



# SIGGRAPH2005

L o s A n g e l e s

Millimeter and Video Systems present: | Special Issue

The Magazine for the 32<sup>nd</sup> International Conference on Computer Graphics and Interactive Techniques

Summer 2005 | Volume 3 Issue 1

Publication sponsored by

**Avid**  
computer graphics

**intel**

**hp**  
invent

**WACOM**

# Curious Labs AD



■ ON THE COVER

Art Director Tony de Moraes captures the diversity and festival-like atmosphere of SIGGRAPH 2005 using a collage of images drawn from various entries in this year's Computer Animation Festival and Art Gallery. The images used to create this multi-layered cover image came from the following works: *The Zit* by Mike Blum, *Venice Beach* by Jung-Ho Kim, *seri G B 1* by Floyd Gillis, *Drip* by Brian Knep, *2004.5* by Kenneth A. Huff, *Daughter's Rebirth* by AnnMarie LeBlanc and *My Life in Spam: One Week (November 1-30, 1998)* by Perry Hoberman.



16



27

■ FEATURES

- 16 A BLEND OF ART AND SCIENCE** *By Ellen Wolff*  
In soliciting clips to showcase in this year's Computer Animation Festival, the CAF SIGGRAPH committee made a conscious effort to reach beyond the Hollywood studio community to solicit works from students and the scientific world. The result is a festival that contains a rich blend of animations that range from the dramatic scenes of the latest *Star Wars* movie to the compelling visualizations of tornadoes and fluid dynamics simulations.
- 23 SEEDS OF EXCITEMENT** *By Audrey Doyle*  
As always, the Papers program serves as the heart of the SIGGRAPH conference, providing an ideal outlet for disseminating groundbreaking, provocative new work that ultimately serves as the seeds for future technology and product development. In this interview, SIGGRAPH 2005 Papers Chair, Markus Gross, provides a glimpse into some of the highlights of this year's Papers Program.
- 27 GEAR FOR GEARHEADS**  
SIGGRAPH's conference is accompanied by one of the most important trade exhibitions for the computer graphics hardware and software industry.

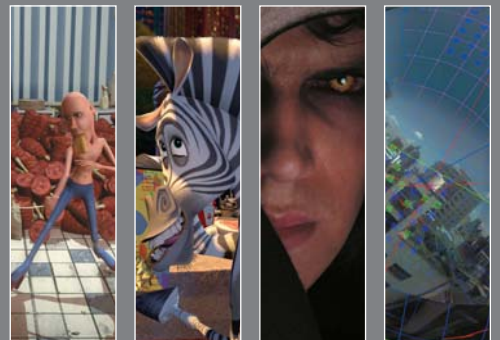


**SIGGRAPH2005**

[www.siggraph.org/s2005](http://www.siggraph.org/s2005)

■ DEPARTMENTS

- 04 FROM THE CHAIR**
- 10 POSTERS**
- 06 IN THE GALLERY**
- 10 WEB PROGRAM**
- 08 COURSES**
- 13 ETECH**
- 08 KEYNOTE**
- 15 PANELS**
- 10 SKETCHES**
- 15 SPECIAL SESSIONS**



millimeter | VIDEOSYSTEMS



23

## FROM THE CHAIR

When James L. Mohler attended his first SIGGRAPH in 1997, he was immediately struck by the unique quality of the conference. As a young professor with the Computer Graphics Department at Purdue University, he had attended other technical conferences. But nothing compared to SIGGRAPH.

“What really struck me about SIGGRAPH was the diversity of its attendees and the way those different groups interacted with one another,” says Mohler. “Even when you go to other interdisciplinary conferences, the different disciplines seem to tolerate one another, but they don’t really mesh. Here they really respect one another and feed off one another’s ideas, energies and creativity. The result is an atmosphere that is unique to this conference. It’s not something you can read about. It’s something you just have to experience.”

As Conference Chair for SIGGRAPH 2005, Mohler has been determined to make this year’s event as exciting and invigorating as any SIGGRAPH that has come before. To accomplish that, he and the rest of the SIGGRAPH 2005 Committee have added some exciting new features, such as a Full-Dome Animation Theater that’ll be located next to the registration area. Over by the Emerging Technologies area they’ll be making use of the Access Grid, a kind



of high-powered teleconferencing system, to deliver live performances by performers located around the world. And for the keynote address, they’ve landed none other than film legend and special effects pioneer George Lucas.

Finally, says Mohler, the SIGGRAPH Committee has made a special effort to strengthen the participation in SIGGRAPH by the scientific visualization community. “This is a community that has always been important to SIGGRAPH, but in recent years it’s prominence has diminished as special effects and video games have gained more attention. This year, we’ve worked hard to ensure that scientific visualization has a strong presence in all the venues, and I think that helps make the whole show more interesting and exciting.”

But as excited as Mohler is about SIGGRAPH 2005, he is quick to give credit to the venue chairpersons and others for pulling it all off. “For me, the biggest joy has been the opportunity to work with this fantastic group of people. This group has done a masterful job of really merging as a team and creating complementary content across the various programs. It’s because of their efforts, and the efforts of the hundreds of other volunteers who contribute their time to the show that we’ve been able to put together a conference that I think is really going to be something to remember.”

Whether you come for the courses, the exhibits, the animations, or the technology demonstrations, SIGGRAPH 2005 is sure to delight. Welcome to Los Angeles! Enjoy the conference and exhibition!

## SIGGRAPH 2005 COMMITTEE

SIGGRAPH 2005 was made possible by the dedication of the following individuals and others who invested their time, expertise, intellectual curiosity, and enduring faith in CG.

**SIGGRAPH 2005 Conference Chair**  
James L. Mohler, *Purdue University*

**ACM SIGGRAPH  
Conference Chief Staff Executive**  
Dino Schweitzer, *Capstone Solutions Inc.*

**SIGGRAPH 2005 Conference Manager**  
Ramon Ford, *Capstone Solutions Inc.*

**Art Gallery**  
Linda Lauro-Lazin, *Pratt Institute*

**Computer Animation Festival**  
Samuel Lord Black, *Penguin Flight Dynamics*

**Courses**  
John M. Fujii, *Hewlett-Packard Company*

**Educators Program**  
Patricia Beckmann-Wells, *Bunsella Films*

**Emerging Technologies**  
Donna J. Cox, *NCSA/University of Illinois at Urbana-Champaign*

**GraphicsNet**  
Joseph M. Cychosz, *Purdue University*

**Guerilla Studio**  
Peter Braccio, *Monterey Bay Aquarium Research Institute*

**International Resources**  
Rejane Spitz, *Pontificia Universidade Católica do Rio de Janeiro*

**Panels and Special Sessions**  
Jill Smolin, *The Gnomon Workshop*

**Papers**  
Markus Gross, *Swiss Federal Institute of Technology (ETH) in Zürich*

**Sketches and Posters**  
Juan Buhler

**Web Program**  
Nishant Bharat Kothary, *Amazon.com*

**Student Volunteers**  
Ronald J. Glotzbach, *Purdue University*

**Publications**  
Stephen N. Spencer, *The University of Washington*

Intel  
AD

## IN THE GALLERY

Chair: Linda Lauro-Lazin, Pratt Institute

The name of this year's Art Gallery, Threading Time, reflects a focus on artwork that traces threads in time and space. Unlike past years, artwork will be organized by content, rather than media, in an effort to encourage viewers to become more engaged with the meaning of the art. In addition, the Art Gallery will show more artwork by fewer artists in order to provide a deeper window into each artist's work. In addition to the 110 exhibits, 11 art animations will be shown in the Art Gallery screening room.



### External Measures Untitled V by Camille Utterback

This interactive art installation creates imagery that is painterly, organic, and evocative while also remaining completely algorithmic. While the specific rules of the system are never explicitly revealed to participants, the internal structure and composition of the piece can be discovered through a process of kinesthetic exploration. Engaging with this work creates a visceral sense of unfolding or revelation, as well as a feeling of immediacy and loss. The effect is at once sensual and contemplative.

