



Welcome to your Qmags edition of Computer Graphics World

Your Qmags edition of Computer Graphics World immediately follows this introductory letter. Just read the simple instructions below to learn how to navigate your Qmags edition and enjoy its special enhancements.

How to Navigate the Magazine

At the top and bottom of each page of the magazine you will see a navigation bar with 7 buttons. The buttons have these functions:

Previous Page : Clicking on the Previous Page will turn your pages backward.

Next Page : Clicking on the Next Page will turn your pages forward.

Contents : Clicking on the Contents wherever you happen to be in the magazine will take you back to the table of contents page.

Zoom In : Clicking on Zoom In will zoom in to the top of that page. Use the “page down” key on your keyboard to move down to the bottom half of that page.

Zoom Out : Clicking on Zoom Out will take you from a zoomed single page to the double page view.

Front Cover : Clicking on the Cover will take you to the cover.

Search Issue : Clicking on Search will allow you to do a full search of the magazine.

While you can use the standard Acrobat Reader tools for navigation, we recommend that you use the Qmags tools described above. They provide you with all basic reader requirements.

A New Twist On Reality

Introducing



WILDCAT
REALiZM™

Welcome to reality with a twist . . . where you don't compromise creativity because of slow, inflexible graphics hardware. Introducing 3Dlabs® Wildcat® Realizm™ - a family of programmable graphics accelerators that's so advanced, it's more than next-generation good. It's like we reinvented graphics technology and gave it a whole new name. With optimum, real-world application performance and the industry's newest and most advanced visual processing right at your fingertips, animations, intricate CAD models, or complex scientific visualizations are rendered as you imagine them - in real time - with Wildcat Realizm.

***Remove the Boundaries...
Realize Your Potential***

www.3dlabs.com

Features:

- Wildcat Realizm 100 and 200 support AGP 8x
- Wildcat Realizm 800 supports 16x PCI Express
- Flexible floating-point visual processing
- Industry's largest amount of onboard memory
- New-generation framelock/genlock support

3Dlabs®

A CREATIVE® Company

infoNOW 32 at www.onlinecenter.to/cgw

*The Magazine
for Digital Content
Professionals*

ComputerGraphics^{World}

July 2004 www.cgw.com

Artistic Expression

Animation magnifies emotion
in the new documentary,
Ryan, by Chris Landreth

Digital Double
*Spider-Man 2
goes one-up*

Second Life
*Starting over
in a VR world*

Detail-Driven
*Subtlety adds
reality to race ad*

PennWell

\$4.95 USA

\$6.50 Canada

LIGHTWAVE- THE CHOICE OF AWARD WINNING ARTISTS



Photo © Area 51

“LightWave offers the speed, capability and flexibility that allows us to provide the pristine visuals our clients need when they need them. Our artists can work quickly and yet flex their imaginative muscles, with a tool designed to work the way they need to work. LightWave has a great modeler, a great renderer, and a perfect virtual stage designed from the ground up for the filmmaker.”

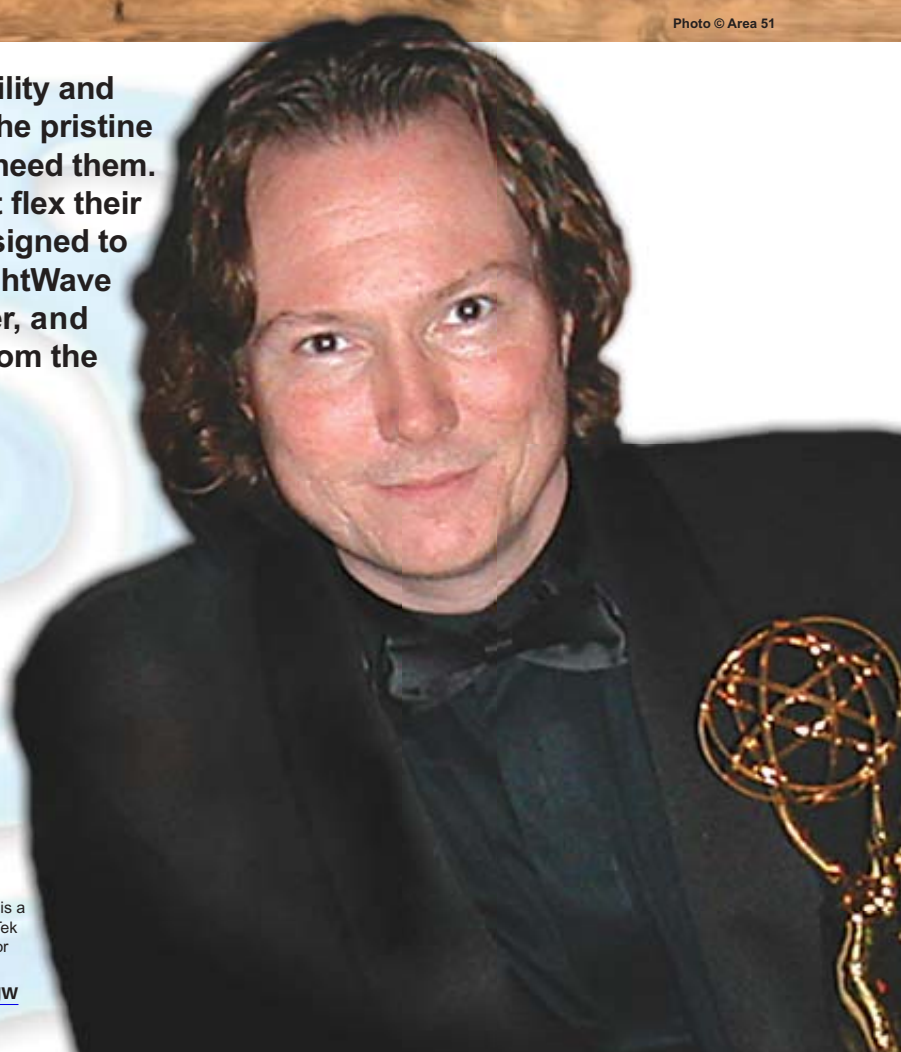
— Tim McHugh, Area 51,
2003 Emmy® Award Winner for
Outstanding Visual Effects for a
Miniseries, Movie or a Special

