Photography:
  David Drzewiecki
1st Assistant Camera:
  Max Penner
Key Grip: Tim Thomas
Best Boy Grip: Gino Nix
Gaffer: Don Robinson
Best Boy Electric: Rick Hopper
Electrician: Kerry Magness
VTR Operator: Scott Laurence
Water rig: Norman Griffin
  Productions

SPI Equipment Manager:
  Ferd Metz
Mechanical Engineer:
  Barry Walton
Production Assistants:
  Kevin Bales, Heidi Fischle
Visual Effects Executive
  Producer: George Merkert

The shot creates the illusion that a Los Angeles city bus could jump a 50-foot missing section of freeway. Shot with locked-off Vista-Vision digital matte painting, digital removal of freeway section, digital camera move.

Tim McGovern
Sony Pictures Imageworks
10202 West Washington Boulevard
Culver City, California 90232
USA
+1.310.280.7854

Executive Producer: Bill Birrell
Producer: Mickey McGovern
Production Coordinator:
   Julia L. Rivas
CG Supervisor: Ron Brinkman
Animators: Julia L. Rivas,
   Andrea Losch, Steve
   Kennedy, Kristen Trattner,
   Mitch Rosefelt
Digital Matte Painters: David
   Douglas, Bob Schiefo,
   Karen De Jong
Technical Assistance:
   Richard Edwards

Tom Williams
Industrial Light & Magic
P.O.Box 2459
San Rafael, California 94912
USA
+1.415.258.2000

Special Visual Effects by
Industrial Light & Magic, a
Division of Lucas Digital,
Ltd.
Visual Effects Supervisor:
Scott Farrar
Visual Effects Producer:
Ned Gorman
Computer Graphics
Supervisor:
Sandra Ford Karpman
Visual Effects Art Director:
Claudia Mullaly
Digital Matte Supervisor:
Paul Huston
Visual Effects Editor:
Michael McGovern
Model Shop Project
Supervisor: Lorne Peterson
Visual Effects & Plate Camera
Operator: Patrick Turner
Miniature Lava Photography:
John V. Fante
Visual Effects Camera
Operator: Marty Rosenberg
Digital Scanning Supervision:
Joshua Pines
Digital Timing Supervisor:
Kenneth Smith
Stage Manager:
Edward T. Hirsh
Stage Effects Coordinator:
David S. Dranitzke
Visual Effects Coordinators:
Heather A. Smith, Tina
Gonzalez
Chief Model Makers -
Miniatures Unit: Howie
Weed, Michael P. Lynch,
Charlie Bailey, John

Goodson, Randy
Ottenberg, Eben Stromquist,
Giovanni Donovan,
Barbara Affonso
Key Stage Technicians: David
Heron, Chuck Ray, Craig
Mohagen, Tim Morgan,
David Murphy, Michael
Olague
Computer Graphics Artists:
Karen Ansel, Barbara
Brennan, Bruce Buckley,
Don Butler, Jeff Doran, Raul
Essig, Bijan Foruntanpour,
Greg Maloney, Tom
Martinek, George Murphy,
Eddie Pasquarello, Chris
Townsend, Dennis Turner,
Andy White
Digital Matte Painters: Yusei
Useugi, Bill Mather
Sabre Compositing Artist:
Sheena Duggal
Digital Rotoscope: Julie Neary,
Alia Agha, Betsy Cox,
Susan Kelly, Jodie Maier
Digital Painter: Carol Hayden
Visual Effects Camera
Assistants: John Gazdik,
David Hallinger, Robert Hill,
Rich McKay
Senior Scanning Operators:
Randall K. Bean, George
Gambetta
Scanning Operators: Mike
Ellis, John Whisnant
Model Makers - Miniatures
Unit: Tony Sommers, Jon
Foreman, Steven Walton,
J.D. Durst, Christopher A.
Reed, Larry Tan, Wendy
Morton, Scott McNamara,
R. Kim Smith, Geoffrey
Lake, Danny Wagner, Bob
Cooper, Mark Anderson,
Chuck Wiley, Richard
Miller, Ira Keeler, Sean

Casey, Nelson Hall, Don
Bies, Lori Harrison, Carol
Bauman, Marghe
McMahon, Annie Polland,
Matt McLemour, Lauren
Abrams, Rick Vagts, Larry
Eisler
Stage Technicians: Jason
Brackett, Thomas Cloutier,
Berny Demolski, Dick Dova,
David Eagle, Bob Finley, Jr.,
Joe Fulmer, Dennis
Gehringer, Geoff Heron,
Brad Jerrell, Daniel
Michalske, Gus Polle
Plate Photography
Coordinator:
Carol Lee Griswold
Assistant Visual Effects Editor:
Roberto McGrath
Projectionist:
Timothy A. Greenwood
Negative Cutter: Doug Jones
Film Group Coordinator:
Lisa VanCott
Film Group Production
Assistant: Janet Lewin
CG Production Assistant: Jules
Mann, Ronn Brown
CG Technical Assistants:
Theresa Corrao, Dawn
Matheson, Tia Marshall,
Sandy Ritts, Ricardo Ramos,
Digital Film Touch-up: Scott
Bonnenfant, Alan Bailey
Negative Line-up:
Tim Geideman
Optical/Video camera
Operator: James Lim
ILM Model Department
Manager: Jeff Olson
ILM Stage Department
Manager: Pat Fitzsimmons
Computer Graphics & Digital
Staff: Gail Currey, Suzy
V.Tooley, Paul Grimshaw,
John Ellis, Nancy Luckoff,

Dan McNamara, Mary
Serifini, Linda Showers,
Scott Stewart, Lisa Vaughn
Production Services: Paula
Karsh, John Blausey,
Michael Mccabe
Production Accounting:
Pamela Kaye, Sylte, Diana
Crozier
Production Department
Coordinator:
Suzy McLaughlin
Production Operations
Coordinator:
Dawna Weichel
ILM Senior Management:
Patricia Blau, Jeff Mann, Jim
Morris, Tom Williams

High-resolution computer-generated vehicles, vistas, and synthetic characters bring the futuristic world of Judge Dredd's Mega City One to life. Computer-generated elements incorporating motion blur, lens flares, and motion capture were digitally composited with detailed motion control model/miniature and live action photography to make this world a reality.

Diane Pearlman
MASS.ILLUSION
30 Riverview Road
Lenox, Massachusetts 01240
USA
+1.413.637.4500
dipearlman@aol.com

Produced by:
  MASS.ILLUSION
Visual Effects Supervisor:
  Joel Hynek
Visual Effects Producer:
  Diane Pearlman
Visual Effects Coordinator:
  Joan Collins
Digital VFX Supervisor/
  Software Designer:
  Serge Sretschinsky
VFX Art Director:
  Robert U. Taylor
Asst. VFX Supervisor:
  John Gaeta
Computer graphics:
  Kleiser-Walczak
  Construction Company
CGI Supervisors: Jeff Kleiser &
  Diana Walczak
KWC CGI Producer:
  Anezka Sebek
KWC Production Manager:
  Tim Baker Rowell
KWC Head of Software:
  Frank Vitz
KWC Animators: Eileen
  O'Neill , Randy Bauer,
  Jeffery A. Williams,
  Christina Hills, Mike Perry,
  Talmage Watson
KWC lighting:
  Luc Genevriez ,
  Rae Long, Christian
  Foucher, Xavier Duval ,
  Pascal Nicot , Philippe
  Lalouette, Jean Baptiste
  Lere, Jean Francois Rivier
KWC Systems Admin.:
  Joe Hall
Additional KWC CGI
  Support: Mary Nelson,
  Greg Juby , Michael
  Moore, Robin Francis, Scott
  Lord, Daniel Klem, Kristin
  Coppola, Patrick Mooney,
  Santo C. Ragno, Jeffrey M.
  Taggart, Lori Frederick
MASS.ILLUSION:
Digital VFX Animators: Nick
  Brooks, Deborah Wiltman,
  Pam Auditore, Peter Plevritis
PreVis/in-house CGI
  Supervisor: Colin Green
PreVis Designers: William
  McCoy, Mike Schmitt
System Admin.: Rusty Case,
  Richard Duquette
Technical Assistants: Peter
  Chesloff, Al Aumenta, John
  Wright, Sergey Yantovsky
Editorial: Jennifer Wollan
Production: Carrie Owens,
  Heather Sands
Models Supervisor:
  Eric Chamberlain
Motion-control photography:
  David Stewart, David
  Hardberger, Harry Alpert,
  Dwayne McClintock
Additional CGI by: Digital
  Fauxtography, Topix, Los
  Angeles, Amalgamated
  Pixels, Cinemotion Pictures,
  Inc.
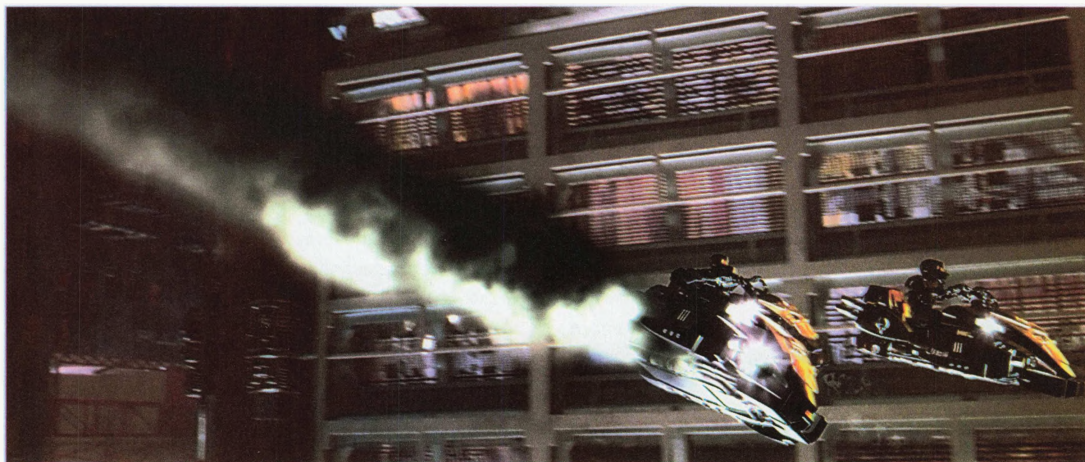
Jeremy's Death is a one-minute 45-second depiction of the journey beyond death for an evil, Satan-worshipping serial killer.

Tim McGovern
Sony Pictures Imageworks
10202 West Washington
Boulevard
Culver City, California 90232
USA
+1.310.280.7854

A Brett Leonard Film

Visual Effects Supervisor:
   Tim McGovern
Visual Effects Designer and Art
   Director: Jon Townley
Visual Effects Producers:
   Camille Cellucci, Aileen
   Timmers
CG Supervisor and Lead
   Animator: Jerome Chen
Supervising Animator:
   Ron Brinkmann
Visual Effects Coordinator:
   Bernice Kenton
Visual Effects Editor: Jim May

Dark Being:
Character Supervisor:
   Louis Cetorelli
Character animation:
   Tim Miller
Emation animation:
   Mitch Rosefelt

Light Being:
Lead character animation:
   Allen Edwards
Emation/cocoon animation:
   Peter Warner

Death Sequence:
Spirit form particle animation:
   Cliff Brett, Matt Hightower
Spirit form face animation:
   Andrea Sholer, Ivo Horvat
   Hatch
Death chamber: Tim Douglas
Light being implosion: Lisa
   Adamson
Samantha vision: Heather
   Davis
Tunnel composition: Juniko
   Moody

Bob Mazza
BOSS Film Studios
13335 Maxella Avenue
Marina Del Rey, California 90292
USA
+1.310.823.0433

Produced by: Donna Langston
    Walt Hyneman, Guy
    Williams, Alan Rosenfeld

BRAIN MASSAGE
AND ROBO-INSECTS

In the future massage is not just
for the body, but also for the
brain.

Satoshi Koreki
Electronic Visualization Lab, UIC
ERF Room 2032
842 West Taylor Street
Chicago, Illinois 60607
USA
+1.312.996.3002
koreki@evl.eecs.uic.edu

Produced by: Satoshi Koreki

A showcase of 601 FX's first year of work.

Susanna Racke
601FX
34 Great Pulteney Street
London, WIR 3DE
UNITED KINGDOM
+44.171.439.2730
100542.2563@compuserve.com

Computer animation: Ian Bird,
    John Wake, Rob Fellows,
    Simon Stoney
Post production: Soho 601
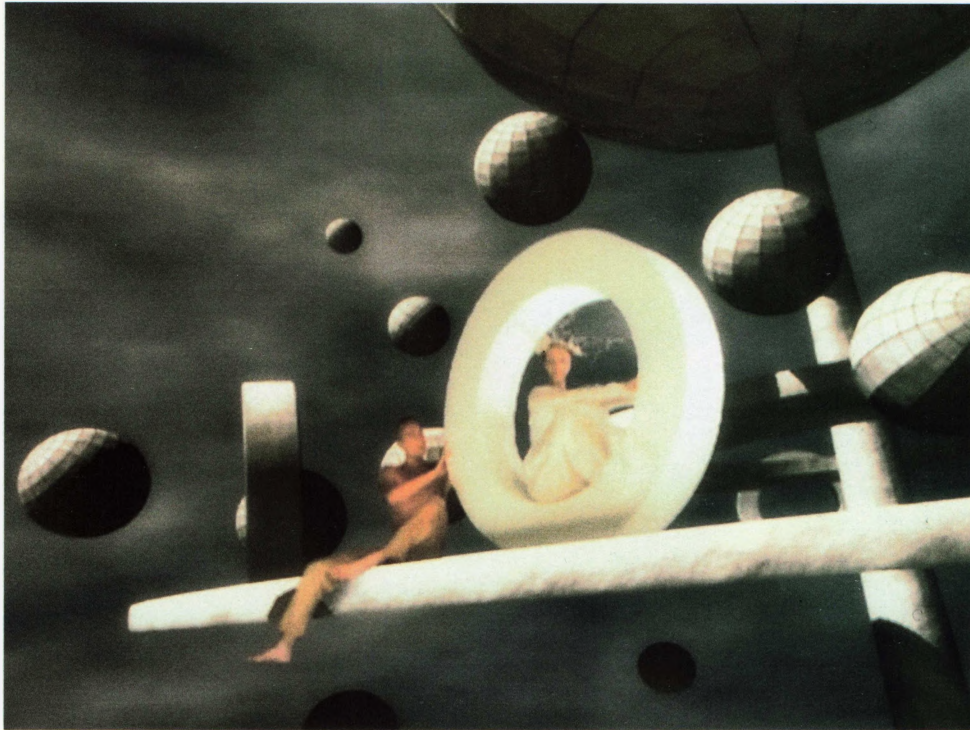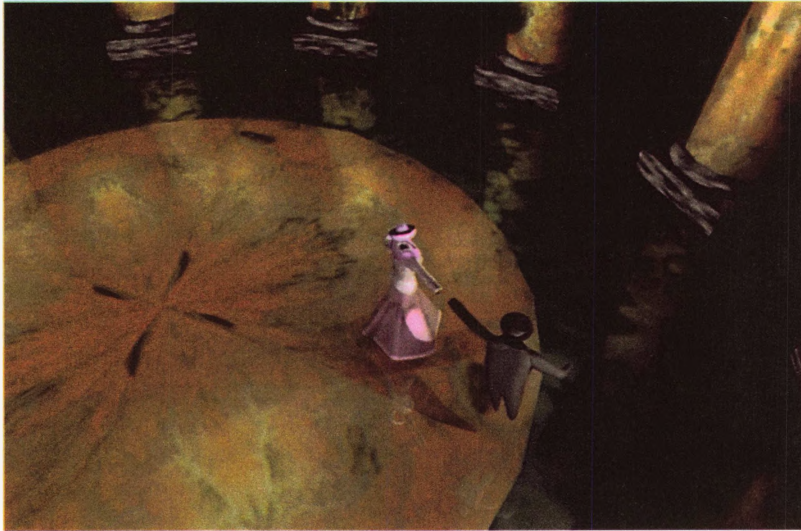
Life is a dance to which everyone is invited. We just don't know when it will end.

Rhett Bennatt
Texas A+M University Visualization Laboratory
216 Langford Center
College Station, Texas 77843-3137
USA
+1.409.845.3465
rhett@viz.tamu.edu

Produced by: Rhett Bennatt
  Texas A+M University
  Visualization Laboratory
Music and sound: Kyle Clark

PANOPTICON

Panopticon is a lyrical, stream-of-consciousness piece which explores notions of time, space, and perception. The narrative of the work is non-linear, with a self-referential use of time and space.