### Oral Fixations by Jessica Hodgins et al

This single-channel video installation evolves over a seven-hour time period. The project is a darkly humorous look at a habit of endless consumption and the resulting accumulation of waste. A narrative gradually emerges from the on-screen action. An interdisciplinary team of artists, actors, and computer scientists produced this project.

### Watchful Portrait (Caroline) by John Gerrard

This work presents two virtual portraits that track the position of the sun and the moon at all times. This is achieved by inputting the precise scientific information as to the movement of these elements and designing the portraits so they follow these coordinates with their eyes and head at all times. The portrait on the left tracks the sun, while the one on the right tracks the moon. If either element is not visible, Caroline closes her eyes and sleeps.

### Arrival by Paul Kaiser and Shelley Eshkar

In this multimedia installation, viewers peer down onto small figures moving through the ambiguous spaces of office, mall, apartment and video game. The piece presents viewers with not only a spatial, but also a temporal puzzle. A portion of the figures moves forward in time, the others move in reverse; and since the piece loops perfectly, it has no beginning or end.

## ART GALLERY SPECIAL FEATURES

In addition to the exhibits, the Art Gallery will offer these special features:

**Art Papers:** Six in-depth presentations on a variety of topics ranging from "Memory Rich Garments" to "Beings Paintings"

**Art Panels:** Three panels offer attendees a chance to hear and share opinions on cutting-edge topics

**Storyboards:** A display of storyboards from such Electronic Theater animations as *Star Wars Episode III: Revenge of the Sith* and *Fallen Art*

**Access Grid:** Performers located around the world use the Access Grid to join together in three, real-time, distributed performances



Intel  
AD

## COURSES

Chair: John M. Fujii, Hewlett-Packard Company

The 39 offerings in this year's Courses program span a wide range of topics from visualization to animation to rendering. Offered in full-day, half-day, and short tutorial formats, the courses present attendees with a chance to explore the ideas, technologies and developments that exist on the bleeding edge of the industry. They not only teach, they inspire. Taken together, says Courses chair John Fujii, they "are your future's DNA."

- Debra Miller of **The Art Institute of California** offers valuable advice to those just starting out in computer graphics in her session "Anyone Can Make Quality Animated Films! (The Eight Basic Steps to Success)": *Sun., July 31, 8:30 a.m. – 12:15 p.m.*
- Sunil Hadap of **PDI/Dreamworks** and Vangelis Kokkevis of **Sony Computer Entertainment** pull examples from film and video games in their session "Introduction to Articulated Rigid Body Dynamics": *Sun., July 31, 8:30 a.m. – 12:15 p.m.*
- Philippe Gluckman and Denise Minter head a team of presenters from **DreamWorks Animation** in the session "*Madagascar*: Bringing a New Visual Style to the Screen": *Sun., July 31, 1:45 – 5:30 p.m.*
- Existing techniques and remaining challenges are the topics for discussion in the session entitled "Digital Face Cloning." Among those speakers are David Bennett of **Sony Pictures ImageWorks**, George Borshukov of **Electronic Arts**, Christophe Hery and Steve Sullivan of **Industrial Light + Magic**, and Lance Williams of **Applied Minds**. *Sun., July 31, 8:30 a.m. – 5:30 p.m.*
- Daniel Thalmann of **EPFL VRlab** and Laurent Kermel and William Opdyke of **PDI/DreamWorks** are among the speakers who'll present state-of-the-art techniques used to generate animated crowds in such films as *Shrek2*, *Lord of the Rings*, and *Madagascar* in the session "Crowd and Group Animation": *Mon., Aug. 1, 8:30 a.m. – 12:15 p.m.*
- Tim McLaughlin of **Industrial Light + Magic** will discuss the process of creating digital creatures in the session "Taxonomy of Digital Creatures: Interpreting Character Designs as Computer Graphics Techniques": *Mon., Aug. 1, 3:45 – 5:30 p.m.*
- Rob Bredow will lead a team of presenters from **Sony Pictures Imageworks** in a discussion of innovative motion capture techniques in the session "From Mocap to Movie: The Making of *The Polar Express*": *Tues., Aug. 2, 8:30 a.m. – 12:15 p.m.*
- Ewan Johnson and Denise Minter of **DreamWorks Animation** will pull examples from *Madagascar* in their examination of the role of staging and composition in computer-animated films in the session "The Invisible Actor" *Tues., Aug. 2, 1:45 – 5:30 p.m.*
- Peter Shirley of the **University of Utah** and Philipp Slusallek of the **Universität des Saarlandes** lead a team of speakers in the session "Introduction to Real-Time Ray Tracing." The course gives attendees the background and insight required to build their own fast ray tracers while also discussing advanced applications. *Wed., Aug. 3, 8:30 a.m. – 5:30 p.m.*



Madagascar Image Courtesy DreamWorks Animation

For more info on Courses, go to [www.siggraph.org/s2005](http://www.siggraph.org/s2005)

## GEORGE LUCAS



## SIGGRAPH 2005 KEYNOTE ADDRESS

A Keynote Q&A with the Father of Digital Cinema

Monday, August 1,  
1:15 – 3:15 p.m.

While the keynote address is always one of the highlights of SIGGRAPH, this year's keynote has to be considered an extra special event, given that it will be delivered by one of the most innovative, successful and visionary film directors of all time—George Lucas.

"Lucas' remarkable storytelling and cinematic technical achievements have awed and inspired the computer graphics community for more than 30 years," says James L. Mohler, SIGGRAPH 2005 Conference Chair. "His insights promise to intrigue and engage conference attendees across all industries and interests. It is quite fitting that one of the foremost storytellers and technological innovators of our time speaks at the conference for innovators not only in film but also in art, science, and technology."

Lucas is most widely known as the creator, writer and director of the *Star Wars* movies, the last installment of which was released this year. *Star Wars: Episode III Revenge of the Sith* marks the end of a saga that, when it was first launched in 1977, became an international phenomenon and helped change the movie industry forever by ushering in a new era of computer-generated special effects.

In addition to the *Star Wars* movies, Lucas also directed or produced such other film classics as *American Graffiti*, *Willow*, *Tucker: The Man and His Dream*, and the *Indiana Jones* series of films.

Over the years, Lucas has played a key role in advancing the state-of-the-art of both computer graphics technology and high-definition digital production technologies. In addition to founding Industrial Light + Magic, Lucas is also chairman of Lucasfilm Ltd., a fully integrated entertainment company that, in addition to its motion-picture production activities, includes ILM, LucasArts, and Lucas Licensing and Skywalker Sound.

Intel  
AD

## WEB PROGRAM

Chair: Nishant Bharat Kothary, [Amazon.com](http://Amazon.com)

As the Web Program enters its fourth year at SIGGRAPH, it's undergoing a bit of a make-over. The change, says Web Program Chairperson, Nishant Kothary, was prompted by a desire to reach out to the academic community.

This year's program has been divided into three separate tracks—Application, Paradigm, and Technical. The Application Track showcases short presentations about cutting-edge applications on the Web. The Paradigm Track showcases presentations about cutting-edge advances in such areas as Web standards, usability, user experience, and design. The Technical Track consists of the presentation of peer-reviewed papers. The review process for this track was roughly modeled after the review process for SIGGRAPH's Papers program.

In total, the Web Program program will consist of 19 presentations—four Technical Track presentations, five Paradigm Track presentations, and nine Application Track presentations. There will also be one panel discussion. The speakers in this year's program will include:

**Ze Frank**—Online performance artist and humorist, Ze Frank is best known for his hilarious video *How To Dance Properly*. Ze's talk, titled *The Creative Act*, will delve into the importance of the creative process as it applies to the web. [www.zefrank.com](http://www.zefrank.com)

**Peter Morville**—A world-renowned information architecture guru, Peter will be speaking about user experience design. [www.semanticstudios.com](http://www.semanticstudios.com)

**Casey Reas**—The co-creator of the fantastic java-based graphical programming language, Processing, Casey will be speaking about the same. [www.processing.org](http://www.processing.org)

**Ed Burton**—Research and Development Director at Soda Creative Ltd., a British design group formed in 1996, which combines art and research with a broad range of commercial activities. Ed will speak about his latest innovation, Moovl. [www.moovl.com](http://www.moovl.com)

For a full list of sessions, go to [www.siggraph.org/s2005](http://www.siggraph.org/s2005) and click on the Web Program link.