Wen Hwa Seun
Kevin Geiger
The Advanced Computing Center for the Arts and Design
The Ohio State University
c/o 7097 Alvern D319
Los Angeles, California 90045
USA
+1.310.823.0433
nutball@cinenet.net

Produced by: Wen Hwa Seun
  and Kevin Geiger
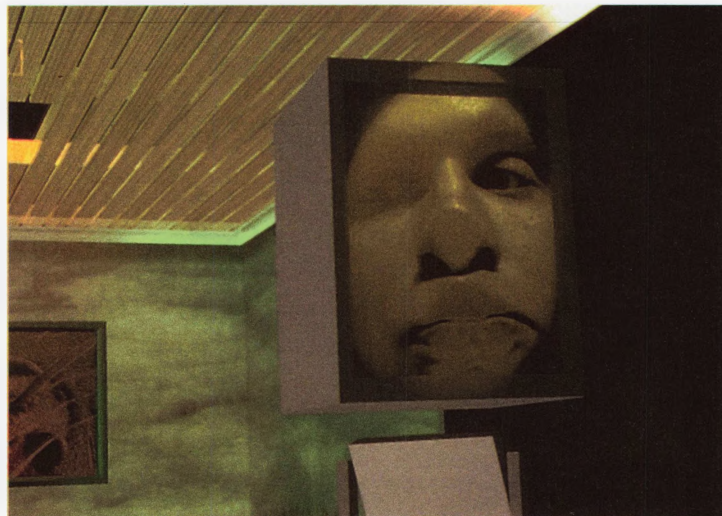
Highlights of the CGI elements in the Walt Disney animated feature Pocahontas. The 3D elements include the Grandmother willow tree, the Susan Constant ship, rain, and Pocahontas' canoe. In addition, all the scenes are digitally scanned, painted, and composited with numerous 2D digital effects.

Edward Kummer
Walt Disney Feature Animation
500 South Beuna Vista Street
Burbank, California 91521-4870
USA
+1.818.560.8210
edward@fa.disney.com

Produced by: Walt Disney Feature Animation CGI Department, as part of the Walt Disney Feature Animation Staff.

TOY SOLDIER

This videotape contains a montage of real-life film images combined with computer graphic character animation and other special effects for TV commercials.

Taiyo Kikaku Co., Ltd.
Computer Graphics Room
2-26-3 Nishishinbashi Minato-ku
Tokyo, 105
JAPAN
+81.03.3436.4540

Produced by: Hiroharu Inutake
Client: Canon Sales Co., Inc.
Agency: Dentsu Inc.
Director: Kazuma Yamamoto
CG Producer: Mashiro Katsuta
CG Director: Kazuma Morino
CG Art Director: Yuji Furuta
CG Animator: Dai Otofuji,
    Mamiko Himuro
CG Technical Director: Satoshi
    Tsukamoto
Production Manager: Junko
    Yamauchi, Yoshihiro
    Nishimura
In House Editor: Hideo
    Okuyama
Editor: Junji Kojima
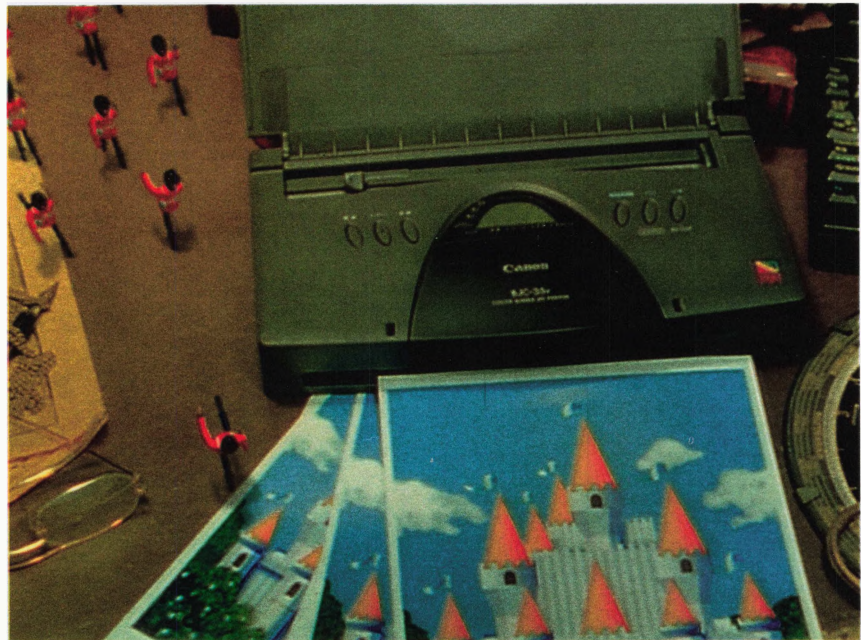
An allegorical film showing the futility of war through one of its most coveted symbols: military decorations.

Michel Fleury
Université du Québec á Montréal
Department of Design
Case Postale 8888
Succ. Centreville
Montréal, Quebec H3C 3P8
CANADA
+1.514.987.3181
graphi@uqxsi.design.uqam.ca

Producer: Michel Fleury
Conceived and directed by:
    Guy Lamprow
Original music and sound
    Effects: Jean-Francois Léger
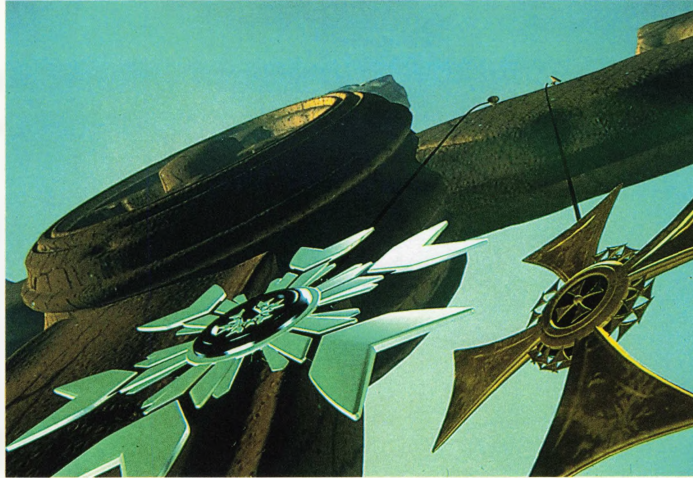
Spheroids in this film are a kind of metaphor for people who live and work in the Tokyo area. These people are extremely busy, due to daily tedious, exhausting tasks. A sudden explosion sets them free for a while, but succeeding days are as oppressive as ever.

Nobuo Takahashi
NTT Human Interface Lab
#5-409A 3-9-11 Midori-cho,
Musashino-shi
Tokyo, 180
JAPAN
+81.0422.59.3689
nobuo@cg.mrb.ntt.jp

Produced by:
    Nobuo Takahashi,
    NTT Human Interface Labs
    CSK, NTT Media Lab
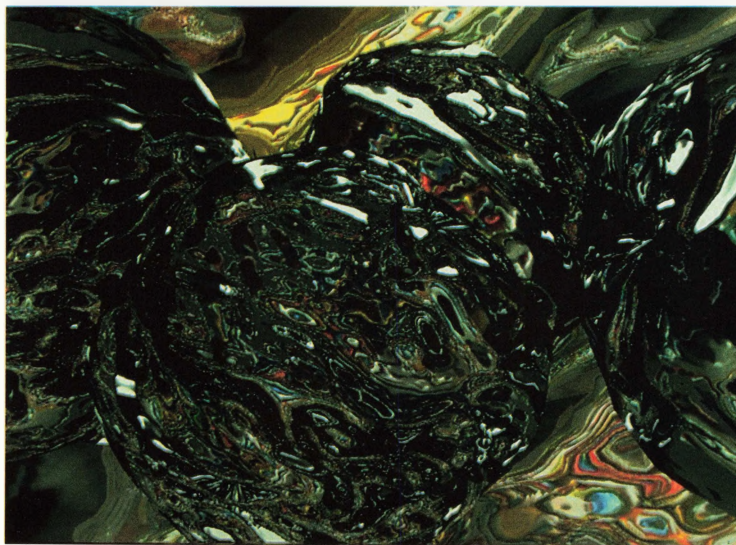
MILK TRIX

Two-dimensional tracking and compositing of live action and bluescreen elements. Composite of cel animation with prosthetic head done in Flame. Morph used to distort actor's face done in Elastic Reality.

Diane Holland
Digital Domain
300 Rose Avenue
Venice, California 90291
USA
+1.310.314.2889
diane@d2.com

FX Producer: John Kilkenny
Visual Effects Supervisor:
   Jay Riddle
CG Supervisor: Daniel
   Robichaud
Digital Artists: Alfred Urittia,
   Doug Roble, Fred Raimondi,
   Price Pethel

TITANS ETERNAL

A titanic struggle between good and evil … or is it?

Stuart Ferguson
Spore Films
3625 South Court
Palo Alto, California 94306
USA
+1.415.493.6265
shf@netcom.com

Produced by: Stuart Ferguson
Music: Mike Hamilton

Imagine a universe in which a spaceship flying off into space in one direction returns to the same spot, without turning back! It's not impossible, if you can set aside conventional notions about the shape of space.

Stuart Levy
The Geometry Center
University of Minnesota
1300 South 2nd Street, Suite 500
Minneapolis, Minnesota 55454
USA
+1.612.626.0888
slevy@geom.umn.edu

Producer: The Geometry Center
Original Concept: Jeff Weeks
Directors: Tamara Munzner, Delle Maxwell
Animators: Lori Thomson, Stuart Levy, Delle Maxwell, Tamara Muzner, Charlie Gunn
Original video draft: Celeste Fowler
Script: Jeff Weeks, Celeste Fowler, Stuart Levy, Delle Maxwell, Tamara Munzner, Lori Thomson, Charlie Gunn
Audio post-production, Sound Design, and Mix: Hudson-Forrester Studios, Inc.

Narration: Robert Strength
Video recording: Lamb & Company
Video technical assistance: Scott Gaff
Sponsors: National Science Foundation, Department of Energy, University of Minnesota
Software: custom, Geomview, X-Geomview Renderer, Maniview, Softimage, Perl
Hardware: Silicon Graphics, Inc.
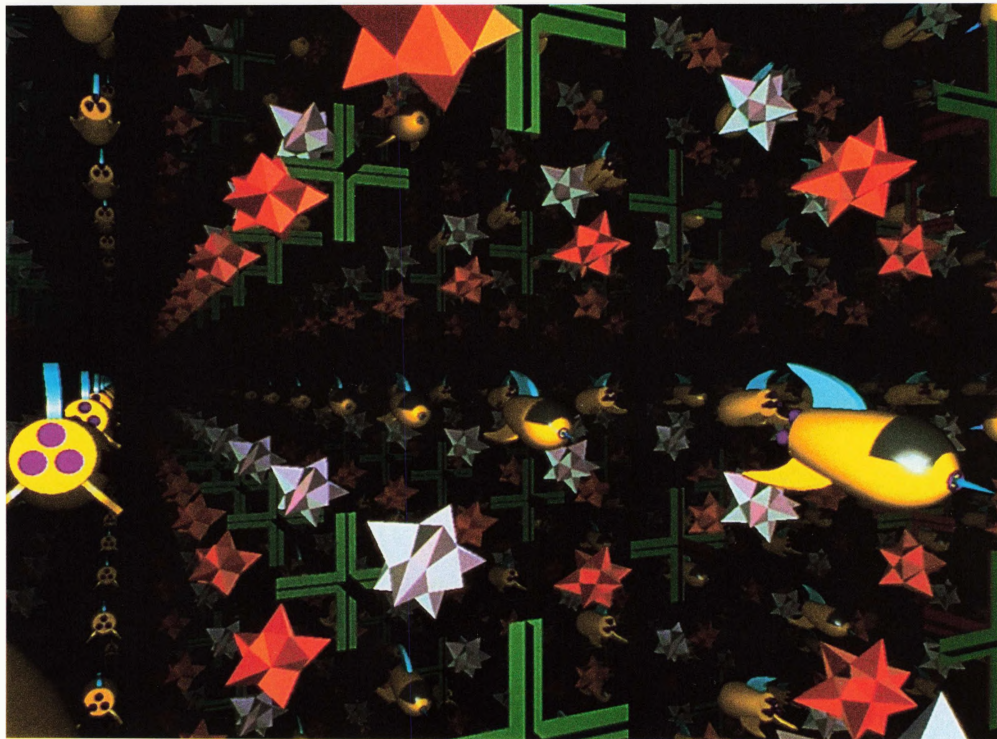
NIKE MAGAZINE
WARS

Background magazine plates
shot on stage. Tennis players
shot green screen. Composited
in Flame.

Diane Holland
Digital Domain
300 Rose Avenue
Venice, California 90291
USA
+1.310.314.2889
diane@d2.com

FX Producer: Paul Hettler
All effects work by
    Fred Raimondi

Fluffy is a computer-generated,
disjointed dimensional dog
that looks like he escaped
from a cubist dimension.
Animated and rendered using
Animation Master, a PC-based
program, Fluffy was printed
on a Canon BJ-600e color
printer onto textured paper,
then filmed using traditional
animation techniques.

Douglas Aberle
Aberle Films
12800 Northeast 191st Circle
Battle Ground, Washington 98604
USA
+1.360.687.6851

Writer/Producer/Director:
    Doug Aberle
Animators: Tracy Larson,
    Galen Beals
Additional animation: Doug
    Alberle, Cabbott Sanders
Animation Master: Martin
    Hash
Editor: Tom Sheft
Camera: Tom Sheft
Music: Jon Newton
Theme: Doug Aberle
Character & set design:
    Robin Ator, Doug Aberle
Storyboard Artist: Robin Ator
Rendering & printing: Will
    Pickering
Sound mixing: Jamie
    Haggerty
Music mixing: Michael Bard
Sound recording: Tom Sheft,
    Steven Carpenter
Titles: Marilyn Zornado
Vocalization: Scott Sundholm
Reference Actor: Doug Aberle
Reference Dog: Lucy Aberle
Special thanks to: Hash, Inc.,
    Will Vinton Studios, Randy
    Croucher, Kyle Bell, Bob
    Croucher, Sandy
    Sycafoose, Mathew
    Brunner, Bruce Roger, Gary
    McRobert, Alpha Cine,
    Martin Hash, Teknifilm, Julie
    Chin, Jim McAllistar,
    Newton Bard, Inc., The
    Aberle Family Singers
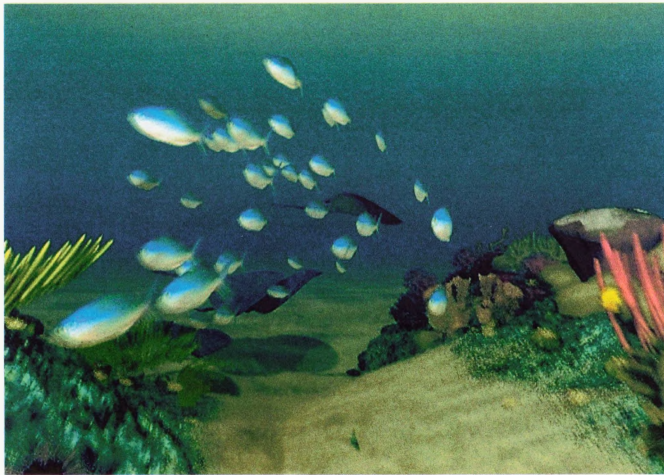
OCEANIC

Underwater fantasy open to promote Oceanic dive equipment.

We are surrounded by a constantly changing world. Our lives are so short, like a single flash of light. Yet we encounter so much laughter and sorrow. The swirl effect is developed to create a liquid-like, constantly changing motion. The sound also changes to match the visual effects.

Tom Williamson
Computer Cafe
3130 Skyway Drive #603
Santa Maria, California 93455
USA
+1.805.922.9479
tomcat@terminus.com

Produced by:
  Paula K. Productions/
  Computer Cafe,
  David Ebner, Tom
  Williamson, Jeff Barnes, Ron
  Honn, Inan Romero, Peter
  Killian

Masa Inakage
The Media Studio, Inc.
2-24-7 Shichirigahama-Higashi
Kamakura, Kanagawa
JAPAN
+81.467.32.7941
inakage@media-studio.com.jp

Produced by: Masa Inakage

A NATIONAL
GEO-GRAPHICS
SOCIETY SPECIAL:
THE UNDERSEA
WORLD OF
JACK COUSTO

Jack's cinematography reveals a world of colorful artificial fishes. We observe mating displays and other elaborate piscatorial behaviors. Dangerous predators stalk in the deceptively peaceful habitat. Details about the modeling techniques are in technical papers in the SIGGRAPH 94 and 95 Conference Proceedings.

Demetri Terzopoulos
Department of Computer Science
University of Toronto
10 King's College Road
Toronto, Ontario M5S 1A4
CANADA
+1.416.978.7777
dt@cs.toronto.edu

Produced by: Xiaoyuan Tu,
    Radek Grzeszczuk, Demetri
    Terzopoulos
Narration: Oliver Tridon
Production Assistants:
    Michiel van de Panne,
    Michael McCool
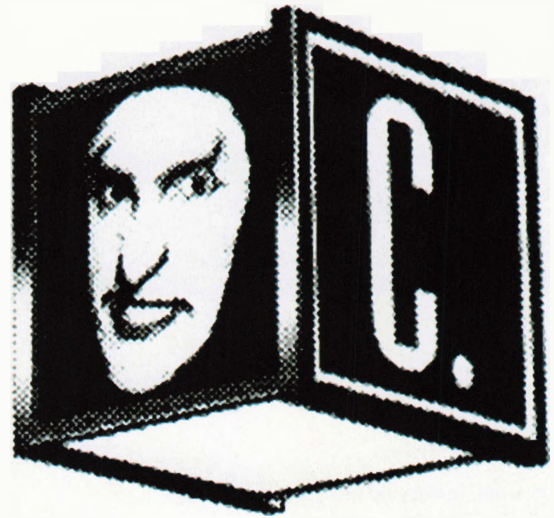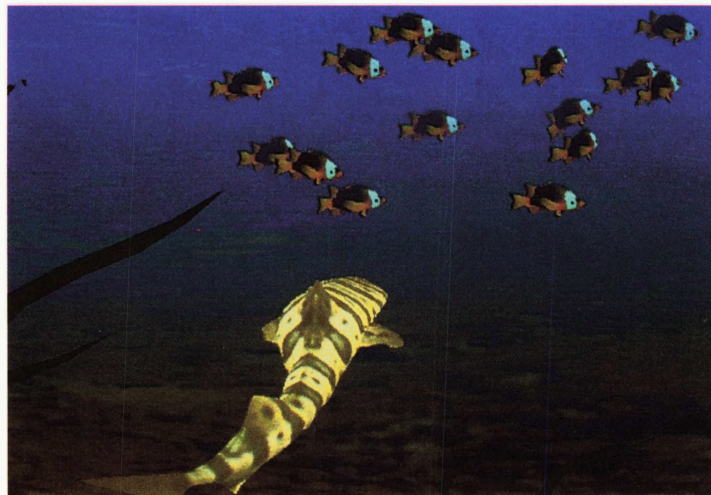
I . U . C . D .

Short personal work created on an IBM PC with Autodesk 3D Studio.

Leslie Baker
Rhythm & Hues
4724 Lincoln Boulevard
Suite 411
Marina Del Rey, California 90292
USA
+1.310.448.7500
leslie@rhythm.com

Creator: Leslie Baker
Sound Engineer: Simon Cahill
Vocals: Louise Hall

Balls and Blocks is a simple story of prejudice and cooperation. It is a visual allegory in which the title characters overcome real barriers by working together to open the way for a newcomer. The piece is backed by an African-style percussion performance by members of the San Jose Taiko Group and voice over by a group of fourth graders from Burbank, California.

Allen D. Coulter
Coulter Studios
209 North Niagara Street
Burbank, California 91505
USA
+1.818.846.9807
ADCoulter@aol.com

Directed and animated by:
    Allen Coulter
Music by: the San Jose Taiko
    Group
Music Coordinator: Jason
    Mckenna
Recording Engineers: Peter
    Dockendorf and Christopher
    Becker
Voices: Sean Coulter, Christine
    Hedke, Greg Reeves, and
    Megan Rolfes
Recording Engineer: Paul
    Martin
Foley: Jeff Frickman
Title animation: Ed Wizelman
Render support: Will Pickering
    and Brian Haberlin
Software support: Hash
    Incorporated
Character animation created
    in Hash Incorporated's
    Animation Master
Special thanks to: John
    Desveaux

JOHNNY BE
GOOD

In "film noir" style, this piece promotes the use of condoms for safe sex.

Pierre Henon
A.i.i.- E.N.S.A.D
31, Rue D'ULM
75005 Paris
FRANCE
+33.14.326.3635
pierre@ensad.fr

Produced by:
    Arnon Manor, F. Tretout
    A.i.i.- E.N.S.A.D
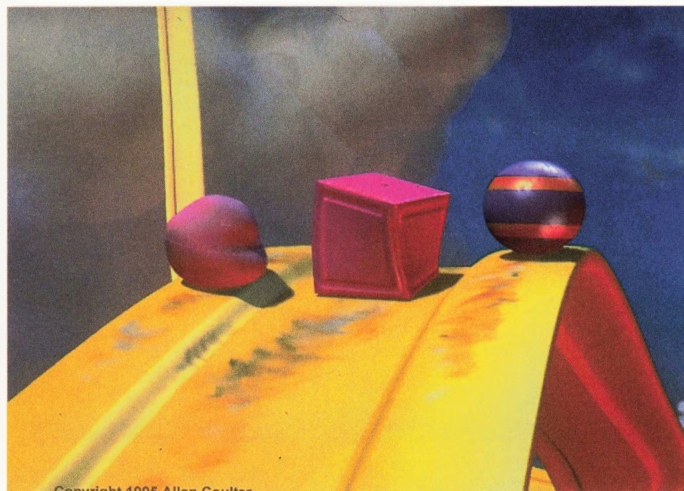
Copyright 1995 Allen Coulter

Until eight months ago, I was designing using only traditional pen, paper, and ink, but all that changed when I was introduced to computer graphics. I created this demo over the past eight months while studying Softimage Creative Environment on an Indigo II.

Satoshi Kitahara

SEGA Enterprises, Ltd.
AM R&D Department #3
1-2-12 Haneda, Ohta-ku
Tokyo, 144
JAPAN
+81.3.5736.7237

Produced by: Satoshi Kitahara
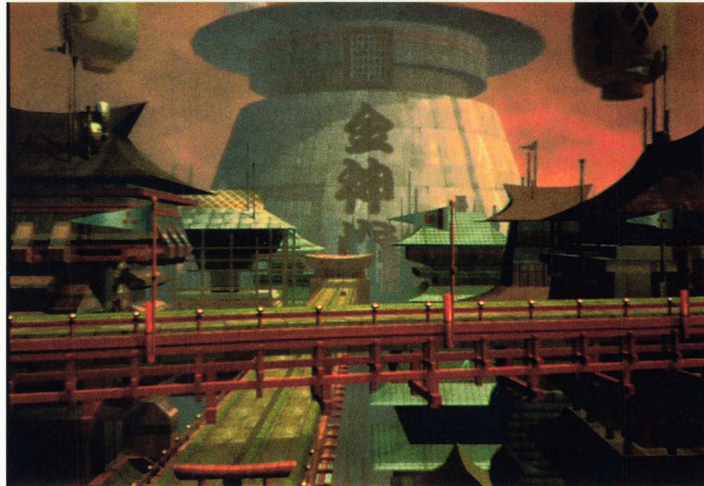
This video describes a laser test facility that has been proposed and designed by Lawrence Livermore scientists and engineers. Computer animation is used to trace the paths taken by the laser and demonstrate the workings of the facility in a relatively non-technical manner.

Michael Loomis

Lawrence Livermore National
Laboratory
P.O. Box 808, East Avenue
Livermore, California 94551
USA
+1.510.422.0364
loomis3@llnl.gov

Produced by: Michael Loomis
    Gene Cronshagen, Alan
    Wardlow, Russell Wilcox,
    Robert Schanilec, Richard
    Servas
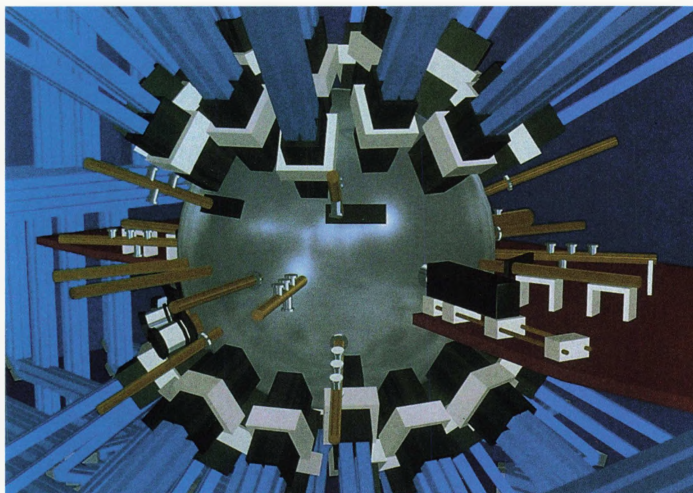
4 DICE

This animation is based on a mathematical model of a four-dimensional die from the point of view of a 4D high-roller who watches Lady Luck whimsically disappear with his winning number.

Andrew J. Hanson
Indiana University
Computer Science Department
Lindey Hall 215
Bloomington, Indiana 47405
USA
+1.812.855.5855
hanson@cs.indiana.edu

Produced by:
    Andrew J. Hanson
Animation: Brian Kaplan
4D modeling: Robert Cross
Video and audio production:
    Eric Ost, David Rust
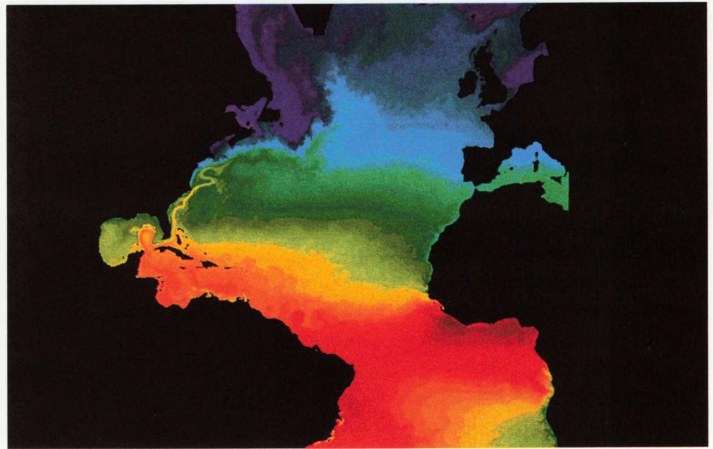
THE MIAMI ISOPYCNIC COORDINATE OCEAN MODEL

The Miami Isopycnic Coordinate Ocean Model animation shows simulated sea surface temperatures of the Gulf Stream, an important North Atlantic current.

Anjana Kar
Greg Foss
Pittsburgh Supercomputing Center
Mellon Institute Building
4400 Fifth Avenue
Pittsburgh, Pennsylvania 15213
USA
+1.412.268.4960
kar@psc.edu

Produced by: Derek Lee &
    Aaron Sawdey
University of Minnesota
    Ocean Movie Team,
    Office of Naval Research,
    Pittsburgh Supercomputing
    Center, United States Army,
    U.S. Department of Energy
Narration: Joel Welling
Software: Miami Ocean Model
Hardware: Cray T3D

Realization of a classic tale of passion and jealousy with the capabilities of modern computer graphics technology, this program is based on a 300-year-old best-selling novel written by Saikaku Ihara. Highly expressive character movements very successfully depict the Edo-era love affair between a man and a merchant's daughter.

Yoshinori Sugano
Nippon Television Network Corporation
14 Niban-cho, Chiyoda-ku
Tokyo 102-40
JAPAN
+81.3.5275.4647

Produced by:
 Yoshinori Sugano
Original story: Saikaku Ihara
Original design:
 Nobuo Kusunok
Script Writer: Satoshi Okonogi
CG Designer: Shigeru
 Yamada, Hiromitsu
 Minota,Noritaka
 Katori,Shinji Aoki,
 Masayuki Sasaki

System Engineer:
 Tohru Fujihara
Music: Daisuke Minamizawa
Editor: Akiko Kurosaki
Director: Yoshinori Sugano

ASTRO CANYON COASTER

Astro Caynon Coaster is a giant roller coaster ride film in a Grand Canyon type of environment somewhere in a theme park on a distant planet.

Ben Stassen
New Wave Entertainment
289 Oudergemlaan
1040 Brussels
BELGIUM
+32.2.649.9406

Produced by:
   TAITO Corporation
Producers: Ben Stassen and
   Mihara Hiromitsu
Production: TAITO
   Corporation/New Wave
   Entertainment
Production design:
   Ray Spencer
Animation: Movida
Key Animator: Anthony Huerta
Sound: Yves Renard, Pierre
   Lebecque

Where Do Cows Go? is a humorous depiction of the relationship between a man and a cow. The animation is accompanied by an original soundtrack with spoken and sung narrative. Added text corresponds with the narrative, which can be described as thoughtful and heartfelt reflections about a dead cow. The combination of comical images and a serious interpretation of the tougue-in-cheek narrative gives Where Do Cows Go? a quirky sense of ambiguity.

Maria Palazzi
Ringling School of Art and Design
2700 North Tamiami Trail
Sarasota, Florida 34234
USA
+1.813.351.4614x7574

Concept and animation:
   Ed Gavin
Music Composers: Ken
   Dunleavy, Bill Hunt
Audio mix: Ed Gavin
Facility Advisor: Ed Cheetham
Video/audio support:
   Philip Chiocchio

This Supercuts commercial combines live-action background photography with a computer-generated comb and scissors to create high-quality, carefully choreographed character animation for the dancing duo. They interact with their world by visually integrating with their environment.

Tom Williams
Industrial Light & Magic
P. O. Box 2459
San Rafael, California 94912
USA
+1.415.258.2000

Produced by: Industrial Light & Magic

Director: Steve Beck
Producer: Paul Hill
Director of Photography: Andy Dintenfass
Digital Effects Supervisor: George Murphy
Animators: Tim Harrington, Colin White, Patrick Bonneau

Digital Effects Artists: Steve Bragg, Jim Mitchell, Tim McLaughlin, Mike Amron, Alia Agha
Match Mover: Raul Essig
Model building: Stewart Lew, Paul Theren
Electronic editorial: Kerie Kimbrell
Sound design: Dennis Leonard, Skywalker Sound
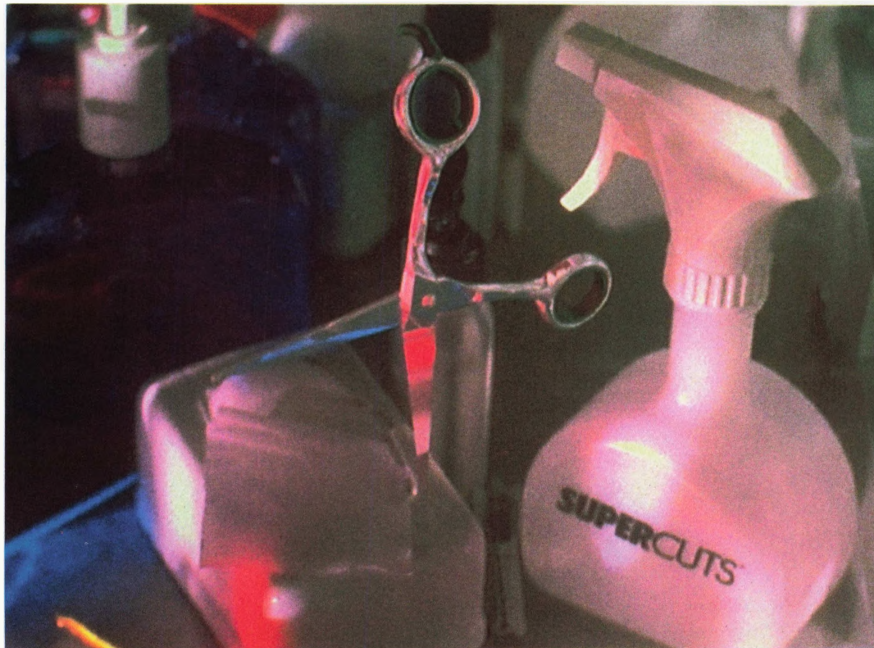
Chicago Blues was achieved with a combination of new technologies and classical techniques. The animation was performed with "traditional" computer animation and utilized old-fashioned cel character animation in the design stage. No motion-capture was used. The environment is a miniature set that was photographed, then composited with CG elements.

Mark Voelpel
R/Greenberg Associates, NY
350 West 39th Street
New York, New York 10018
USA
+1.212.239.6767
mark@rga.com

Produced by: Bob Swenson
Executive Producer: Nancy Bernstein
CG Director: Mark Voelpel

CG Designer: Sylvain Moreau, Irene Kim
Lead CG Animators: Doug Johnson, Sean Curran, Steve Mead, Fred Nilsson, Steve Blakey
CG Animator: Edip Agi
Lead CG Artists: Rafael Castelblanco, Ed Manning
CG Artists: Bart Dority, Scott Prior

Technical Director: Sylvain Moreau
CG Coordinator: Leslie Schor
Custom software: Daniel Reznick
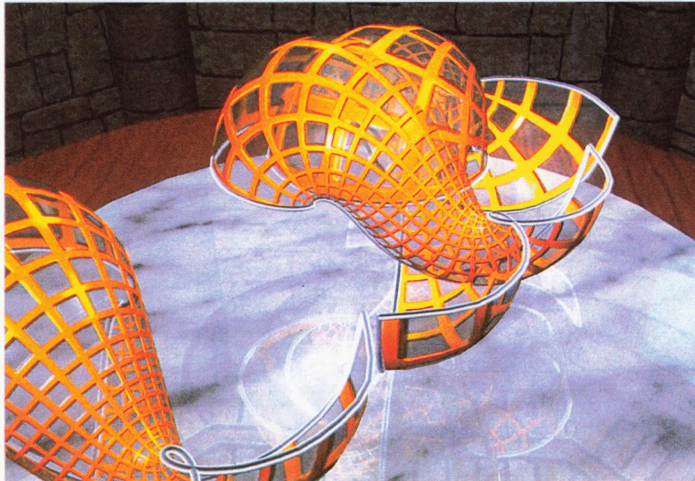
CMC- PICTURES OF CONSTANT MEAN CURVATURE TORI

This musical guided tour highlights the beautiful world of constant mean curvature surfaces (generalizations of minimal surfaces). The viewer is led step by step through construction of three recently discovered examples. Each is built from a single piece of surface through choreographed symmetry operations supported by visualization techniques that clarify the elegant self-intersecting structures.

Matthias Heil
Sfb 288, Technical University Berlin
FB Mathematik, MA 8-5
Straße des 17. Juni 136
D-10623 Berlin
GERMANY
+49.30.31425737
matt@math.tu-berlin.de

Produced by: Matthias Heil,
    Christof März

A flight in from outer space to Hawaii, then under water across the Pacific to the Mariana Trench. Created for the Ocean Planet exhibition at the Smithsonian Institution's National Museum of Natural History. Generated from real topographic data and satellite imagery.