## POSTERS

Chair: Juan Buhler

After a successful introduction last year, the Posters program is once again returning to SIGGRAPH. The Posters program is a presentation forum modeled after those used in scientific research conferences.

With a focus on research projects, the Posters format calls for participants to mount physical posters that summarize their work on a wall. The Posters are displayed throughout the conference week, allowing conference attendees to browse through them to quickly get an idea of some of the newest or lesser known projects underway in the research world. If something of particular interest catches their eye, they can return to the poster area to chat with the poster's author during the one or more scheduled meeting times allotted to each author.

The value of the Posters program is that it provides a useful, alternative forum to the SIGGRAPH Papers program for communicating important research information. Newly developing projects, smaller works, incremental or partial results, and late-breaking research are all good candidates for Posters even though they might not qualify for a formal paper or be able to meet the early submission deadlines required of papers.

In addition, because the Posters format can accommodate hundreds of posters if necessary, the program is able to be a more inclusive venue, expanding the number of people able to participate in the computer graphics and interactive techniques research community.

## SKETCHES

Chair: Juan Buhler

This year's Sketches program consists of 149 talks—or sketches—that have been grouped into 37 sessions by topic. Each sketch consists of a 20-minute presentation followed by a five-minute Q&A session. Open to virtually any topic in computer graphics, Sketches provides an ideal forum for quickly sharing information on everything from behind-the-scenes information on commercial and artistic works to new developments in research.

Sketches presentations are different from the presentations in the Papers program in that the presentations are informal. Many times they focus on a work in progress that is not yet ready to be published as a formal paper. However, this year, for the first time, paper authors have been invited to submit "Implementation Sketches."

The concept of Implementation Sketches is being introduced because the constraints of the Papers venue often require that paper authors must leave important implementation details out of their presentations in favor of thoroughness in the science presented. The Implementation Sketches attempt to provide a solution to that problem by providing paper authors with a forum where they can discuss the practical details of their ideas.

For a full list of Sketches, go to [www.siggraph.org/s2005](http://www.siggraph.org/s2005)

Intel  
AD

# Expressions AD



## EMERGING TECHNOLOGIES

Chair: Donna J. Cox, NCSA/University of Illinois at Urbana-Champaign

This year's Emerging Technologies venue will feature 34 exhibits, which is just over one-quarter of the total number of proposals submitted to this year's jury. For this year's show, the ETECH committee actively sought works that blurred the boundaries between art and science. Many of the exhibits represent adventurous innovations that will help define 21st-century technology. The committee showed particular favor to those proposals that explored science, high-resolution digital cinema technologies, and interactive art-science narratives.

### The Interactive Fog Screen

**Ismo Rakkolainen, University of California, Santa Barbara**

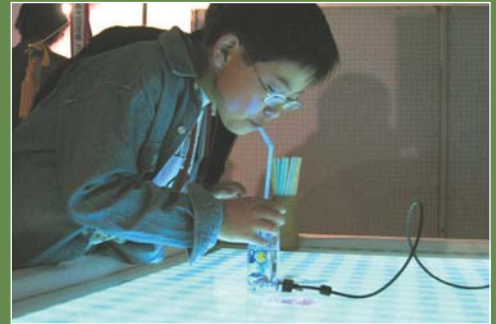
The popular walkthrough fogscreen shown at SIGGRAPH 2003 has been enhanced with the addition of interactivity. This represents a major technical improvement with important implications for a variety of applications, ranging from entertainment to advertising to training. The screen can be combined with various tracking technologies, such as unobtrusive finger tracking, which will be demonstrated at this year's show. Also, actor Markku Laitinen will present short, entertaining performances that illustrate some of the medium's artistic possibilities.



### Straw-Like User Interface

**Yuki Hashimoto, The University of Electro-Communications**

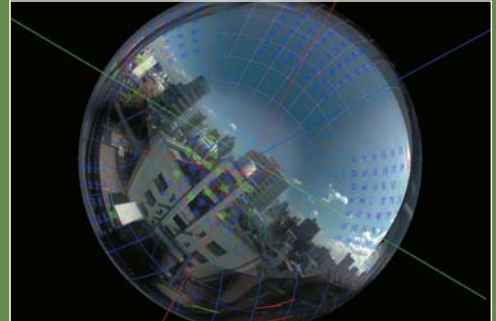
This evolutionary interface system allows users to virtually experience the sensations of drinking. The sensations are created by referencing sample data of actual pressures, vibrations, and sounds produced by drinking from an ordinary straw attached to the system. Eventually the interface will be extended to provide wider varieties of information to the mouth and lips. The technology holds the promise of providing distance communication via touch and augmenting sense perception among the elderly and physically challenged.



### MotionSPHERE

**Hiroki Mori, ViewPLUS**

This demonstration highlights an image-processing technology that stabilizes the trembling in images that are captured by a rotating camera in real-time while also providing the ability to track objects no matter how fast they are moving. Currently stabilization and object tracking work fine separately, but not together. The goal of this project is to combine them in real time, interactively. Eventually this technology could lead to the development of cameras that can be embedded in unique places such as a spinning basketball, providing a clear, steady image from the ball's point of view.



## ACCESS GRID DEMONSTRATIONS

The Access Grid is an emerging, scalable teleconferencing technology currently being used in the scientific, research and academic communities for worldwide, interactive events. Its ability to support high-quality audio and video makes for a compelling, real-time user experience.

To demonstrate the power of this collaborative communications medium, the Emerging Technologies and Art Gallery committees have worked together to set up a schedule of panels, presentations, and artistic performances that will be delivered via the Access Grid by participants located around the world. The events will be displayed on three large screens in a dedicated Access Grid area at the following dates and times.

### Monday, Aug. 1

9–11 a.m. Panel: Consciousness and Connectivity  
4–4:30 p.m. Live Performance  
4:30–5 p.m. Live Performance

### Tuesday, Aug. 2

9–11 a.m. Panel 2: Extensions of Embodiment  
1–1:45 p.m. Presentation: Telematic Mind in the Domain of Moistmedia  
4–4:30 p.m. Live Performance  
4:30–5 p.m. Live Performance

### Wednesday, Aug. 3

4–4:30 p.m. Live Performance  
4:30–5 p.m. Live Performance

### Thursday, Aug. 4

4–4:30 p.m. Live Performance  
4:30–5 p.m. Live Performance

# Cloud 19 AD



## PANELS

Chair: Jill Smolin, The Gnomon Workshop

Here's your opportunity to agree, disagree or simply listen to outspoken advocates on every side of controversies that affect our digital future. Panelists discuss, confer with, and debate each other in a free-flowing format that generates consensus, controversy, confusion, and clarity--sometimes simultaneously. Seating is on a first-come, first-served basis, so be sure to arrive early!

### The Open-Source Movement and the Graphics Community: Can OpenSource, Third Party, and Proprietary Software Models Coexist?

Tuesday, Aug. 2, 1:45 - 3:30 pm

In recent years, the open-source movement has increased dramatically. Harnessing the power of thousands of developers and testers has proven successful, to varying degrees, in developing operating systems, graphics applications, and web tools, including Linux, POV-Ray, Blender, Gimp, and Apache. In this session, developers of open-source software, in-house proprietary software, and commercial software, and practitioners



The Polar Express Image Courtesy Sony Pictures Imageworks

who encounter all kinds of software discuss whether the open-source model is relevant and useful to the graphics community. Does the model of proprietary application research, development, and usage serve the industry better? Or will commercial facilities continue to primarily choose off-the-shelf solutions? *Moderator—Gil Irizarry, Conoa, Inc.*

### Believable Characters: Are AI-Driven Characters Possible, and Where Will They Take Us?

Wednesday, Aug. 3, 10:30 am - 12:15 pm

Where are we (and our characters) going with artificial intelligence? How is interactive entertainment changing in games for Playstation3, Xbox2, and massive multiplayer, online role-playing environments? How does AI affect development of emotionally believable characters? What are the subliminal tip-offs that spoil the illusion of credible characters? Industry experts, artists, character animators, and programmers share their insights and help us answer some fundamental questions. *Moderator—Stephen Gray, Electronic Arts*

### From University Lab to Movie Screen and Back Again: How Does Research Change Production Tools, and How Do Production Needs Influence Academic Research?