Dave Pape
EVL/UIC
m/c 154, 851 South Morgan,
Room 1120
Chicago, Illinois 60607
USA
+1.312.996.3002
pape@evl.eecs.uic.edu

Produced by:
    Dave Pape, EVL/UIC
    Gene Feldman, NASA/GSFC
    Pam O'Neil, Hughes STX
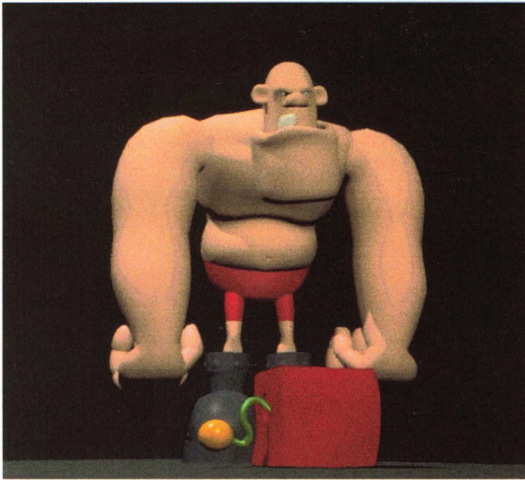
TINY

As a first-year animation student, I produced Tiny as a simple "bang-clunk" type cartoon. The challenge was to make the software's basic modeling and animation packages shape and move a humanoid character.

Paul Kevin Thomason
Texas A+M University Visualization Lab
811 Harvey Road #11
College Station, Texas 77840
USA
+1.409.845.3465
kt@viz.tamu.edu

Produced by:
   Paul Kevin Thomason,
   Kipp Aldrich, Jeff Griswold

TELEOS is a rapid, powerful tool for the creation of real-time interactive virtual environments containing the physical and physiological realism necessary for surgical simulation. The real-time features include particle systems, tactile feedback device support, collision detection, stereoscopic display, and a simulation engine.

Gregory L. Merril
High Techsplantations, Inc.
6001 Montrose Road, Suite 902
Rockville, Maryland 20852-4874
USA
+1.301.984.3706
Gmerril@ht.com & Martin@ht.com

Produced by:
   Gregory L. Merril
High Techsplanatations'
TELEOS Core Technology
Group: Gerry Higgins,
   Dwight Meglan, Gregory
   Merril, Jonathan Merril,
   Alan Millman, Bihn
   Nuygen, Rakesh Raju,
   Shankar Swamy
3D input device development:
   Immersion Corp., High
   Techsplantations, Inc.
Computer hardware: Silicon
   Graphics, Inc.
Software: TELEOS
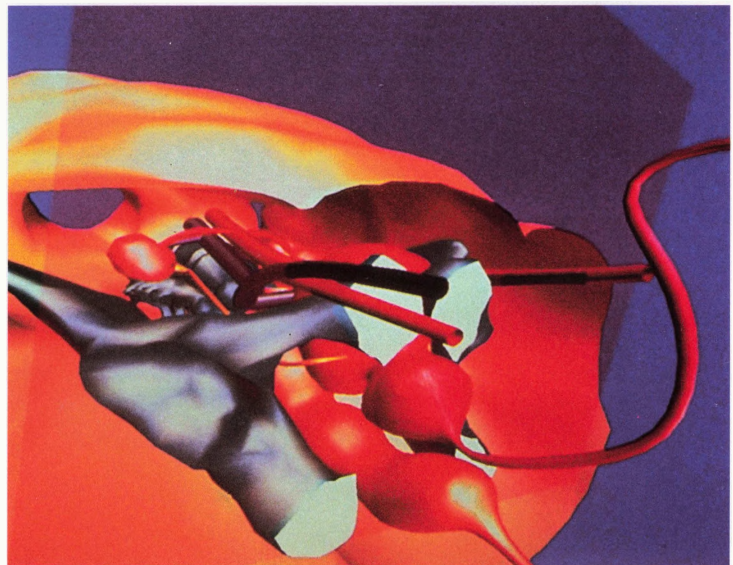
Shannon Stone
Angel Studios, Inc.
5962 La Place Court, Suite 100
Carlsbad, California 92008
USA
+1.619.929.0700
shannon@angel.com
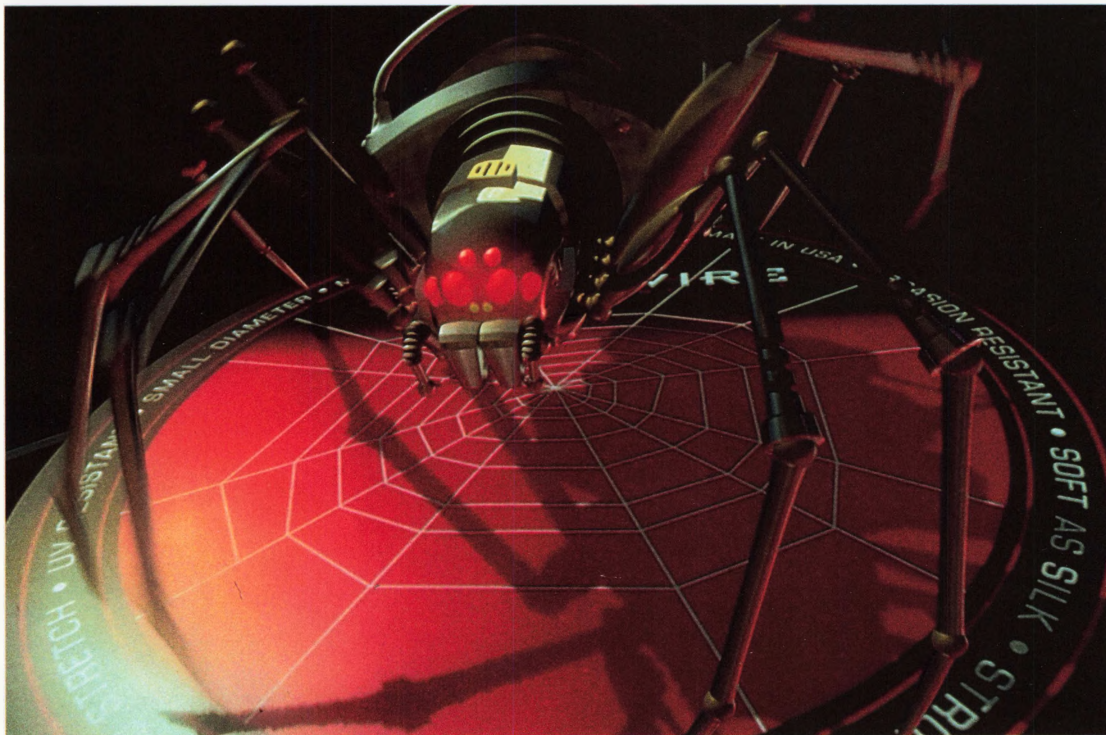
LANCIA DEDRA
SW

Sophie Brun
EX MACHINA
22, rue Hegesippe Moreau
75018 Paris
FRANCE
+33.1.44.90.11.90

Produced by:
   Cristina Nardi, Film Master
   Anna-Karin Quinto, Ex
   Machina
   Natashia Ravlic
Direction: Dario Piana
Client: Fiat Pubblicita e
   Immagine
Agency:
   Armando Testa Milano
Production:
   Film Master Milano
Special effects: ExMachina
Camera capture: Synthetic TV
Special effects team: L. Adam,
   M.Bellan, L.Basurto,
   Ph.Billion, P.Brault,
   V.Boisnard, O.Cotte,
   O.Daniel, J.Gordon,
   F.Lafitte, P.Pestel, F.Place,
   F.Ploye, D.Poiroux,
   F.Schmidt, V.Weil

In this tape, units of texture, called cells, grow, divide, and interact with each other to create 3D textures. Technical details are described in the SIGGRAPH 95 paper "Cellular Texture Generation" by Fleischer, Laidlaw, Currin, and Barr.

Kurt Fleischer

California Institute of Technology
391 South Holliston Avenue
Pasadena, California 91125
USA
+1.818.395.2820
kurt@druggist.gg.caltech.edu

Produced by: Kurt Fleischer
Contributors: Alan Barr, Cindy Ball, Allen Cororran, Bena Currin, Dan Fain, Kurt Fleischer, David Laidlaw, Alf Mikula, Mark Montague, Preston Pfarner, Ravi Ramsamoorthi, Erik Winfree, Denis Zorin
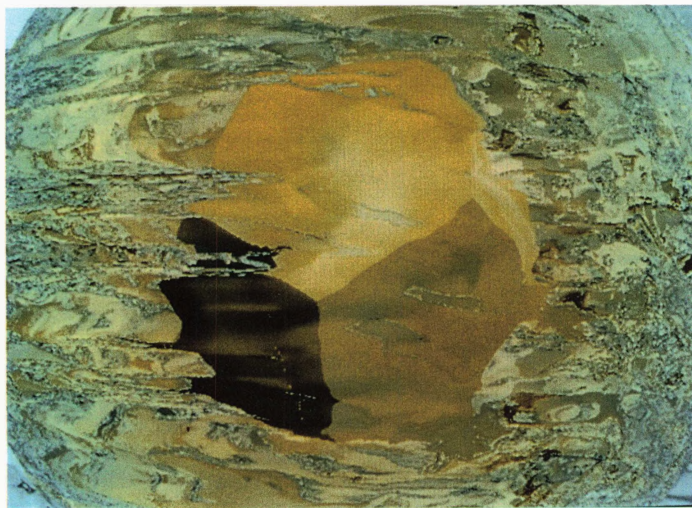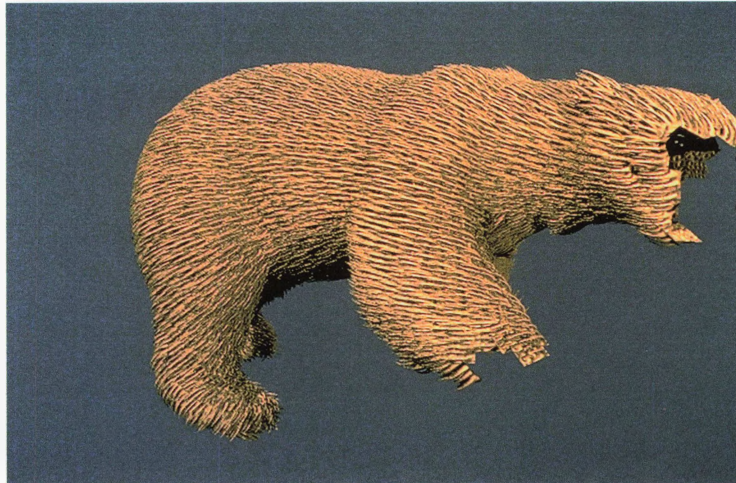
This animation can be seen as a journey through the alchemy that is relaying us to the central spheres where all the energies take shape. Using abstract imagery, it's a continuous burst through all the concentric fences we all build up to protect our intimacy.

Denis Lelong

California Institute of the Arts
24700 McBean Parkway
Valencia, California 91355
USA

11 Rue des Tanneries
75013 Paris
FRANCE
+33.1.45.355.478
denis@smithers.calarts.edu

Produced by: Denis Lelong
Music: Kent Clelland
Editing: Mariela Cádiz

MODUS OPERANDI

This is part of a project called Modus Vivendi (Way of Life) depicting the evolution of human consciousness to the present day and beyond. It explores new ways of sharing insights into quantum physics and the influence of mind on "reality."

Aiko S. Veiga
Zoe Productions
92 Piper Lane
Fairfax, California 94930
USA
+1.415.454.3661

Produced by:
    Beny Tchaicovsky
    Aiko S. Veiga
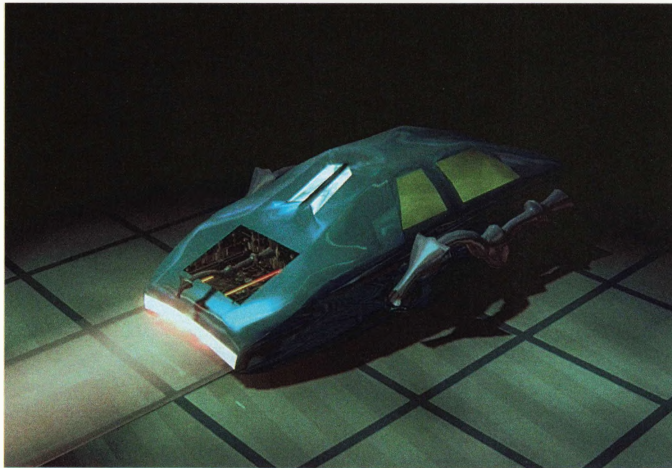
IMPROVISATIONAL ANIMATION

Our improvisational animation research explores human-like agents that interact in real time over networks while expressing believable motion, and personal and social behavior. Applications include role-playing games, simulated conferences, "clip animation," graphical muds, and interactive television.

Ken Perlin
Media Resarch Lab, NY University
715 Broadway, Room 1224
New York, New York 10003
USA
+1.212.998.3386
perlin@nyu.edu

Produced by: Ken Perlin
Contributors: Leo Cadaval, Tim
    Cheung, Troy Downing,
    Athomas Goldberg, Mehmet
    Karaul, Andruid Kerne, Kuo
    ChenLin, Jon Meyer,
    Ruggero Ruschioni, Toledo
    Santos, Daniel Wey,
    Marcelo Zuffo

GOLDEN PLUMP

Falling out of the clouds, we fly over the medieval city of Amiens, then into the 13th-century Cathedral in a dramatic path down through the roof. The master builder comes to life to create the sacred geometry of the Cathedral.

Rory O'Neill
Columbia University
400 Avery Hall
New York, New York 10027
USA
+1.212.854.1842
ro32@columbia.edu

Turning the jolly Santa Claus, an overstuffed chair, and a blimp into a live chicken involves some trickery. Lamb and Company achieved the final graphics and composite using 3D Wavefront software and Flame.

Produced by: Audrey Robinson
Contributors: Larry Lamb, Jake Parker, Mark Youngren, Chris Immroth, Sally Wagner, Cathy Ostlie, Karen Peterson, Greg Winter, Mike Monten, Barth Ward, Matthew Marquis, Lindy Wilson

Milton Rodregues
Lamb & Company
650 Third Avenue South,
Seventeenth Floor
Minneapolis, Minnesota 55402
USA
+1.612.333.8666
milton@lamb.com

WILD ARCTIC:
AVALANCHE

T wo polar bear cubs try to drag their Christmas tree to their den, and when they run into trouble, Mom comes to the rescue. They celebrate with an ice cold Coca-Cola.

A harrowing ride through a dangerously narrow canyon, avoiding the onslaught of a massive avalanche. Composited with film of glaciers. Produced with SGI running Softimage CE with Particle and Minerva. Rendered in HD.

Suzanne Datz
Rhythm & Hues Studios
5404 Jandy Place
Los Angeles, California 90066
USA
+1.310.448.7500
suze@rhythm.com

Paul Scott
digital artworks
2295 Coburg Road, Suite 104
Eugene, Oregon 97401
USA
+1.503.344.6541
Artworks@efn.org

Produced by: Kristina Reed
Director: Dan Quarnstrom
Animation Director:
    Larry Weinberg
Head Technical Director:
    Georgia Cano

For digital artworks: Paula
    Conn, Erik Johnson, Todd
    Kesterson, David Lang,
    Andy Larkin, Sunny Liau
For Midland Productions: Yas
    Takata, Larry Strothe
For Busch Entertainment Corp.:
    Eric Miles
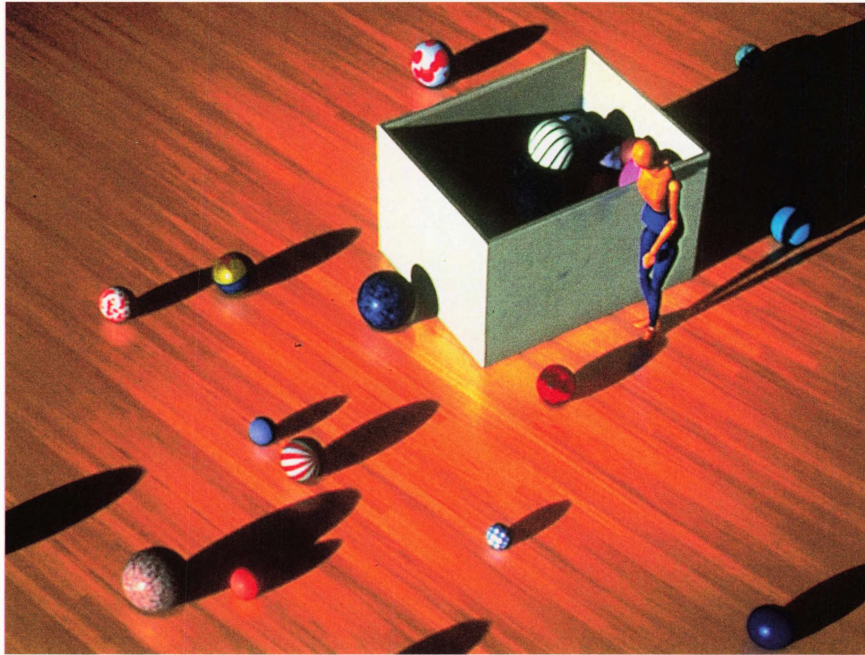
WOMAN
GETTING WHAT
SHE WANTS

In this spot from the Levi's 1994 campaign for Jeans for Women, the Levi's woman is a wooden artist's mannequin. Undaunted by many past failures, she searches through a box full of decorated balls until she finds the perfect one. The expressive animation portrays enthusiasm, disappointment, surprise, caution, and delight in character without facial features.

Kori Rae
Pixar
1001 West Cutting Boulevard
Richmond, California 94804
USA
+1.510.215.3420
kori@pixar.com

Pixar:
Produced by: Darla
   Anderson
Animation/Art Director:
   Jan Pinakava
Technical Director: Don
   Schreiter
Assistant Producer: Kori Rae
Creative Director: John
   Lasseter
Executive Producer: Darla
   Anderson
Technical Contributors:
   Oren Jacob, Mitch Prater,
   Cynthia Dueltgen, Keith
   Gordon
Animators: Jan Pinkava,
   Michael Belzer,
   Andrew Schmidt

Output: Cynthia Dueltgen
Sound effects/Music: Music by
   Tom Meyers, Skywalker
   Sound
Video post: Western Images

FCB/SF:
Producer: Iliani Matisse
Art Director:
   George Chadwick
Copywriter: Mimi Cook
Account Supervisor: Tracy
   Wheeler
Client Rep.: Jim Chriss

For Species, the Boss Films visual effects team used proprietary in-house motion capture software and hardware in conjunction with other programs (Wavefront, Softimage, Renderman) to help augment animation of a highly detailed computer-generated creature designed by H. R. Giger.

Bob Mazza
Boss Film Studios
13335 Maxella Avenue
Marina Del Rey, California 90292
USA
+1.310.823.0433

Visual Effects Supervisor:
   Richard Edlund

Dies Irae, or Day of Wrath, is a surrealistic look at the chaos that ensued during the height of the Bubonic Plague in mid-14th-century Europe. The piece reflects a fundamental irony from the perspective of the plague victim. It takes the viewer through the terrifying experience of a plague victim who is not dead. The concept of the medieval wheel of fate symbolizes the inevitability of the victim's demise.

Maria Palazzi
Ringling School of Art and Design
2700 North Tamiami Trail
Sarasota, Florida 34234
USA
+1.813.351.4614x7574

Concept: Brad Booker, Chris Stone, Matt Trueman
Animation: Brad Booker, Chris Stone
Musical composition: Brad Booker, Chris Stone
Faculty Advisor: Claudia Cumbie-Jones
Video/audio support: Philip Chiocchio
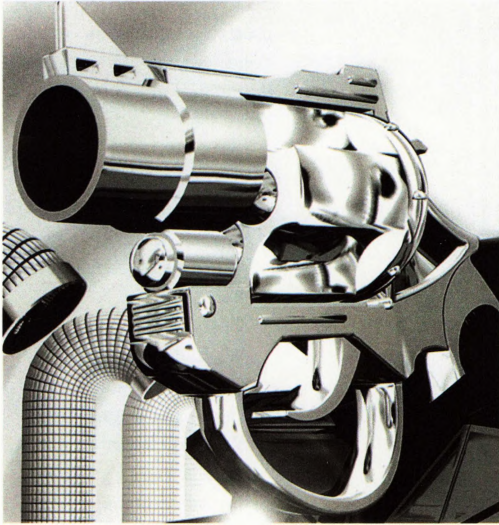
MISTER
GUNHEAD

Short personal work created on an IBM PC with Autodesk 3D Studio

Leslie Baker
Rhythm & Hues
4724 Lincoln Boulevard
Suite 411
Marina Del Rey, California 90292
USA
+1.310.448.7500
leslie@rhythm.com

Creator: Leslie Baker
Sound Engineer: Simon Cahill

Deep is a computer animation which questions seeing and learning to see. Skeletons all look alike, but when we see the skin we know what to expect. The basic material is a human being, animals, and organic materials. When the whole figure is cut into pieces and X-rayed, what is left is nothing but the same kind of forms, shapes, movements, and materials. All the same particles are found in every living thing, so we all are physically nearer to each other than we sometimes want to remember.

Milla Moilanen
Kroma Productions Oy
Magnusborg
06100 Forvoo
FINLAND
+358.15.585.900

Produced by:
   Kroma Productions Ltd
Script and direction: Milla
   Moilanen
The Dancer: Alpo Aaltokoski
Editing: Raimo Uunila
Animation: Milla Moilanen
Photographs: Keijo Kivioja,
   Milla Moilanen
Music: Miikka Kari, Epa
   Tamminen
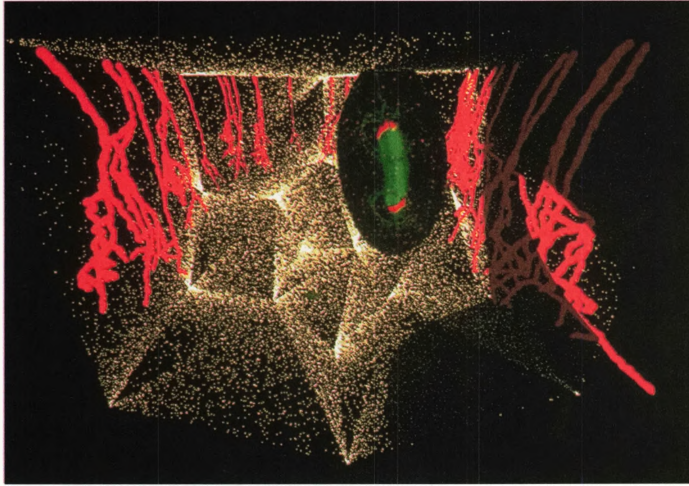
DE ANIMA

New imaging technology claims to participate not only in the production of art, but also in creation itself. A dynamical system, which was initially developed by ARSCIMED for simulation and visualization of elementary particles in quantum theories, is used here to generate "soul as substance," as described by the classics.

Eyal Cohen
ARSCIMED
100 Rue Du FBG ST Antoine
75012 Paris
FRANCE
+33.1.4473.9000
ascm@world-net.sct.fr

Produced by: ARSCIMED
A film by Karl Lerch
Computer graphics:
    Christine E. Chang

An ad for an insecticide, where the star is a mosquito with a human head. The technique used to integrate the actor's head with the 3D model gave the animators full freedom to move the character.

Translation of dialogue
    Mosquito: Wow! The TV! I won't miss it... Let's start with a good head-knock on the screen... (CRASH!)
    Mosquito:(laughs)
    Mosquito: It seems she's angry.. But I got a great idea.. a hostage!
    Mosquito:Listen! I have the kid with me! If you spray me with that thing your child will have a bad time! And we don't want that, true?
    Kid: Pull the trigger, mother, do it, don't hesitate!
    Mosquito: The chick's crazy! (falls)
    Locutor: Blah, blah.
    Mosquito: I'm about to die, son. Just remember me as a fool who wanted to fly (dies).

Juan Bühler
Imagica S. A. Fabián Galvez
San Lorenzo 3845
1636 Olivos
Buenos Aires
ARGENTINA
+54.1.794.7300
imagica@usina.org.ar

Produced by: Imagica S.A. for Flehner Films, Juan J. Bühler and Fabián Galvez
Modeling, animation, shading, integration: Juan Bühler/Fabián Galvez
Production coordination: Martin Malamud
Direction: Edi Flehner

TRANSFORMERS
COMPILATION

Floyd Gillis
AFCG, Inc.
305 East 46th Street, 8th floor
New York, New York 10017
USA
+1.212.688.3283
fgillis@afcg.nyc.ny.us

Produced by: AFCG, Inc. and
   Tape House Digital

Animation and composing:
   Floyd Gillis, Steve Blakey,
   AFCG, Inc.
Video post & composing:
   David Berker, Tape House
   Digital
Executive Producer: Karen
   Stewart, Tape House Digital
Live action: Firehouse Films
Client: Hasbro Toys

Agency: Griffin/ Bacal
Agency Creative Director:
   Loyd Goldfine
Agency Producer: Danny Liner
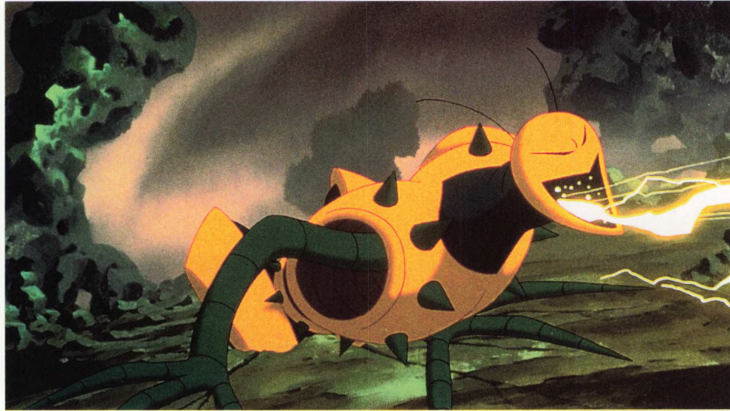
PRELUDE TO EDEN

A short film created with the Amino computer system. Features high-quality animation from hand-drawn art and effects created with the Amino Vector capabilities. The story is a science fiction fantasy.

Richard Ashton
Cambridge Animation Systems
20 Cambridge Place
Cambridge CB2 1NR
UNITED KINGDOM
+44.01223.311.231
richard@cam-ani.co.uk

Director and Producer:
   Michel Gagne
Art Director: Barry Atkinson
Backgrounds: Barry Atkinson,
   Sean Sullivan, Bob Simmons
Animation: Michael Gagne
Additional animation: Nasos
   Vakalis, Mark Koetsier, Dave
   Brewster, James Mansfield,
   Kevin Johnson
Sound: Joe Campagna
Music: Shirley Walker

BASKETBALL

A basketball player and "Granny" play a game of one-on-one, but instead of playing with a ball, they're dribbling and shooting household products like rolls of paper towels. Lamb and Company supervised the product replacement live-action shoot and used Flame to seamlessly replace the ball with products and perform the final composite.

Milton Rodregues
Lamb & Company
650 Third Avenue South,
Seventeenth Floor
Minneapolis, Minnesota 55402
USA
+1.612.333.8666
milton@lamb.com

Produced by: Audrey
   Robinson
Contributors: Jake Parker,
   Kathy Lally, Chris Preston,
   Jim Henderson, Eric Young,
   Dan Rodwell, Mathew
   Marquis, Bob Wickland,
   Tom Lecher, Dale Goulet
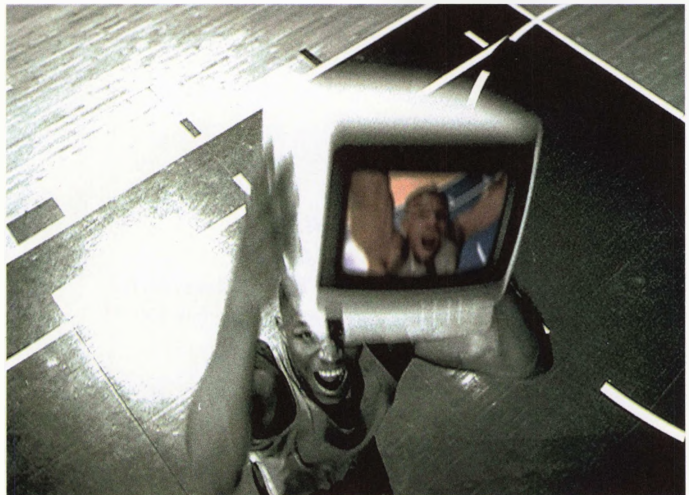
A combination of live action and CGI. In the spot, small CGI fish mingle together to form a shark.

Suzanne Datz
Rhythm & Hues Studios
5404 Jandy Place
Los Angeles, California 90066
USA
+1.310.448.7500
suze@rhythm.com

Produced by: Ken Roupenian
Director: Randy Roberts
CGI Director: Kerry Colonna
Head Technical Director:
    Michael Tigar

ATLANTA IN
MOTION

Control algorithms are applied to a physically realistic model of humans to compute the motion of athletes as they run, dive, vault, bicycle, lift weights, and perform on the uneven bars and rings. The motion of the splash created by the diver and the sweatpants worn by the runner are also dynamically simulated.

Jessica Hodgins
Georgia Tech
Graphics
Visualization & Usability Center
College of Computing
801 Atlantic Drive
Atlanta, Georgia 30332-0280
USA
+1.404.894.9763
jkh@cc.gatech.edu

I use this piece to search for equilibrium between my interests in the "natural" realm and my use of computers. Through this animation, I consider issues of productivity and adaptation in relation to one's environment.

Kim White
4417 South 136th Street
Seattle, Washington 98168
USA
+1.206.248.2496

Produced by: Kim White

THE NATIONAL LOTTERY LAUNCH

The National Lottery Launch features 20 complex layers of computer graphics integrated with live action pyrotechnics, 2D animation and Flame optical effects. The CG effects were achieved in Prisms software and Pandemonium tools.

Justin Greetham
Lost In Space
78 Liverpool Road
Islington, London
UNITED KINGDOM
+44.0171.704.9810
justin@lostinspace.com

Produced by: Passion Pictures
   Christian Hogue, Lost In
   Space,
   Shireen Armstrong, Lost In
   Space
Special Effects Supervisor:
   Christian Hogue
3D Animators: Christian
   Hogue, Sally Goldberg,
   Andrew Quinn, Harry
   Nicholas, Steve Barnes,
   Indira Guerandi, Paul
   Simpson
Producer: Shireen Armstrong
2D animation: Passion
   Pictures, Alan Dewhurst,
   Chris Knott

HOUSEHOLD HELP

This piece started as a senior film at CalArts in 1993. It combines traditional hand-drawn animation incorporated into a 3D computer-animated environment.

Steve Ziolkowski
Rhythm & Hues Studios
5404 Jandy Place
Los Angeles, California 90066
USA
+1.310.448.7500
stevez@rhythm.com

Produced by: Steve Ziolkowski
Music: Chris Senn
Editing and sound:
    Brent Young
Co-author: Maria Rodrigues
Tape Operators: Karen Bruner,
    Johan Michaud
Additional: Larry Weinberg,
    Jay Redd, Sean Jackson
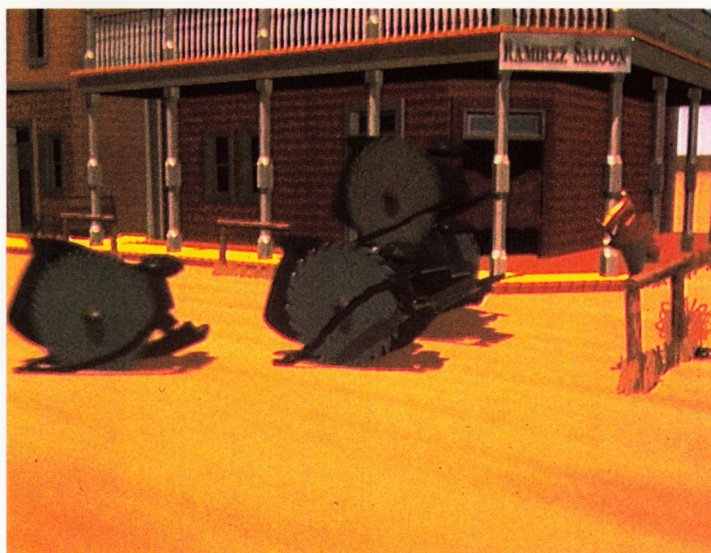
PLUG OUT OF LUCK

Entertainment animation featuring confrontation of bad and good, set in the Old West, with a twist.

John W. Lees
JUUL: ANIMATION LTD.
1312 Norfolk Drive Northwest
Calgary, Alberta T2K 5P6
CANADA
+1.403.295.3417
leesjw@cadvision.com

Produced by:
    John W. Lees
    Bryan Ewert
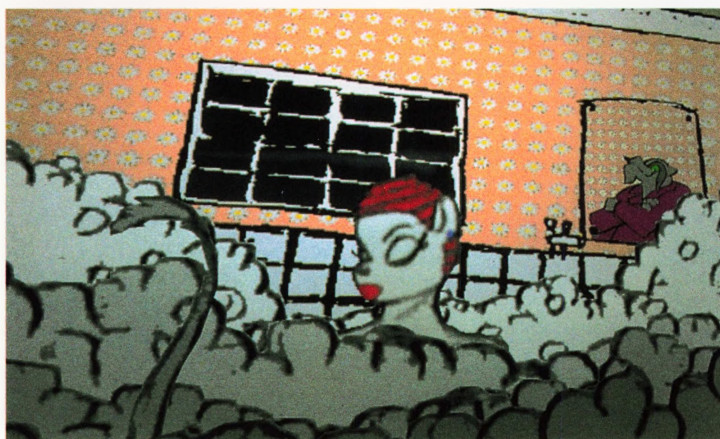
The Sandbox (scientists accessing necessary data based on experimentation) allows scientists to retrieve data from a scientific database by virtually recreating experiments, which gives the user a more familiar way of extracting data.