Wednesday, Aug. 3, 3:45 - 5:30 pm

How and when do academic research ideas make their way into feature animation and visual effects production facilities? What kinds of graphics research ideas have made good production tools, and how are they transformed by practical experience and needs? What pressing production issues should be considered in academic circles? How could academia and industry work together more closely to bridge the gaps? Panelists from academia and production explore these and other issues in this vital relationship. *Moderator—Daniel Goldman, University of Washington*

### The Ultimate Display: What Will It Be?

Thursday, Aug. 4, 8:30 - 10:15 am

This panel examines future trends in display technology, ranging from stereoscopic and autostereoscopic techniques, holography, and 3DTV to projector-based concepts. Leading experts from science and industry discuss possibilities, developments, and limitations of tomorrow's displays; fundamental facts; and emerging trends and applications. *Moderator—Oliver Bimber, Bauhaus-Universität Weimar*

For more info on Panels, go to [www.siggraph.org/s2005](http://www.siggraph.org/s2005)



## SIGGRAPH2005

### SPECIAL SESSIONS

Chair: Jill Smolin, The Gnomon Workshop

This year's slate of Special Sessions offers a glimpse into the past, present, and future of digital technologies. Industry experts offer enlightening insights into the art, science, trends, and breakthrough concepts of the current and future state of computer graphics and interactive techniques.

**Jump! Shout! Dance! Sing!** An Interactive Conversation about Games, Game Art, and Play that Goes Way Beyond the Joystick  
Monday, Aug. 1, 6:00—8:00 pm

**From the Earth to Infinity:** Scientists from Caltech's Jet Propulsion Laboratory Reveal Secrets of the Universe Through Remarkable Images of Mars, Saturn, Earth, and the Deepest Reaches of Space  
Tuesday, Aug. 2, 3:45—5:45 pm

**A Star Wars Retrospective from Industrial Light + Magic:** Environments, Space Battles, and the Characters Who Fought Them From 1977 to 2005  
Tuesday, Aug. 2, 6:00—8:00 pm

**The Legacy of Disney Animation:** A Journey to the Past, Present and Future Through the Eyes of Disney Animators, Directors, Designers, and Storytellers  
Wednesday, Aug. 3, 10:30 am—12:30 pm

**Extreme Fashion:** Designers, Artists, and Technologists Present a Glimpse into the Place Where High Fashion Collides with High Technology  
Wednesday, Aug. 3, 5:30—7:30 pm

**The Polar Express:** Artists and Technicians Reveal How They Transformed a 3D Train Ride into a 3D Stereoscopic Adventure  
Thursday, Aug. 4, 11:30 am—1:15 pm



*TOP: A highlight reel that will be shown at the Electronic Theater will focus on how George Lucas takes realism to the next level in Star Wars Episode 3: Revenge of the Sith. (Image courtesy of LucasFilms ©2005)*

*BOTTOM: The unique visual style of Madagascar (bottom) will not only be on display in the Electronic Theater, but will be a topic of discussion of one of the sessions in the Courses program. (Image courtesy of DreamWorks Animation ©2005)*



# A Blend of Art and Science

## The SIGGRAPH 2005 Computer Animation Festival

by Ellen Wolff



*TOP: Tippett Studios turned Los Angeles into a hellish landscape (top) for the Keanu Reeves movie Constantine. (Image courtesy of Tippett Studios)*

*BOTTOM: Curious Pictures relied on its compositing and special effects skills to create this scene of a man flying down the highway in an office chair. The scene comes from the commercial Life in the Fast Lane, which will be shown in the Computer Animation Festival screening rooms. (Image courtesy Curious Pictures)*

When a crowd of 25,000 converges in Los Angeles for SIGGRAPH 2005, the hot ticket they'll be seeking is for the two-hour "Best of Show" Electronic Theater. This portion of SIGGRAPH's Computer Animation Festival features 26 pieces chosen for both technical excellence and creative innovation. Considering that these 26 winners were culled from 560 submissions, landing a place in "ET" is as good as it gets.

An additional 42 pieces comprise the Animation Theater, a series of screenings that run continuously throughout SIGGRAPH. But this year's Computer Animation Festival Chair, Samuel Lord Black, cautions against regarding those pieces as second tier. "The mix of the show was actually an important key for us. We changed the way the jury has worked in the last couple of years. Instead of just ranking pieces by the number of votes received, we wanted to craft a good show out of what we picked. So we have some really good pieces in the Animation Theater that didn't quite fit the ET."

Black, a CG software expert whose production credits include *The Incredibles*, *Finding Nemo*, *Monsters Inc.* and *Toy Story 2*, chose his seven-person jury with an eye towards diversity.

"I wanted jurors from outside the U.S. and from different factions of the CG industry," he says.

As a result, the primary panel included David Ebert from Purdue University, Donna Cox from the National Center for Supercomputing Applications, Emru Townsend from *fps Magazine*, Linda Lauro-Lazin from Pratt Institute, Pierre Hénon from Ecole Nationale Supérieure des Arts Décoratifs, Shuzo John Shiota from Polygon Pictures and Ted Burge from Walt Disney Feature Animation. The winning pieces that this jury chose reflected the state of CG art—and science—in 14 countries. These winners were also noteworthy for reviving attention to SIGGRAPH's



## Best of Show: 9

*Written, Directed and Animated by Shane Acker*

Like all great films, Shane Acker's *9* defies easy description. As *9* has traveled the worldwide film festival circuit, it's been described as a post-apocalyptic fantasy and an urban fairytale. It chronicles the triumphs of a rag-doll character named *9* who outwits a giant mechanical beast that's bent on stealing *9*'s soul. Set in a junkyard world where only the best scavengers survive, *9* features characters cobbled together from screws, nuts, zippers and bolts. Yet without a word of dialogue, this 10-minute film manages to convey layers of poignant emotions.

Acker credits artists like Jan Svankmeyer, The Brothers Quay, The Lauenstein Brothers and Zdzislaw Beksiniski as sources of inspiration for *9*. Conceived as a graduate project for Acker's UCLA Master's degree in film, *9* took four years to complete. "I was shooting to make it a festival piece, sort of as a calling card for me as a director. That's why I took a lot of time crafting it."

It proceeded in stages, Acker recalls. "I spent about two years working on *9* at school and then I went on a leave of absence and started doing freelance jobs. I would take a gig for a few months, save my money, and then get back to *9*." One of Acker's freelance gigs was nothing less than animating at WETA Digital on *The Lord Of The Rings: The Return Of The King*, which he cheerfully calls "animation boot camp."

A small group of friends helped Acker periodically with *9*, and he did get encouragement from Rhythm & Hues, which in 2001 awarded him a Computer Graphics Scholarship in Modeling based on tests for his film. But for a great deal of the time *9* was a solitary effort, with Acker handling animation, lighting and shading for the film. The detailed textures, the play of shadow and light and the camera angles and cutting reveal the skills of a gifted filmmaker hitting his stride.

"Technology has now trickled down so that you don't need a huge crew," he observes. "But you definitely need a lot of time. Twenty years ago I couldn't have made *9*. The technology wasn't there to do it all in one workstation."





scientific past, and for recognizing the student talent that will drive the medium's future.

### The Pros:

#### Virtual Vaders and CG Chewbaccas

Of course the chosen few included an ample dose of high-end Hollywood, which has been heavily featured at SIGGRAPH ever since CG features and digital effects became entertainment industry staples. Certainly there are the expected winners, including ILM, Dreamworks Animation, Digital Domain, Disney and Tippett Studios. In addition to ILM's 2005 highlight reel, the studio is represented by a piece devoted to *Star Wars Episode 3: Revenge of the Sith*, which Black says, "Takes everything up to the next level of realism."