Andrew Johnson
Electronic Visualization Laboratory
University of Illinois at Chicago
M/C 154
851 South Morgan, Room 1120
Chicago, Illinois 60607
USA
+1.312.996.3002
aej@evl.eecs.uic.edu

Produced by:
   Andrew Johnson,
   Jason Leigh, Tom DeFanti,
   Farshad Fotouhi
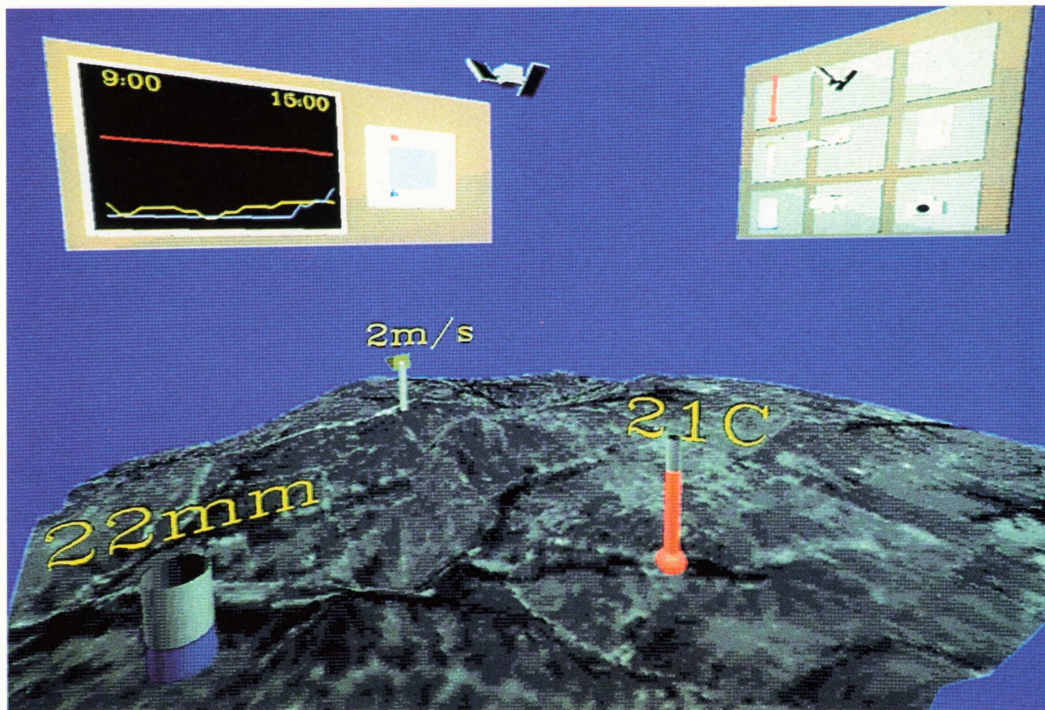
The scene of the mausoleum of Qin Shi Huang.

Kunio Kida
Taisei Corporation
1-25-1 Nishi
Shijuku Shinjuku-ku
Tokyo, 163-06
JAPAN
+81.3.5381.5403

Producers: Yuichi Funakoshi
    (NHK), Kunio Kida (Taisei
    Corp.)
Assistant Producer: Yasutaka
    Oshiro (Taisei Corp.)
Director: Tomohide Terai
    (NHK), Osamu Ishizawa
    (Taisei Corp.)
Computer graphics: CGPL
    (Computer Graphics
    Presentation Lab in Taisei
    Corp.)
Hyper Paint: Chinsatsu Fukuda,
    Kanako Aoki
Modeling: Yasuyo Iwata
Modeling/rendering/
animation: Osamu Ishizawa,
    Sigeki Yoshida, Kanako
    Aoki
System support: Yasuhiro
    Aikawa
Sponsor: Taisei Corp.
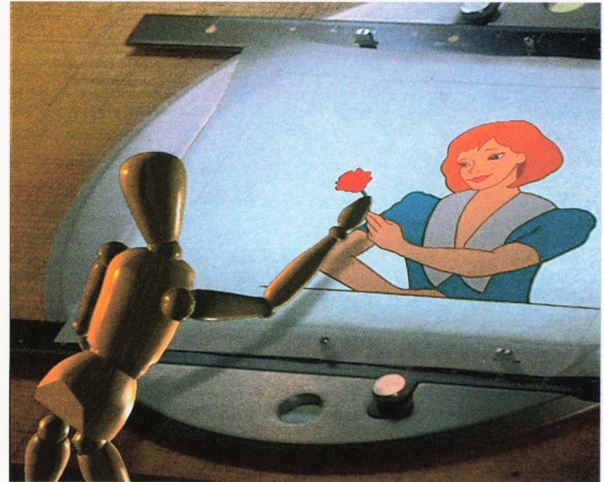
AVERY

My goal was to develop a simple story that would marry 3D and 2D together in a live-action environment. The challenge was to bring to life a whimsical romance between a faceless, woodcarved mannequin and a beautiful animated girl named Avery.

James Wheless
Wheless Studios
4300 Brookfield Drive
Charlotte, North Carolina 28210
USA
+1.803.547.3800
jawheeless@aol.com

Produced by: James Wheless
Music & sound effects:
    Fred Story
Editing: Kurt Oakley
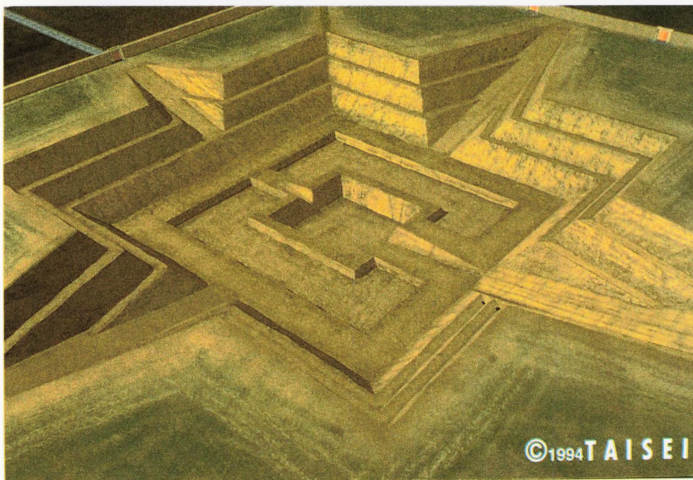
Time for Love is a 3D computer animation about love won, love lost, and love won again. The software was TDI ver.3.03 (animation and rendering). Textures were created in Photoshop and Illustrator. Hardware was Silicon Graphics Indigo.

Carlos Saldanha
School of Visual Arts
115 West 11th Street, Apt.4R
New York, New York 10011
USA
+1.914.941.5260
Carlos@blueskyprod.com

Produced by: Carlos Saldanha
Music: Casey Chester and
    Trevor Clark at Michael
    Levine Music

To achieve the sense of a real train pulling out of a station on a foggy, winter night, Renderman was used to create an atmospheric, snowy landscape and the Dynamation particle system generated smoke and steam from the train. All images were then processed in Flame for a hazy/misty affect to further enhance the feeling that something magical was happening.

Milton Rodregues
Lamb & Company
650 Third Avenue South,
Seventeenth Floor
Minneapolis, Minnesota 55402
USA
+1.612.333.8666
milton@lamb.com

Produced by: Audrey
    Robinson
Contributors: Larry Lamb,
    Gayle Ayers, Chris
    Immroth, Yannis Marcou,
    Milton Rodrigues, Scott
    Gaff, Doug Sutton, Jeff
    Raymond, Mark Youngren,
    Jake Parker, David Ensz,
    Susanne Marks, Tony
    Marks

Product introduction of a new printer by Brother. The design is unique in that the pare path is a straight line. This is highlighted in the spot by schematic arrows composited with live action of the printer. The superiority of the new printer is further and more dramatically illustrated by peering into a CGI world inside a competitor's printer to discover humorously devious creatures called "Glitches," who presumably reside in run-of-the-mill printers. They wreak havoc and destroy documents.

Christina Reyes
Blue Sky Productions, Inc.
100 Executive Boulevard
Ossining, New York 10562
USA
+1.914.941.5260
chrissie@blueskyprod.com

Agency: Milton Samuels
    Advertising
Producer: Barry Shapiro
CD/AD: Richard Ellenson
CD/Copy: Sam Ash

Blue Sky:
Director: Jan Carlé
Executive Producer:
    Alison Brown
Associate Producer:
    Cindy Brolsma
Animators: John Kahrs, Peter
    Carisi, Clifford Bohm
Lighting: John Kahrs, Maurice
    Van Swaaij, Carl Ludwig,
    Hilmar Koch
Modelers: Tom Bisogno, Peter
    Carisi, Clifford Bohm,
    Hilmar Koch
Technical Director: Sam
    Richards, Hilmar Koch,
    Clifford Bohm

Production Assistant:
    Jeremy Goldman

Live Action Director:
    Barry Shapiro
Music: Tonal Images, NY
Editor: Chromavision, NY
Post-production services: HBO
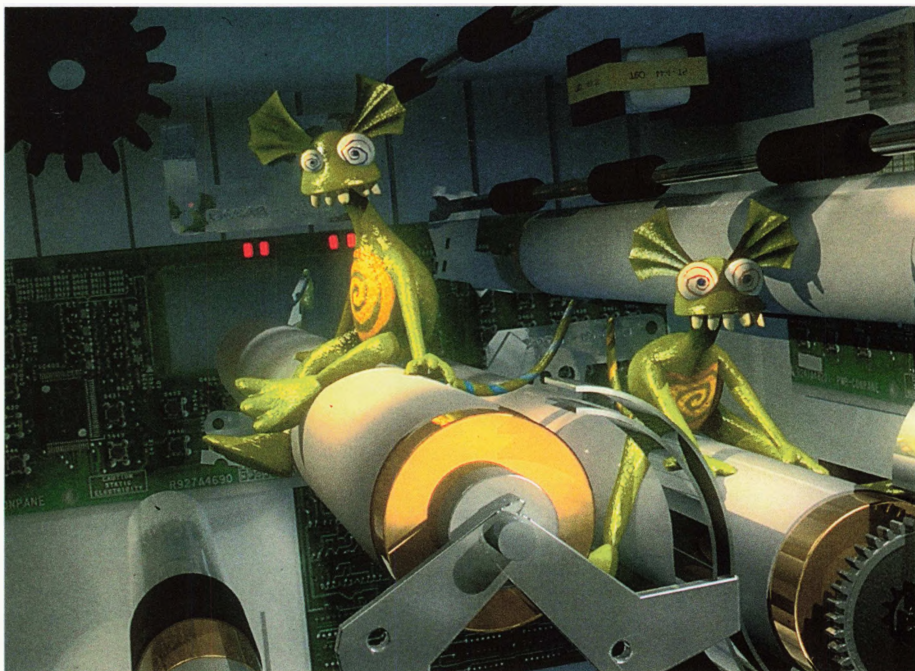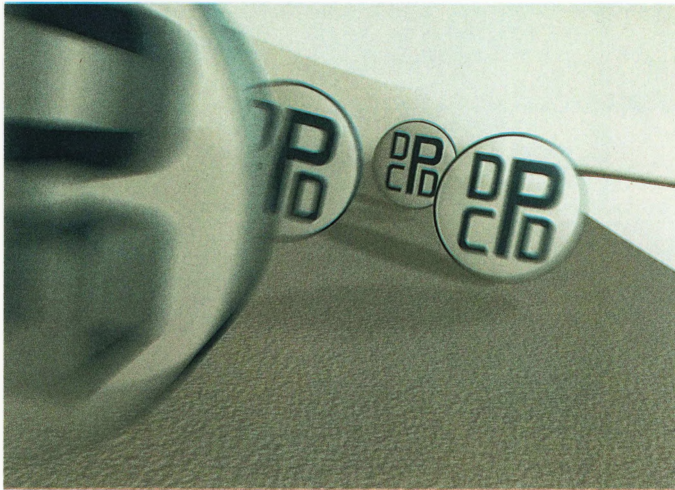
MOPAR, LOGO
HISTORY

In honor of the 60-year history of MOPAR's service to the auto racing industry, their nine logos are animated to illustrate different aspects of auto racing.

Christina Reyes
Blue Sky Productions, Inc.
100 Executive Boulevard
Ossining, New York 10562
USA
+1.914.941.5260
chrissie@blueskyprod.com

Agency: Ross Roy
   Communications
Producer: Jack Nelson
AD: Tony Macioce
Copy: Michael Cannon

Blue Sky:
Producer: Carol Laufer
Director: Jan Carlé
Animator: Steve Talkowski
TD: Mitch Kopelman
Paintbox: John Siczewicz

LOST TIME

Lost Time is, in effect, a personal reaction to the powerful and pervasive impact of broadcast television. Using a variety of collage techniques, combined with digital processing and 3D computer animation, I have assembled an improvised flow of sounds and images designed to produce a surrealistic impression of electric communication media.

Robert Russett
University of Southern Louisiana
P.O. Box 41097 USL
Lafayette, Louisiana 70504
USA
+1.318.482.6434

Produced by: Robert Russett
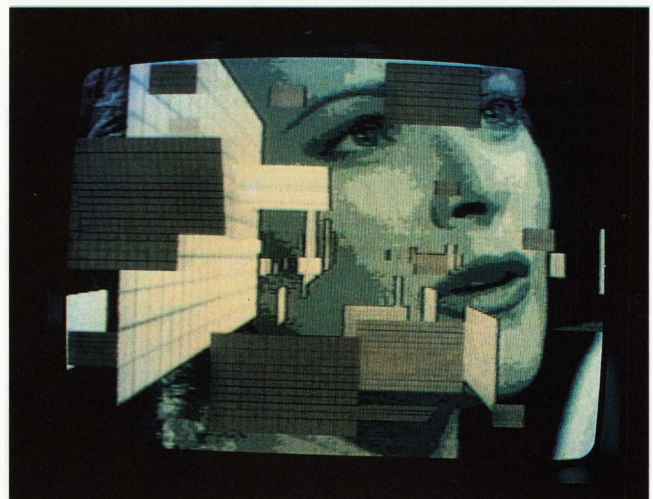
Bahay Kubo is probably the most popular folk song of the Philippines. It is a song that celebrates the bounty of the country. The main goal of this animated project was to promote Philipino songs/stories through computer graphics technology.

Bren Bataclan
The Advanced Computing Center
for the Arts & Design
The Ohio State University
1224 Kinnear Road
Columbus, Ohio 43212
USA
+1.614.292.3416
bataclan@cgrg.ohio-state.edu

Produced by: Bren Bataclan,
    Steve May, and Ferdi
    Scheepers
    The Advanced Computing
    Center for the Arts & Design
    The Philipino American Arts
    Expo
    Teatro ng Tana
    The Ohio State University

A journey through a fictitious town invaded by unidentified flying objects.

David Haxton
William Paterson College Center
for Computer Art & Animation
300 Pompton Road
Wayne, New Jersey 07470
USA
+1.201.595.2722

Produced by: Center for
    Computer Art & Animation
Director: David Haxton
Assistant Director:
    Joseph R. DeGeorge
Technical Director:
    Alissa R. Randall
Production Manager:
    Alan O'Brien
Production Assistant:
    Holly J. Bloom
Faculty Advisor:
    David L. Halbstein

THE FLOOD

This work is composed of a combination of animated 3D computer-generated forms, video clips, and photographs. The computer-created forms invade the space created by the photographic imagery, creating a discord between them and questioning the whole notion of photo realism.

Thomas Sicurella
154 Bonview Street
San Francisco, California 94110
USA
+1.415.821.7490

Produced by: Thomas Sicurella
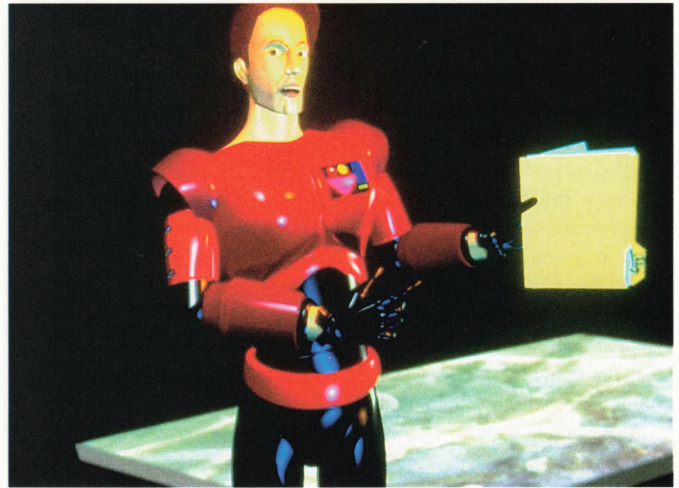
BROKEN RECORDS

The intentions behind Broken Records are to create visually interesting pieces that combine several styles and to make the use of computer animation less conspicuous, so as to emphasize the graphic and design elements. Broken Records pays homage to traditional animation techniques with the subtle application of modern digital effects.

Dreux Priore
Space Monkey Productions
241 Morewood Avenue, Suite 350
Pittsburgh, Pennsylvania 15213
USA
+1.412.682.5529

Produced by: Space Monkey Productions
Contributors: Don Kinney, Bob Mushinsky, Melissa Połakovic, Dreux Priore, Bill Schiffbauer

Dance Fever was achieved with a combination of new technologies and classical techniques. The animation was performed with "traditional" computer animation and used traditional cel character animation in the design stage. No motion capture was used. The environment is a virtual CG set. Custom flare software was developed in-house.

Mark Voelpel
R/Greenberg Associates, NY
350 West 39th Street
New York New York 10018
USA
+1.212.239.6767
mark@rga.com

Produced by: Bob Swenson
Executive Producer: Nancy Bernstein
CG Director: Mark Voelpel

CG Designer: Sylvain Moreau
Lead CG Animators: Doug Johnson, Sean Curran, Steve Blakely, Fred Nilsson, Edip Agi
Lead CG Artists: Irene Kim, Rafael Castelblanco, Ed Manning
CG Artists: Bart Dority, Scott Prior, Jason Strougo
Technical Director: Sylvain Moreau

CG Coordinator: Leslie Schor
Custom software: Henry Kaufman, Daniel Reznick

The symbol on a restroom sign springs to life and travels across the room to meet his mate. PDI animated and seamlessly integrated CGI characters into live-action film footage.

John Robeck
Pacific Data Images
1111 Karlstad Drive
Sunnyvale, California 94089
USA
+1.408.745.6755
jr@pdi.com
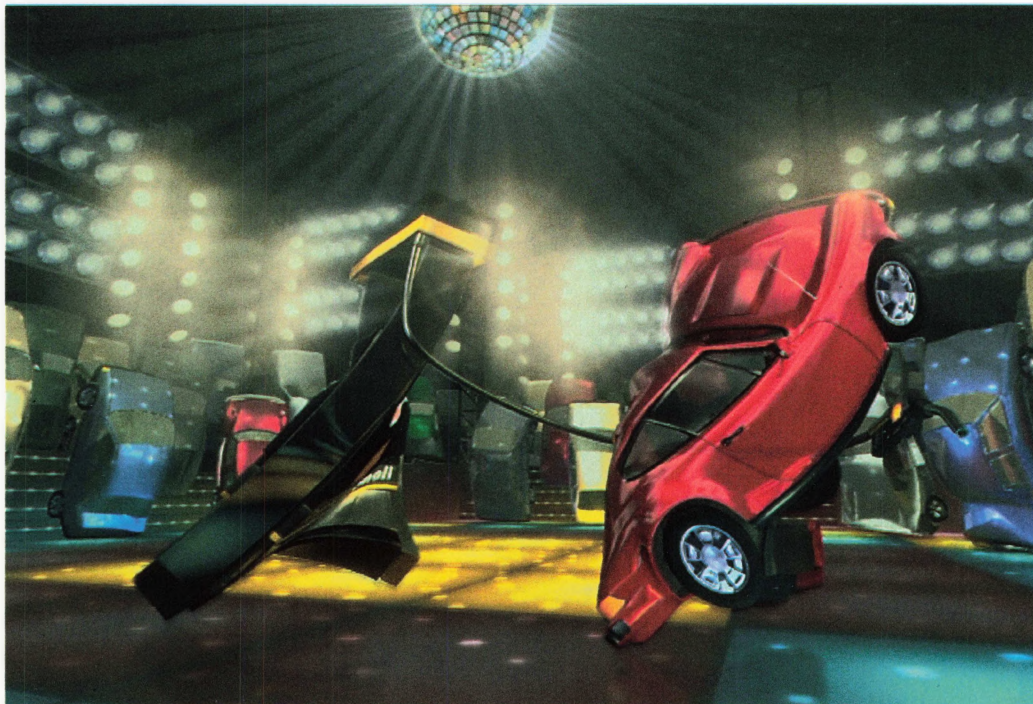
PECOS BILL'S TWISTER FROM THE DISNEY/CARAVAN FILM TALL TALE

The Twister created for Tall Tale is a combination of stage elements shot in a custom wind tank and many 2D and 3D digital elements. The net effect is a photo-real twister that Pecos Bill lassos and rides up into the clouds.

Tim McGovern
Sony Pictures Imageworks
10202 West Washington Boulevard
Culver City, California 90232
USA
+1.310.280.7854

Produced by: Mickey McGovern, Scott Anderson
Contributors: Neil Eskuri, Julia L. Rivas, Adrian Iler, Ron Brinkmann, Scott Kilburn, Andrea Losch, Andrea Sholer, Kelvin Lee, Ivo Horvat, David Douglas, Richard Edwards, Deborah Wiltman

Produced by:
    Pacific Data Images
Director: Tim Johnson
TD: Karen Schneider
Lighting: Philippe Gluckman, Sherry Hsieh
Animators: Rex Grignon, Eric Darnell
Assistant Animator: Noel McGinn
Client: DDB Needham
Producer: Mocica Mooney
Creative Director: Marty Weiss
Live action: Satellite Films
Producer: Oliver Fuselier
Director: Simon West
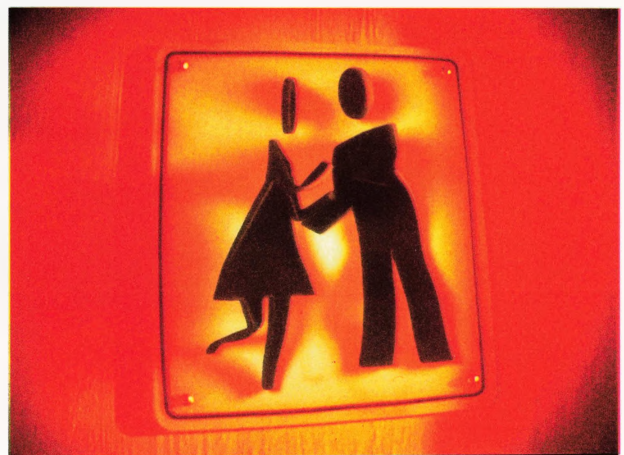
Two pigeons find harmony through self-abuse. The animation is entirely computer-generated. The motion is completed in 3D and then rendered automatically but lovingly as a gestural drawing. No real paper or ink is used in the process. Produced with the support of PDI and the Rubber Bishops.

John Robeck
Pacific Data Images
1111 Karlstad Drive
Sunnyvale, California 94089
USA
+1.408.745.6755
jr@pdi.com
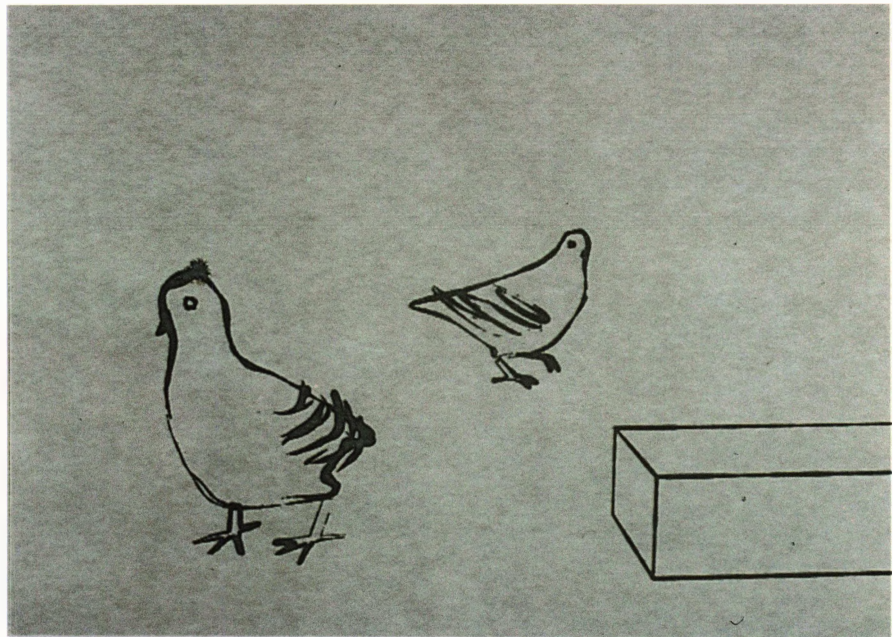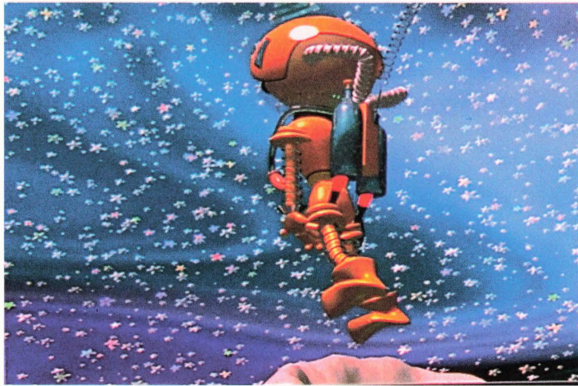
ADVENTURE OF
COMTY

Comty is a cyborg. He fights in the cause of justice with an evil invader.

Tasuya Nakada
DAIKIN Industries, Ltd.
6-1, Shinjuku-Sumitomo Bldg.,
2-Chome,Nishi-Shinjuku,
Shinjuku-ku, Tokyo
JAPAN
+81.03.3344.8119

Produced by:
    DAIKIN Industries, Ltd.
    Monolith Co., Ltd.
    ORACION, Inc.

TANDAV

Shiva, one of the supreme trinity in Hinduism, performs the Tandav dance. Through this dance, Shiva accomplishes annihilation of the world and its integration into the world of spirit. This represents destruction of the illusory world of Maya, the illusion of material reality.

Umesh Shukla
JSP Post Pte Ltd.
322 Circuit Link, Swee Hong
Building
SINGAPORE 1337
+65.745.3788
Umesh@singnet.com.sg

Director and Animator:
    Umesh Shukla
Sound: Mohhamed M. Nor
Henry Editor: Mervyn Lim
Post production: JSP Post
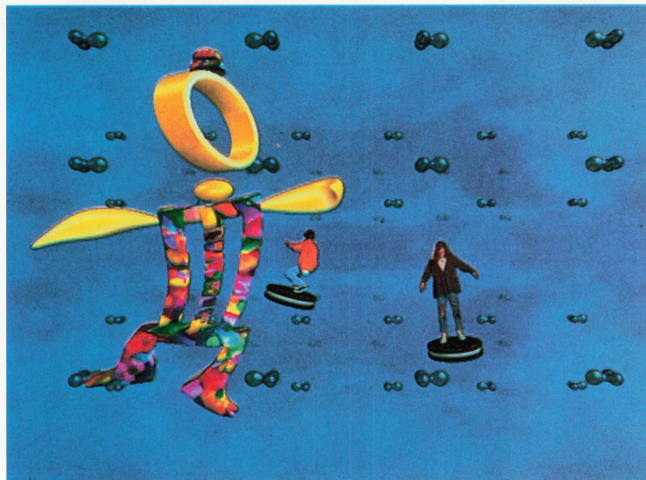
NABISCO THING

Xaos brought to life the Nabisco thing, a 3D animated character who interacts with live-action kids in an imaginary, computer-generated world. The resulting 30-second spot is an interesting blend of techniques, combining live action with character animation, image processing, particle-systems animation, and post production.

Linda Jones
XAOS
600 Townsend Street, Suite 271E
San Francisco, California 94103
USA
+1.415.558.9267
marie@xaos.com

Produced by: XAOS
Creative Director: Mark
    Malmberg
Animators: Agata Bolska,
    David Brant, Maggie
    Hallam, Henry Preston,
    Krzystof Rostek, Chitra
    Shiram, Alex Tylevich
Producer: Susanne Richards
Executive Producer: Helen
    Plotkin

AN ARTIST

A young girl manages to develop her musical talent without the knowledge of her family.

Michele Cournoyer
National Film Board of Canada
Benoit Cote Marketing Officer
French Program Animation Studio
3155 Cote de Liesse
Montréal, Quebec H4N 2N4
CANADA
+1.514.283.9330

Produced by: Therese Descary
Director: Michele Cournoyer
Animation Assistants: Pierre
    Plouffe, Vincent Pontbriand-
    Trudel
Computer Graphics Advisor:
    Ines Hardtke
Computer graphics technical
support:
    Marie-Nicole Tremblay
Digital imaging development
    and operations: Patrick
    Bergeron, Julie Dutrisac,
    Doris Kochanek, Richard
    Martin
Digital titles: Louis Overy
Others: National Film Board
    Digital Imaging Services

*

The viewer is plunged into an area of gears all driven by the efforts of women. The context and the presentation challenge the viewer. I believe this piece would be accepted differently depending on the sex of the creator, something that we all need to think about. All conclusions are the viewer's own, and the piece does not try to make any decisions for the viewer.

Mary Beth Haggerty
Texas A+M University
Visualization Laboratory
216 Langford Center
College Station, Texas 77843
USA
+1.409.845.3465
mbh@viz.tamu.edu

Produced by: Mary Beth
    Haggerty

This video is a journey through the 3D surrealistic mythological universe of Logod, Medialand, DiviGod, the Brainghost... This title was also produced on CD-ROM, as an interactive 3D mythology. The video is a presentation of that digital mythology in a sequential format.

Rodrigo de Toledo
5630 North Sheridan Road,
#1112
Chicago, Illinois 60660
USA
+1.312.907.1873
rtoledo@artic.edu

Produced by: Rodrigo de
    Toledo
Music: Stephen Rose
Lyrics: Rodrigo de Toledo

LATE ARRIVAL

This animation was executed with Alias software and rendered on an Onyx. It is part of a larger body of work dealing with integration of the figure into the digital environment (real and virtual). The piece deals with issues of death and mourning as they are treated by our culture.

Claudia G. Herbst
Imaging Research Center
5025 Williston Street
Baltimore, Maryland 21229
USA
+1.410.455.3373
claudia@irc.umbc.edu

Produced by: Claudia G.
  Herbst
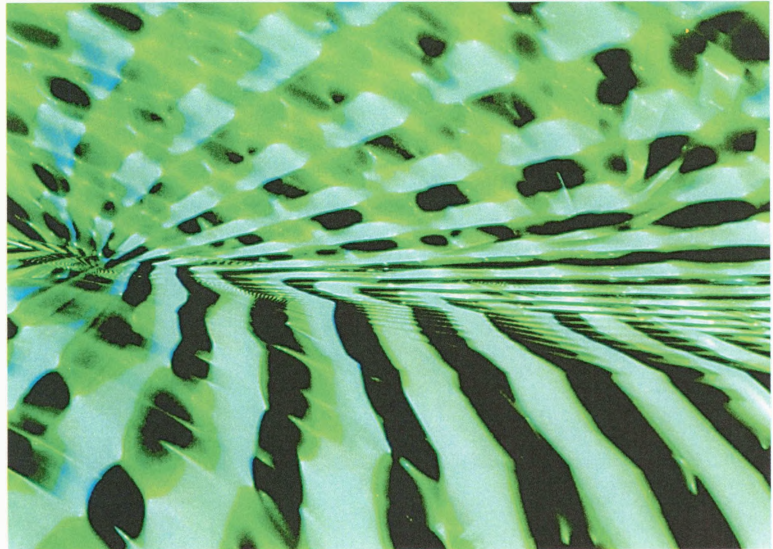
PLEXUS

Plexus is a journey into a plastic fantasy world, where shape and form do not necessarily equate to solidity. The rhythm of sounds and images give some relationship to our world, but only for the purpose of grounding the senses.

Stephen Larson
Syracuse University
P.O. Box 288, University Station
Syracuse, New York 13210
USA
+1.315.423.7978
shlarson@mailbox.syr.edu

Produced by: Stephen Larson

This video clip is a digest of computer graphics that were used in the Japanese television drama "Rampo, mysterious women." "Rampo" is a two-hour drama composed of four episodes. A large portion of one of those episodes consists of computer-generated imagery.

Fumihiko Sori
Tokyo Broadcasting System, Inc.
5-3-6 Akasaka, Minato-ku,
Tokyo, 107-06
JAPAN
+81.3.5571.3969
naga@tbs.co.jp

Produced by: Seiichiro Kijima
CGI Director: Fumihiko Sori
CGI Animator: Tokushige
    Daiguuji, Kazuhiro Iwasaki
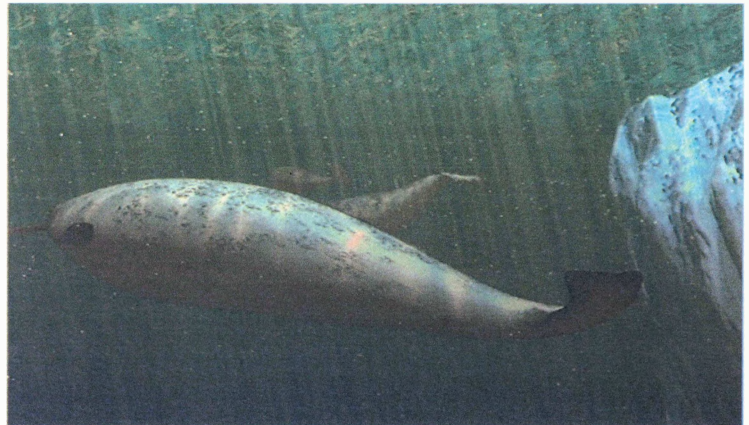
A family of elusive narwhals is viewed in their arctic habitat. Composited with film of walruses. Produced on SGI CE with Particle, Minerva, and Pandemonium for the transition. Rendered in HD.

Paul Scott
digital artworks
2295 Coburg Road, Suite 104
Eugene, Oregon 97401
USA
+1.503.344.6541
Artworks@efn.org

Produced by: digital artworks

For digital artworks: Paula
    Conn, Erik Johnson, Todd
    Kesterson, David Lang,
    Andy Larkin, Sunny Liau

For Midland Productions:
    Yas Takata, Larry Strothe

For Busch Entertainment Corp.:
    Eric Miles

SUPER D

SUPER D is a 3D cartoon about
an unsuccessful hero who
finally gets a job, and rescues
a woman from a dangerous
spider.