PDI/DreamWorks also delivered a winning technical piece, *Making of Madagascar*, which reveals the processes behind the CG feature.

*In a four-minute short entitled In the Rough created by Blur Studio, caveman Brog discovers the hard way that the bachelor life isn't all it's cracked up to be. (Image courtesy of Blur Studio)*

Acker estimates that the hard costs for 9 were around \$5,000. Rhythm and Hues donated the time and facilities to film out to 35mm, and 740 Sound Design and Danetracks donated facilities for the sound. "I couldn't have done it without them," he says.

Having now won SIGGRAPH's Best of Show honors, 9 qualifies for Oscar consideration. But Acker has dreams beyond competing for a Best Animated Short Film statuette next spring. "I've paired up with some producers and we're developing 9 as a feature. I wrote a treatment and I've got people interested in it. This would be an independent production. We're really concerned about allowing 9 to be what it wants to be, and not have to tweak it too much. So we're trying to do it for not a whole lot of money and outside the studio system so that I can be protected and make the movie that I want to make. I think my timing couldn't be better. There's so much going on in animation industry right now, and so much interest."

Acker's exposure at SIGGRAPH will certainly help generate buzz among the film industry's digital cognoscenti. In addition to the screenings of 9 in the Electronic Theater, Acker will conduct an hour-

long "Meet the Filmmaker" session during SIGGRAPH. "I'm going to show the animatic," he explains. "It's the skeleton that allowed me to have such a long production time and to stay on track. When you play the animatic alongside the finished film, it's basically the same movie—it's just in pencil, in black and white."

Looking back on the long road to this success, Acker admits, "It did seem like I was pushing this boulder up a hill by myself for a long time. When I was in the middle of the production—say year 3—I hated it. But once it's done and out there in screenings, you only remember snippets of misery. You just look back on the production with fondness and say 'That was the best time of my life.'"



As Black observes, “In addition to the animation, you can see how everything was built—the hair, the fur and all the sand and fire effects.” But since the timing of this year’s show wasn’t right for the next feature releases from Pixar, Sony Pictures Imageworks, Blue Sky or Rhythm & Hues, Black says “There were actually very few feature film submissions.”

Yet the venerable tradition of studios creating short films was continued with not one but two ET winners from Blur Studio—*In the Rough* and the Oscar nominee *Gopher Broke*. That might be a record, especially for a relatively small shop like Blur. And SIGGRAPH history definitely was made by Tomek Baginski of Poland’s Platige Image. His film *Fallen Art* was awarded Jury Honors this year, making Baginski the first two-time winner at the SIGGRAPH Computer

*Final Fantasy XII* from Square Enix made the cut. And unlike the past two SIGGRAPHS, there are no real-time rendered pieces among the winners this year.

### Sci-Viz: The Genii Return

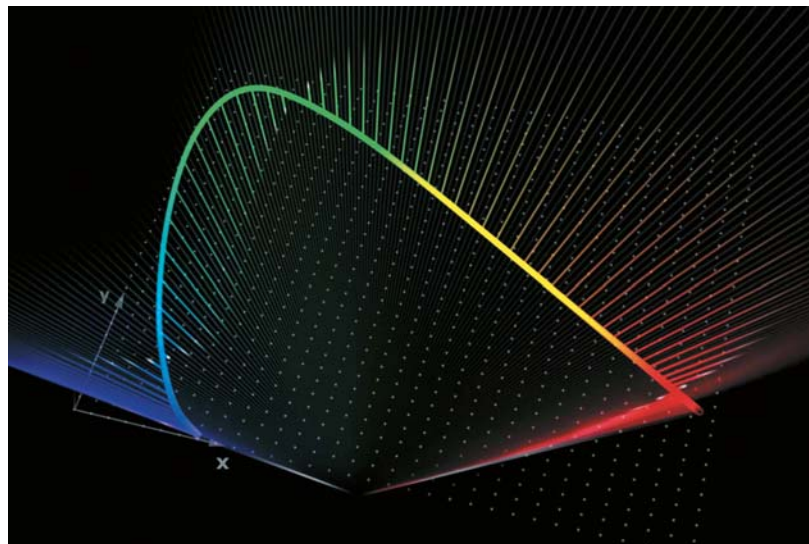
Behind the cool effects audiences see onscreen are usually lineages of scientific visualization research—from the subsurface scattering techniques that give CG characters plausible looking skin, to the fluid dynamic simulations behind faux floods. The first visual demonstrations of these techniques—usually done by scientists—largely have been overlooked in the years since SIGGRAPH has “gone Hollywood.”

Certainly most of these visualizations lack the glossy production values of entertainment animation. But things are different this year, thanks to a conscious outreach effort to the sci-viz community. “Bring your brain” was a theme of SIGGRAPH’s Call for Participation this year, and Black wanted to make sure that call was heard. “The visualization community was somewhat disaffected with SIGGRAPH,

*Right: The video Visualizing the XYZ Color Space is just one of several sci-vis entries in this year’s Electronic Theater. (Image courtesy Sony Pictures Imageworks ©2005)*

*Opposite Page Top: Among the many student films that will be shown at the ET is La Migration Bigoudenn, which won Jury Honors. (Image courtesy of Gobelins, l’École de l’image ©2004)*

*Opposite Page Bottom: Tomek Baginski of Poland won Jury Honors for the second time in three years with his video, Fallen Art. (Image courtesy Platige Image ©2004)*



Animation Festival. Tomek previously won Best Animated Short honors at SIGGRAPH 2002 for *The Cathedral*.

CG artists who typically work in television also were also well represented among the festival winners, including American director David Fincher, who submitted an ingenious photo-real CG for an HP commercial done at Digital Domain.

But Black notes, “A lot of the broadcast and commercial work that was submitted was from overseas.” Pro pieces were submitted from France, Japan, Germany, Australia, Canada, Switzerland and the Netherlands, but two British shops stood out—Framestore CFC and Passion Pictures each had two winning entries.

Probably the biggest surprise among the professional submissions came in the category of game animation. Only two game cinematics, Blizzard Entertainment’s *World of Warcraft* and

seeing how things were moving away from it. We wanted to say ‘Come back. We’d like to see your stuff.’”

CAF Chair Black put juror Dr. David Ebert in charge of the outreach effort, and Ebert recalls, “A lot of people seemed very excited that there was a push to get back to the roots of SIGGRAPH.”

The effort worked, resulting in 11 innovative visualizations chosen from dozens of submissions for this year’s Computer Animation Festival. They include a way to visualize tornadoes and a new method for simulating fluid dynamics.

Although the winners include pieces from NASA, Cal Berkeley and the NCSA, they weren’t all done in ivory towers. One standout ET winner was created by a technical specialist at Sony Pictures Imageworks, addressing a subject that’s critical to the development of digital cinema. Despite its staid title, *Visualizing the XYZ Color Space*, Ebert says it’s not an arcane topic.

“This is information that everyone who does computer graphics should know,” he says. “But a lot of people don’t, and this is one of the better visualizations explaining the differences in the color space, and



just how limited some things are. When you look at color gamuts in books, you always see them in 2D. So you don't realize the difference in the volume of space. It's nice to see that a production company can apply their quality of work to teaching fundamental principles."

Ebert thinks the resurgence of scientific visualization in the Computer Animation Festival reflects the real transfer that happens between scientists and people at production studios. That makes sense, since ideas presented at SIGGRAPH often lead to Sci Tech Oscars a few years later. "I see quite a mix of technology now between the visualization community and the movie industry, especially in terms of simulating natural phenomena. People from the effects community are using more and more techniques that have been developed from the visualization community over the past 20 years. They're realizing 'We need that.'"

But Ebert, who has had his own visualization work shown at SIGGRAPH in the past, acknowledges, "Getting production-quality effects into scientific visualization is probably not flowing as well as the other direction. A lot of visualizations are created by computer programmers, and they look it!"