Ismail Acar
Student University Futwangen
von- Strauffenbergstrasse 9
72459 Albstadt
GERMANY
+49.40.2003969

Produced by: Ismail Acar
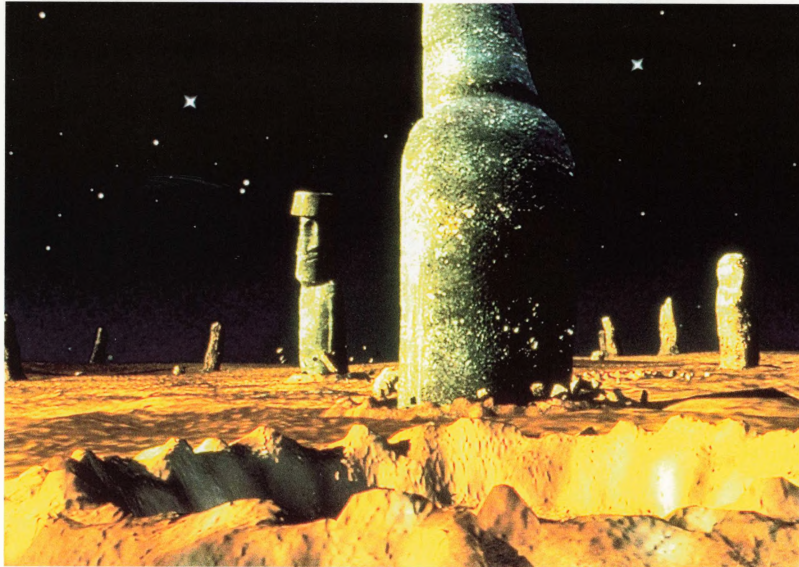
The Metamorph pierces the sandy surface of a planet, creating colossal sculptures. The Moai's face each other down in hand-to-hand battle, jumping like astronauts on the surface of the planet, leaving giant crevasses in the wake of their leaps. One of them will remain, the other will be expelled through a careless mistake. On the island, the Moai's are lined up, watching the sky, imagining what's going on. Suddenly, they see another Moai coming. It has been such a long time. They continue staring at the sky, expecting the scenario to start all over again...

Isabella Wadros
Relief
CHP CHANZY
8 rue du Centenaire
Montreuil 93100
FRANCE
+33.14857.9159

Produced by: Isabella Wadros
Director: Fredric Nagorny
R&D: Raymond Perrin
Music: David Moreau,
   J.L. Hennequin

A boy's parents have so organized his activities that he no longer has time for himself.

Claude Cloutier
National Film Board of Canada
Benoit Cote Marketing Officer
French Program Animation Studio
3155 Cote de Liesse
Montréal, Quebec H4N 2N4
CANADA
+1.514.253.9330

Produced by: Therese Descary
Computer-assisted colouring: Chantal Roy
Computer Graphics Advisor: Inex Hardtke
Computer graphics technical support: Marie-Nicole Tremblay
Digital imaging development and operations: Patrick Bergeron, Julie Dutrisac, Doris Kochanek, Richard Martin
Digital titles: Louis Overy, Val Teodori
Others: National Film Board Digital Imaging Services
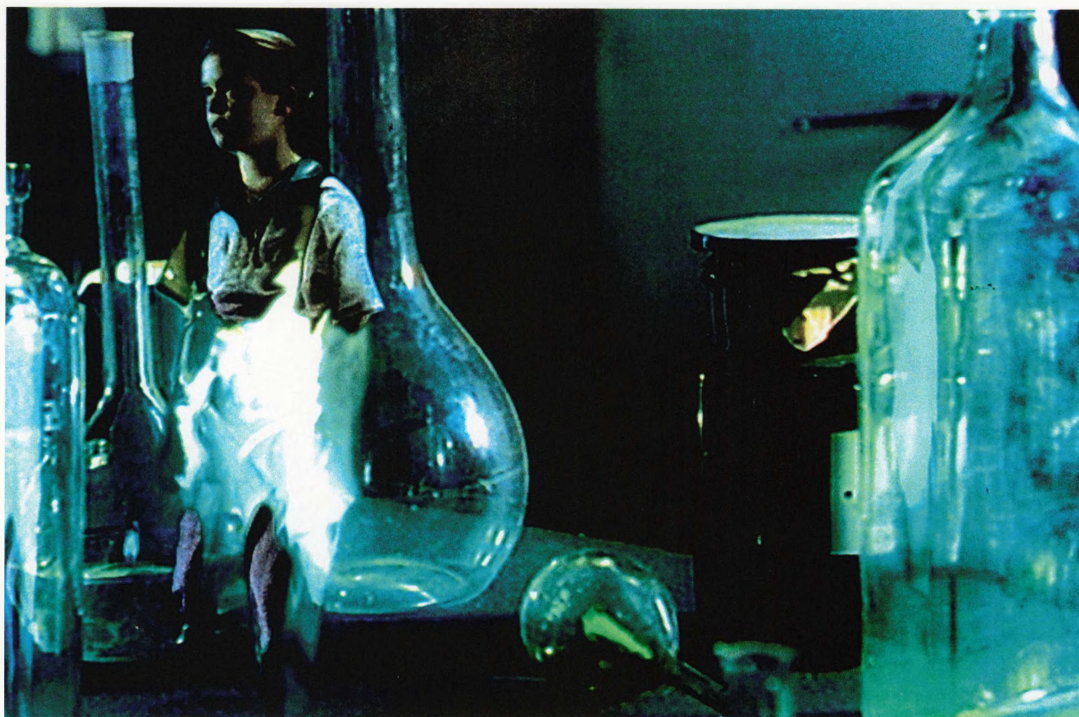
ALICE

Olga Mayatskiy
Steepler Graphics Group Ltd.
7224 Shoreline Drive #171
San Diego, California 92122
USA
+1.619.622.0317

Produced by: Natalia
    Efremova
Director: Gorshanov A
Idea: Gorshanov A
Animators: Klimemko D,
    Lachinov A, Lelebev Y,
    Parcshikov A SGI Indigo2
    Extreme, IndyXL, IBM PC
    Wavefront, Autodesk, Elastic
    Reality, Proprietary

CALIFORNIA
STATE
UNIVERSITY,
CHICO

This animation was created with Wavefront software. Produced by the Instructional Media Center at California State University, Chico. The animation is a flyby of the Chico Campus.

Rick Vertolli
California State University, Chico
First and Normal
Chico, California 95929-0005
USA
+1.916.898.4421
vertolli@ecst.csuchico.edu

Produced by: Rick Vertolli
Contributors: Chris Ficken,
    Randy Wall, Steve Worth

A SPIDER, THE
BOILER, AND A
LITTLE DYNAMITE

Opening with the sound of machinery and an ominous ticking clock, this piece takes you into a dark and deserted basement. Spiders aren't the only danger looming, as the source of the ticking is revealed in an explosive finale.

Paul Zinnes
University of Illinois at Urbana-Champaign
1846 Valley Road
Champaign, Illinois 61820
USA
+1.217.333.0952
pzines@ucsa.uiuc.edu

Animation: Paul Zinnes
Technical Producer:
    Erik Weeselak
Audio production: Camille
    Goudeseune
Video production: Tony Baylis

ROCKET

Produced as a demonstration piece, Rocket was designed to look as though it were a real event caught on film. Designed and implemented in Discreet Logic's Flame, elements from several sources were combined and enhanced or de-enhanced as required for the "look."

Milton Rodregues
Lamb & Company
650 Third Avenue South,
Seventeenth Floor
Minneapolis, Minnesota 55402
USA
+1.612.333.8666
milton@lamb.com

Produced by: Mark Youngrer
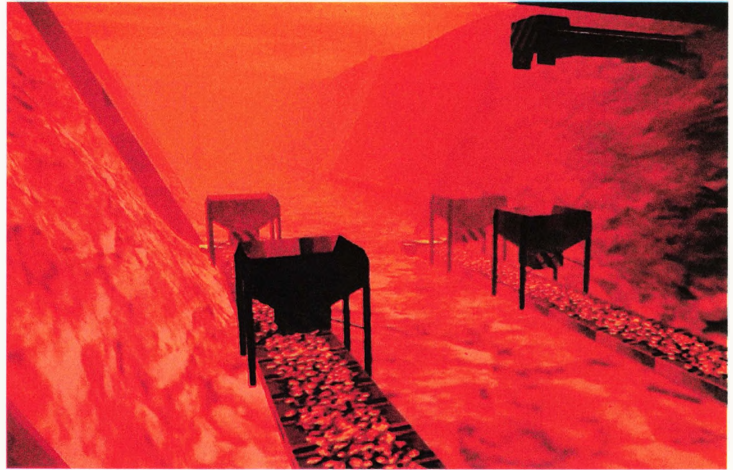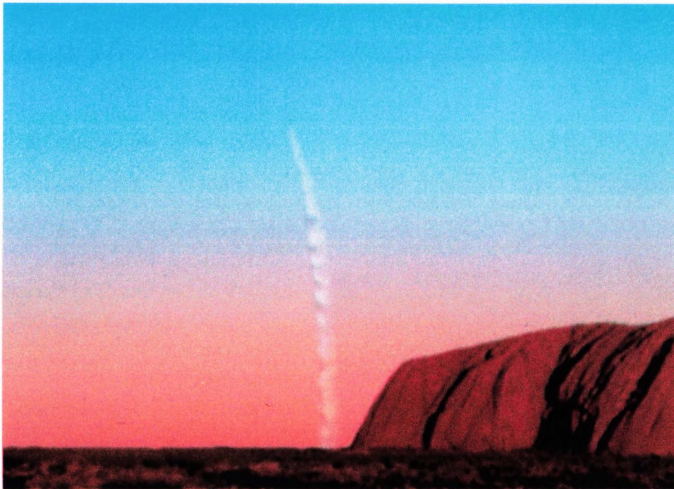
RED PLANET & BATTLETECH

The Virtual World real-time VR system features eight cockpits networked together into a common computer-generated environment. Each cockpit features an infinity optics system, fully lit and texture-mapped graphics, 3D audio system, and six auxiliary screens. The two adventures presented here are Battle Tech, a combat mission, and Red Planet, a race in the canals of Mars.

Jordan Weisman
Virtual World Entertainment
1100 West Cermak Road, Suite B404
Chicago, Illinois 60608
USA
+1.312.243.6515
jordan@virtualworld.com

Produced by: Virtual World Entertainment
Art: Dave McCoy, Lex Story, Duane Molitor, Tom Peters, Victor Bonilla
Programming: J.M. Albertson, Eric Huffman, Greg Corson, Chris Brewer, Ken Olsen, Jerry Edsell, Garth Hermanson, Gene Yakhnes, JoAnne Mason
Audio: Eric Huffman, Tom Effinger, Bing McCoy, Lonny Chu
Concept: Jordon Weisman
Director of Technology: Bill Redmann

LIBERATION

Music promo for the Pet Shop Boys: a 3D computer-animation extravaganza simulating a virtual reality experience.

Susanna Racke
601FX
34 Great Pulteney Street
London, WIR 3DE
UNITED KINGDOM
+44.71.439.2730
100542.2563@compuserve.com

Design: Ian Bird and John
   Wake, 601FX
Computer animation: Ian Bird
   and John Wake, 601FX
Director: Howard Greenhalgh,
   Why Not Films
Post production: Soho 601
Music: The Pet Shop Boys
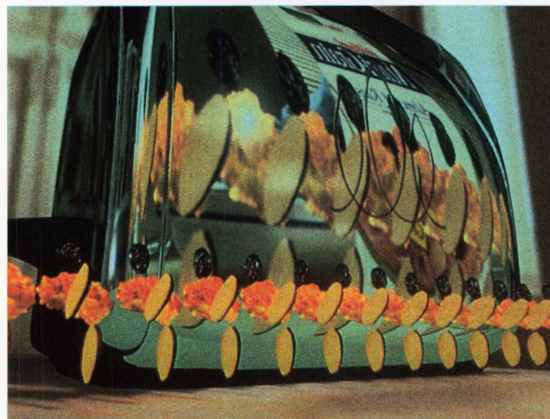
This Kellogg's Nutri-Grain spot features a live-action set and talent, along with animated Nutri-Grain characters made up of flakes, raisins, and almonds. The characters leap out of their box to inform and entertain a man having his breakfast.

Kori Rae
Pixar
1001 West Cutting Boulevard
Richmond, California 94804
USA
510.215.3420
kori@pixar.com

Pixar:
Animation/Art Director: Roger
   Gould
Technical Director: Oren Jacob
Executive Producer: Darla
   Anderson
Producer: Susan Hamana
Assistant Producer: Kori Rae
Technical Contributors:
   Don Schreiter, Keith Gordon,
   Mitch Prater, Mark
   VandeWettering, Tom Hahn,
   Peter Nye, Tony Apodaca
Animators: Roger Gould,
   Howard Baker, Bob Peterson
Output: Keith Gordon
Sound effects/music: Music by
Scott Chandler at
   Skywalker Sound
Video post: Western Images

J. Walter Thompson/NY:
Producer: Judi Nierman
Art Director: Frank Perry
Creative Director: Phil Halyard
Copywriter: Laurie Garnier
Account Executive:
   Allison Smith
Client Rep.: Steve Dunahoo,
   Production Manager
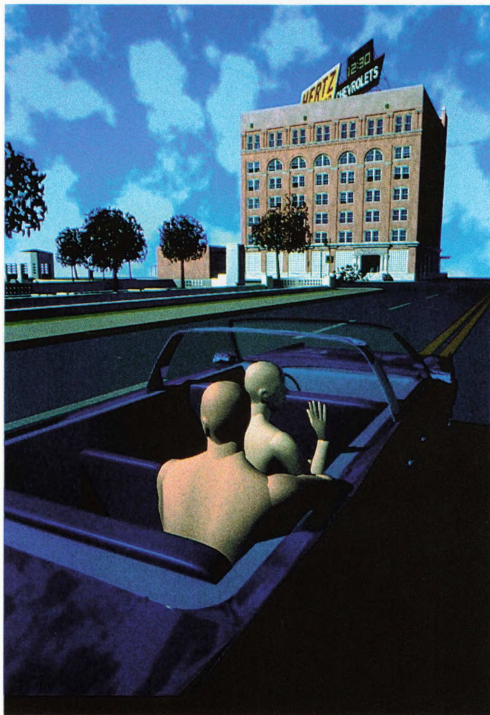
SECRETS OF A
HOMICIDE

Dale Myers
Microtech Graphics & Animation,
Inc.
9602 Hartel
Livonia, Michigan 48150
USA
+1.313.525.3203

Produced by: Dale K. Myers
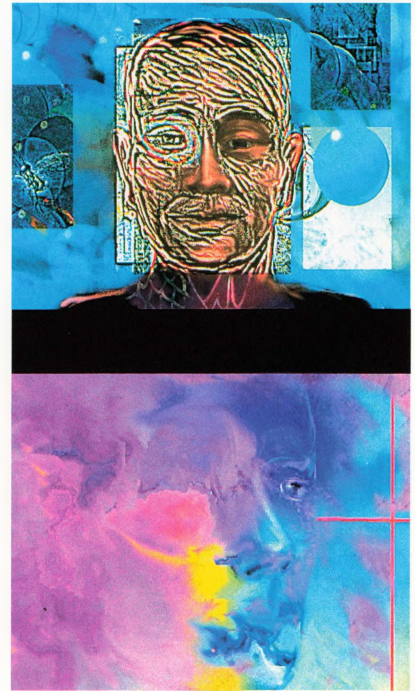
A THOUGHT HAS
NO PHYSICALITY

A Thought Has No Physicality
takes us on a mostly painted
animation journey. Matador,
Alias, and Morph were used
to create the journey. No
photographic images were
employed. We travel through
a mix of interior world and
nature, all culminating in the
stillness of a caught moment.
Then we cycle back to the
beginning.

Audri Phillips
Metrolight Studios, Inc.
5724 West 3rd Street, #400
Los Angeles, California 90036
USA
+1.213.932.0400
metro@netcom.com

Produced by: Audri Phillips
  and Metrolight Studios
Creative Director/Artist/
  Animator: Audri Phillips
Sound design: Ron Reynolds

George, a hard working bureaucrat, wakes from one of his many naps, plays with his face, and amuses himself with the SIGGRAPH *Conference Proceedings*. But people disturb his concentration, and he loses his temper. All the excitement makes him drowsy again. The advanced, physics-based facial modeling and animation techniques used to create this animation are described in the *SIGGRAPH 95 Conference Proceedings*.

Keith Waters
Digital Cambridge Research Lab
One Kendall Square, Building 700
Cambridge, Massachusetts 02139
USA
+1.617.692.7642
waters@crl.dec.com

Produced by: Keith Waters, Victor Lee, Demetri Terzopoulos, Mark Cadell

A montage of expressive computer graphics characters created by Pacific Data Images Character Animation Group.

John Robeck
Pacific Data Images
1111 Karlstad Drive
Sunnyvale, Califorinia 94089
USA
+1.408.745.6755
jr@pdi.com

Produced by: Pacific Data
    Images Character
    Animation Group

Internet

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Festival/Electronic Theater

Interactive
Entertainment

Interactive
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National and
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ACM SIGGRAPH   1515 Broadway, 17th Floor   New York, NY 10036 USA   +1.212.626.0500   +1.212.764.5537 fax