Ebert thinks that Sony's piece this year was particularly effective because Sony has people who are trained to communicate effectively with images. "They understand the importance of timing and editing and choice of camera angles. Fortunately, a lot of the visualization pieces that people will see at SIGGRAPH this year were well produced."

### Students Rule

One of the most heartening things about this year's Computer Animation Festival is the incredibly strong representation of student work. Pieces were submitted by 256 students, and 26 were accepted, so competition was fierce. Since most of these student works were created with the same software used at the major studios, the quality of the winners was exceptionally high. But even more notable was the boldness of the student winners' subject matter, and their pairing of CG and music. As Black observes, "Students are willing to try lots of different things."

A company's business isn't depending on them doing a certain thing, so they have a lot more freedom."

If there's a dominant trend represented by student work at SIGGRAPH 2005, it is the preeminence of French animation schools. No fewer than six student winners came from Supinfocom's campuses in Valenciennes and Arles. Four winners also came from Gobelins l'école de l'image, including *La Migration Bigoudenn*, which won Jury Honors. It's the third time in four years that French students have earned that recognition.

Strong showings were also made by the Florida's Ringling School of Art and Design with three winners, and Britain's NCCA Bournemouth University with three. But the most dazzling student work of all was the UCLA graduate film *9* from Shane Acker, which was awarded Best of Show. (See sidebar, "Best of Show: 9")

This 10-minute tale—told completely in pantomime—has an enigmatic quality that makes it, in Black's words, "A piece that you can watch over and over again. It has a deeper and deeper meaning every time.

Despite its relatively lengthy running time, *9* will be shown in its entirety in the Electronic Theater. The *ET* show, directed by BZ Petroff from San Francisco's Wild Brain, will be projected in HDTV resolution (1920x1080), and will support both 1080p/24 (24fps progressive scan) and 1080i/30 (30fps interlaced).

This year's Computer Animation Festival will undoubtedly present a full complement of dazzling techniques, but "eye candy" alone won't win prizes at SIGGRAPH any more. Cool technical tricks that in the past would have garnered applause are no longer enough. The standard for storytelling continues to rise, and SIGGRAPH's prestige continues to inspire those who submit their work for consideration.

Black laughs when he describes one reaction to this year's tagline for the Festival—"The show cannot go on without your work."

"Somebody came back and said, 'Our work cannot go on without the show!'"



Six student winners, including *Helium*, came from the French animation school Supinfocom. This animation was created with 3ds Max software. (Image courtesy of Supinfocom Arles)

Among the many works in this year's festival that were submitted by overseas contributors are *Jona/Tomberry* (below), which was produced in Germany, and *Lucia* (bottom), which was produced in The Netherlands.



Studio Rosto A.D. 2005



Felix Gnnert & HFF "Konrad Wolf"



*The shadows in this ray-traced image (left) were computed using a new physically-based algorithm that will be discussed in a paper entitled "Soft Shadow Volumes for Ray Tracing." (Courtesy of Samuli Laine, Helsinki University of Technology)*

*A technique for simulating highly-turbulent fluid effects such as smoke and water (below) will be discussed in the "A Vortex Particle Method for Smoke, Water and Explosions." (Courtesy of Andrew Selle, Stanford University; Nick Rasmussen, ILM; Ron Fedkiw, Stanford University and ILM)*



# Seeds of Excitement

## SIGGRAPH 2005 Papers

by Audrey Doyle

Since the first SIGGRAPH conference 32 years ago, its continuing mission has been to be the premier annual conference on the leading-edge theory and practice of computer graphics and interactive techniques. And one of the ways the organization has fulfilled that mission every year since 1973 is through the Papers presentations. This year SIGGRAPH received 461 submissions for the Papers program, of which the committee accepted 98 Papers for publication.

Heightened reality and advanced physics simulation are among the hot subjects being covered in the SIGGRAPH 2005 Papers sessions. To get more detail on how these and other topics are being covered in this year's Papers Program, we recently sat down with this year's SIGGRAPH 2005 Papers Chair, Markus Gross, to gather some of his thoughts. Gross is a professor of computer science and director of the Computer Graphics Laboratory of the Swiss Federal Institute of Technology (ETH) in Zürich.

### **How integral a role do the Papers play at SIGGRAPH and in the computer graphics industry in general?**

MG: The SIGGRAPH Papers program has long been the finest international forum for disseminating groundbreaking, provocative, and important new work. The Papers program has served as a source of inspiration for generations of researchers, and it reaches out significantly into other programs. For instance, research results presented in the Papers program very often become integral parts of very successful courses in the SIGGRAPH Courses program. Also, some of the sketches of ongoing research eventually become complete Paper submissions, and some authors of systems-oriented work have presented prototypes of their innovations in the Emerging Technologies portion of SIGGRAPH.

The Papers program has also been a major source of knowledge and a driving force for the industry. Over the years, we have observed a continuous migration of the most recent research in image generation, modeling, and physics simulation into industrial, entertainment, and gaming applications. The games industry has become increasingly important for advanced visual and physics simulation.

### **What themes or trends do you see regarding the Papers this year?**

MG: There are a number of trends we can point to. The first one is that graphics researchers are doing more and more to bring reality into the computer. Complex lighting and shading models now become “data-driven”; that is, they are based on samples from the real world. This makes it possible to alter and simulate the appearance of human faces photorealistically. To this end, novel camera and acquisition devices have been created.

A second trend is the increasingly sophisticated simulation of physics. Various Papers deal with simulation of the complex interaction of media, such as liquids, smoke, or gas, and solid materials. Also, researchers have started to question the utility of triangle meshes for simulations and propose point-sampled models instead. Finally, various innovations make physics simulations interactive and real time on personal computers. This is very important for the development of more realistic games and will be supported by novel hardware architectures and processing units to be released by the industry very soon. In particular, novel chip generations and physics processing units will accelerate computations in computer games.

A third trend points toward advanced picture and video processing. We will see a variety of methods for panoramic stitching of videos, for

making pictures three-dimensional, and for intelligent and user-friendly editing of video. Such methods might soon become tools people will utilize to edit their latest home videos.

### **What selection criteria did the committee use when selecting Papers for acceptance?**

MG: It is the tradition of the SIGGRAPH Papers program that technical excellence and innovation are the first and foremost selection criteria. We pick the submissions with the most exciting and most creative novel methods, the ones that stimulate future work by others, and the ones that constitute a tangible improvement over the state of the art. Equally important are technical soundness and a proof of concept. The authors have to provide a technically sound description of their innovation, and they have to clearly demonstrate—by comparison and analysis—that their methods work properly and are useful.

### **What challenges did you encounter when reviewing and choosing this year’s Papers?**

MG: The SIGGRAPH Papers program has a unique worldwide reputation as the premier forum for publishing outstanding technical contributions to computer graphics. The average quality of our submissions is therefore extremely high. It is generally very hard to select the subset of Papers for publications.

Over the past years, we have also faced a rapid growth in submission numbers. Retaining the quality of our well-established selection procedure has been a great challenge. We had to modify various aspects of the procedure to make it more efficient and flexible. Since the SIGGRAPH Proceedings are by far the most important publication for academic careers and promotions, we spent an enormous amount of effort to make sure the selection procedure was equally fair to everybody.

### **Which Papers stand out in your mind as potential hits or must-attends for this year’s show?**

MG: That’s difficult to say because in my opinion, all of them are outstanding contributions and advance the state of research in their respective field.

With that said, some of my recommendations include “Performance Relighting and Reflectance Transformation with Time-Multiplexed Illumination,” in which the authors present a novel system for facial



*Left: The paper “Defocus Video Matting” discusses a technique for pulling mattes without a blue screen or special lighting. Instead, it compares video streams from differently-defocused cameras. (Courtesy of Morgan McGuire et al., Brown University)*

*Center: The paper “Animating Gases with Hybrid Meshes” describes a technique for creating fluid simulations that can efficiently conform to arbitrary boundaries. (Courtesy of Bryan E. Feldman, James F. O’Brien, and Bryan M. Klinger of the University of California, Berkeley)*

*Right: A new method for generating realistic 3D meshes of synthetic or real people from sparse marker data is presented in the paper “SCAPE: Shape Completion and Animation of People.” (Courtesy of Anguelov, Srinivasan, Koller, Thrun, and Rodgers of Stanford University; and James Davis of University of California at Santa Cruz)*



appearance acquisition and modeling. This has the potential to become a very important tool for the movie industry.

I also recommend attending the session on fluid simulation, which will feature stunning animations. This session includes the Papers “Animating Gases with Hybrid Meshes,” “A Vortex Particle Method for Smoke, Water, and Explosions,” “Discontinuous Fluids,” and “Water Drops on Surfaces.”

An interesting approach to real-time deformations is presented in the Paper titled “Meshless Deformations Based on Shape Matchings.” In systems and hardware, promising novel graphics hardware architectures for ray tracing will be presented in the Paper titled “RPU: A Programmable Ray Processing Unit for Real-Time Ray Tracing,” and improved ray tracing algorithms will be introduced in the Paper, “Soft Shadow Volumes for Ray Tracing.”

I also recommend that attendees do not miss the session on video and image matting, which includes four outstanding Papers: “Defocus Video Matting,” “Automatic Photo Pop-Up,” “Interactive Video Cutout,” and “Video Object Cut and Paste.” To learn the latest on human animation, I recommend the Paper, “SCAPE: Shape Completion and Animation of People.” For novel theoretical insights I recommend “A Frequency Analysis of Light Transport.”

### Based on the work being presented this year, what predictions can you make about the kind of tools that will become commercially available in the near future?

MG: I expect that data-driven approaches, albeit technically complex and storage intensive, will eventually become commonplace in production environments for the visual simulation of complex surface phenomena. Also, I expect that the next generation of computer games will incorporate very complex, real-time physics simulations. Such simulations will be hardware-accelerated and will utilize methods and algorithms presented in the SIGGRAPH Papers Program.

Some innovations, such as raytracing hardware, might stimulate graphics hardware designers to rethink their traditional graphics pipelines. Finally, the video and image matting session points out the tools we will have at our disposal for advanced video editing on our PCs a few years down the road.

### Any final thoughts?

MG: You can purchase the proceedings at SIGGRAPH 2005 and you can get access to individual Papers through the ACM digital library. Also, we encourage more of the nontechnical SIGGRAPH attendees to drop by and see some of the latest technical innovations. And finally, a fantastic and engaging video of the 2005 Papers will be shown in the SIGGRAPH Electronic Theater. Don't miss it!

#### Monday, August 1

**Session: “Skin & Faces”**  
8:30–10:15 a.m.

**Session: “Hardware Rendering”**  
8:30–10:15 a.m.

**Session: “Mesh Manipulation”**  
10:30 a.m.–12:15 p.m.

**Session: “Illustration and Image-Based Modeling”**  
10:30 a.m.–12:15 p.m.

**Session: “Meshes I”**  
3:45–5:30 p.m.

**Session: “Video & Image Matting”**  
3:45–5:30 p.m.

#### Tuesday, August 2

**Session: “Meshes II”**  
8:30–10:15 a.m.

**Session: “Perception”**  
8:30–10:15 a.m.

**Session: “Motion Capture Data: Interaction and Selection”**  
10:30 a.m.–12:15 p.m.

**Session: “Plants”**  
10:30 a.m.–12:15 p.m.

**Session: “Capturing Reality I”**  
1:45–3:30 p.m.

**Session: “Texture Synthesis”**  
1:45–3:30 p.m.

**Session: “Capturing Reality II”**  
3:45–5:30 p.m.

#### Wednesday, August 3

**Session: “Image Processing”**  
8:30–10:15 a.m.

**Session: “Large Models & Large Displays”**  
8:30–10:15 a.m.

**Session: “Fluid Simulation”**  
10:30 a.m.–12:15 p.m.

**Session: “Reprise of UIST and I3D”**  
1:45–3:30 p.m.

**Session: “Dynamics of Solids”**  
1:45–3:30 p.m.

**Session: “Deformable Models”**  
3:45–5:30 p.m.

#### Thursday, August 4

**Session: “Geometry on GPUs”**  
8:30–10:15 a.m.

**Session: “Transparency & Translucency”**  
8:30–10:15 a.m.

**Session: “Styles of Human Motion”**  
10:30 a.m.–12:15 p.m.

**Session: “Appearance & Illumination”**  
10:30 a.m.–12:15 p.m.

**Session: “Shape & Texture”**  
1:45–3:30 p.m.

**Session: “Ray Tracing”**  
1:45–3:30 p.m.

**Session: “Precomputed Light Transport”**  
3:45–5:30 p.m.



#### SIGGRAPH 2005 Papers Advisory Board

**Chair: Markus Gross**  
Swiss Federal Institute of Technology  
(ETH) in Zürich

**Julie Dorsey**  
SIGGRAPH 2006 Papers Chair  
Yale University (New Haven, CT)

**Eugene Fiume**  
University of Toronto (Toronto, Canada)

**John F. Hughes**  
Brown University (Providence, RI)

Image Courtesy of Andrew Selle, Stanford University; Nick Rasmussen, ILM; Ron Fedkiw, Stanford University and ILM

Max T  
AD



# Gear for Gearheads

## Out on the SIGGRAPH Exhibit Floor

*By Audrey Doyle*

Many of the products you'll see in the booths that fill the Los Angeles Convention Center at SIGGRAPH 2005 evolved over the past several years from the most innovative and groundbreaking research in the field of computer graphics. Here are some of the highlights you can expect to see at this year's Exhibition.

### **SensAble Virtual Clay Modeling**

SensAble Technologies Inc. will showcase several products in its booth at SIGGRAPH. Version 1.0 of the ClayTools system for 3ds max, Maya, and Rhinoceros uses a virtual clay metaphor and offers a true 3D interface with force feedback. Users can smudge, smooth, carve, and tug at models to create game content that is typically organic in nature, including characters, faces, props, and scenery. The ClayTools system includes the ClayTools virtual clay modeling application, the HapticExtender/MX plug-in, and the PHANTOM Omni device.

SensAble also will be showing the OpenHaptics toolkit, which enables software developers to add haptics and true 3D navigation to a range of applications, including medical, games, and visualization. The OpenHaptics toolkit is patterned after the OpenGL API, and facilitates reuse of OpenGL code and integration with OpenGL applications.

### **Dust and Scratch Removal for ARRISCAN Film Scanner**

ARRI Digital Intermediate Systems (DIS), a division of ARRI Cine Technik, will demonstrate a client-oriented solution that performs infrared-based dust and scratch removal while scanning film material for digital intermediate applications. The solution incorporates Kodak Digital Ice Technology, which uses patented algorithms to automatically remove dust, scratches, and blemishes from a scanned image. The technology also produces a list of artifacts that cannot be automatically corrected so that users can correct them manually. The Digital Ice Technology is available as an option for the ARRISCAN.

### **BOXX to Showcase Newest 64-bit Workstation**

The BOXX 7400 series of workstations will be on display at BOXX



*Boxx 7400 Series Workstation*

Technologies' booth at SIGGRAPH. Featuring dual AMD Opteron Dual Core processors and the NVIDIA nForce Professional Media and Communications Processors, the BOXX 7400 workstations support Microsoft Windows XP Professional x64 Edition, enabling users to run 32- and 64-bit applications simultaneously. Featuring the AMD Direct Connect Architecture, which lowers system latency, the Hypertransport bus, dual PCI Express x16-certified graphics for NVIDIA SLI technology, and multi-GPU dual-monitor support, the BOXX 7400 Series is BOXX's most powerful 64-bit workstation. [www.bboxtech.com](http://www.bboxtech.com)

### **A Retooled ZBrush**

New features in the popular ZBrush 2D/3D digital art creation application will be demonstrated in the Pixologic booth. In addition to a retooled interface that's more intuitive and faster than previous iterations of the software, ZBrush2 also offers the ability to edit models in multiple mesh-resolution levels, enabling artists to add low- or high-frequency details on the appropriate level, while ZBrush transfers the changes to other levels. With this version, users also can generate detailed maps for low-resolution base meshes, and hide portions of any mesh, so that they can concentrate on

areas of interest. Artists also can use selective hiding to add edge loops and other mesh-enhancement features. In addition, the program will feature nine new sculpting brushes and depth-enabled paintbrushes and tools. [www.pixologic.com](http://www.pixologic.com)

**Virtools Offers Enhanced VR Application**

Virtools Dev enables users to create interactive applications by graphically assembling “behaviors” via an intuitive interface. At SIGGRAPH, the company will be demonstrating its Virtools Software Suite, which is composed of Virtools Dev 3.5 and the following additional tools and capabilities: a new video engine for displaying live video feeds from a video camera, as well as videos with soundtracks read from local hard drives and streamed from a server; native VRML import capability; support for sound effects, OpenGL 1.5, and 3D textures; a ready-to-use shader library; and a point clouds feature.



*SensAble Technologies ClayTools*

**Keep your Eye on SynthEyes**

Andersson Technologies LLC will be exhibiting the latest version of its SynthEyes 3D camera tracker at SIGGRAPH. SynthEyes enables users to take live footage from a moving camera, 3D track it, export the data to their animation or compositing program, and add their own animation or effects. In addition to 3D compositing, SynthEyes also can be used for 2D tracking. Besides new tracking, solving, user interface, and scene integration capabilities, look for exporters from SynthEyes to the latest animation and compositing programs. For film-resolution work, inquire about the 64-bit Windows XP Pro 64 version. [www.ssontech.com](http://www.ssontech.com)

**InSpeck’s EM to Feature 3D Display Compatibility**

InSpeck, a leading provider of optical 3D digitizers and 3D modeling software, will release the newest version of its EM software, now compatible with 3D display technology. According to the company, attendees will be able to view its trademark 3D data literally jump off the screen, without the use of special glasses or lenticular screens. Many of EM’s tools and functions (polygon simplification, full body model retargeting, morphing, etc.) have been enhanced for this release. [www.inspeck.com](http://www.inspeck.com)

**REALVIZ to Demo SMART Tracking Engine**

REALVIZ plans to demonstrate SMART (Scalable Matching Architecture for Tracking), a new automatic tracking engine. At press time, MatchMover Pro was to be the first of the REALVIZ products powered by SMART, with a release slated for June on Mac, Windows, and Linux. REALVIZ also will be demonstrating two versions of its MatchMover Pro application: MatchMover Pro 3.1 (\$3500) and

MatchMover Pro 3.1 MoCap (\$11,500), a new solution for motion capture of nonrigid objects from any number of cameras. The MatchMover MoCap module requires MatchMover Pro 3.1.

**LightWave Optimized for 64-bit OS**

Stop by NewTek’s booth at SIGGRAPH 2005 for a demonstration of LightWave 3D on the Intel EM64T and AMD64 platforms. The 64-bit version of LightWave leverages the power and range of capabilities of 64-bit technology, including increased processor power and greater memory capabilities. The 64-bit version of LightWave 3D is not expected to be available for commercial sale by SIGGRAPH, but it will be free for LightWave [8] registered owners when it is released.

**Photron to Highlight Primatte for OFX**

At SIGGRAPH, Photron USA Inc. will highlight the latest version of its Primatte chromakey product, Primatte for OFX. The new version is the first release of an OFX plug-in for Photron, and Assimilate’s Scratch Data-Centric Workflow Solution is the first host product to support the OFX version of Primatte. Primatte for OFX features the ability to process a single image or a sequence of images; a user-friendly GUI; internal processing at 16 bits per RGB channel; multilayering; compatibility with almost any color backing screen; multiple undo/redo; and three color-spill removal functions.

**Moving Forward with Endorphin**

At SIGGRAPH 2005, NaturalMotion will demonstrate the continued development and adoption of its flagship character animation product, Endorphin. This product defines the new Dynamic Motion Synthesis sector of the animation market. Endorphin 2.0 allows multiple



*Lightwave 3D*

# House AD

behaviors, animation sources, and active poses on the same character, thus enabling users to quickly produce the desired animation.

**NURBS and Sub Surfaces Combined**

SDLib is Solid Modeling Solutions' comprehensive C++ subdivision surface library. At SIGGRAPH 2005, the company will demonstrate the technology's robust subdivision surface functionality. The key feature SMS will announce and highlight at SIGGRAPH is the integration of the subdivision surfaces in SDLib with the full NURBS functionality available in SMLib, the company's NURBS surface and solid modeling libraries, thereby providing full NURBS-based functionality. [www.smlib.com](http://www.smlib.com)

**Timeline-Based Workflow Model for Antics Pre-Viz**

In Antics Technologies' booth, visitors can see a preview of the company's Pre-Viz Version 2 real-time 3D previsualization software for film, television, and media industry creatives. A highlight of the new software is its completely new, integrated timeline-based workflow model. As the company explains, in Version 1 users built



*Antics Technologies Pre-Viz*

and animated scenes in Direct mode and then switched to Timeline mode to edit and create camera cuts. In Pre-Viz Version 2, this two-stage process is carried out within a single module where live, editable tracks are automatically created for all active objects and props in a scene, and can be edited in situ, in real time. [www.antics3d.com](http://www.antics3d.com)

**Server Management Software**

Pipelinefx will introduce Version 4.0 of qube! Remote Control, the company's server farm management software for game development and 3D animation applications. qube! features patent-pending techniques for batch queuing, process control, and distributed computing. The highly scalable software can be integrated into any workflow pipeline with all applications used in CG production. qube! is operating-system agnostic, has APIs for common programming languages, and is scalable to server farms of any size. [www.pipelinefx.com](http://www.pipelinefx.com)

**A Hotter Fusion**

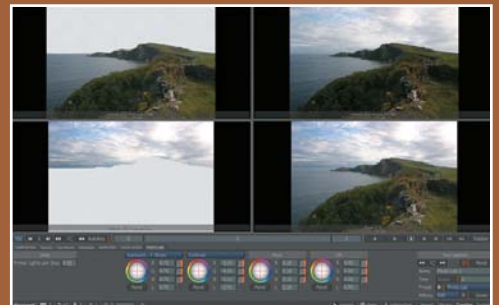
eyeon Software will be providing main-stage demos of Fusion 5 every hour at SIGGRAPH, while also offering one-on-one pods set up for personal demos with developers. The new Fusion 5 3D environment offers a number of important features including the

ability to show scenes from a variety of vantage points. Macros in Fusion 5 are stored in an ASCII file format, which allows them to be opened, edited, and modified in any text editor. Fusion 5 also includes a new noise removal tool that can eliminate grain and noise from images. In addition to allowing users to move 2D image planes around in 3D, Fusion's 3D environment supports geometry, meaning that particles, text, and basic shapes can exist in the same 3D environment as images. [www.eyeonline.com](http://www.eyeonline.com)

**New Effects and Compositing Tools**

Autodesk Media and Entertainment (formerly Discreet) plans to showcase new developments across its product line, including new 3D, color grading, DI, and compositing technologies.

For instance, following its recent release of 3ds Max 7.5, Autodesk will showcase new-technology demonstrations of key innovations designed for next-generation gaming, visual effects, and design visualization needs. In addition, visual effects artists will be able to see developments in Autodesk's new collaborative



*Autodesk Toxic, Version 1*

compositing solution—Autodesk Toxic, version 1, which shipped in April and is targeted at artists working on film.

Digital Intermediate specialists will get exclusive technology demos of real-time clustering technologies applied to color grading with Autodesk Incinerator, a prototype on-set solution based on Discreet Lustre, as well as a preview of technology designed to provide colorists with new creative tools. [www.autodesk.com](http://www.autodesk.com)

**Four-Person, Real-Time Mocap**

Motion Analysis Corporation plans to demonstrate four-person, real-time motion capture at SIGGRAPH 2005. A 16-camera passive optical, all-digital motion capture system, consisting of a combination of eight Eagle-4 and eight Eagle cameras, will be used to capture the motion of four dancers in real time. [www.motionanalysis.com](http://www.motionanalysis.com)

# Curious Labs AD