For more information about Emmy award
winning LightWave 3D®, please call
800.843.8934, or visit www.newtek.com.



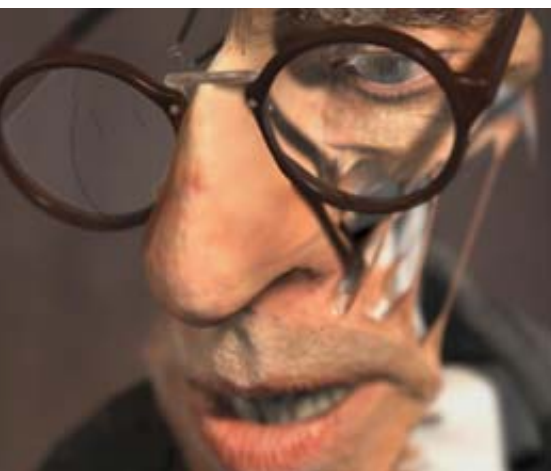
LightWave and LightWave 3D are registered trademarks of NewTek. Emmy is a registered trademark of the Academy of Television Arts and Sciences. NewTek is the proud recipient of the 2003 Primetime Emmy Award for Engineering for LightWave 3D.

infoNOW 1 at www.onlinecenter.to/cgw



ComputerGraphics World

July 2004 • Volume 27 Number 7

Also see www.cgw.com for computer graphicsnews, special surveys and reports,
and the online gallery.

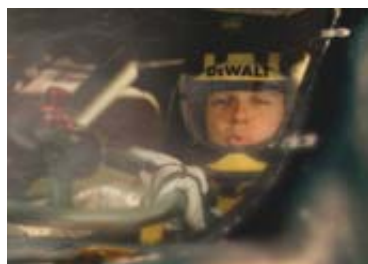
14



22



30



34

Departments

Editor's Note 2

Thinking Socially

Spotlight 4

Products

*Vicon's MX40 camera**3Dlabs' Wildcat Realizm 800**Hewlett-Packard's workstations**Adobe's Video Collection 2.5*

Technology

The Infinite Floor

Market Outlook, Industry News

*Workstation Revival**Accel-KKR Completes Alias Acquisition*

Video Viewpoint 8

Beyond the HD Hoopla

Portfolio 36

SIGGRAPH Art Gallery

Reviews 40

*Alienware's MJ-12**Curious Labs' Poser 5**Ulead's DVD Workshop 2*

Products 70

Backdrop 80

Fantasy World

Features

Cover story

Psychorealism 14

ANIMATION | Using animation to amplify emotion in his short film "Ryan," Chris Landreth redefines the art of documentary filmmaking.

By Barbara Robertson

Another Big Leap 22

FILM | With bigger, better effects than its predecessor, *Spider-Man 2* introduces a more dynamic digital double and a viler virtual villain.

By Barbara Robertson

Life, Or Something Like It 30

WEB | *Second Life's* popular online virtual environment offers visitors a chance to makeover their looks and reinvent their lives.

By Karen Moltenbrey

Drive Time 34

VIDEO | Attention to detail in a virtual set helps make an illusion believable in the new FOX TV commercial for NASCAR racing.

By Karen Moltenbrey

On the cover:

Chris Landreth created a surreal, CG model of Ryan Larkin to portray the character's inner discord in the award-winning short film, "Ryan." See pg. 14.



**Phil
LoPiccolo**
Editor-in-Chief

Thinking Socially

In a new report titled "Moore's Law and Electronic Games," Deloitte Research makes a bold prediction about the future of online gaming: By 2010, online games will become truly mainstream—the total number of online game players should be in the high tens of millions, and may reach as many as 150 million to 200 million globally. Says Paul Lee, Deloitte's director of research and author of the report, online gaming will become so commonplace, it will recede into the background; it will no longer be reserved for the gaming elite.

Douglas Lowenstein, president of the Entertainment Software Association (ESA), shares that view. In his state-of-the-industry speech at the recent E3 conference, Lowenstein explained that for much of the last decade, we've been hearing that online games are the future. In the coming decade, he says, that future will arrive.

Is this vision likely to become reality? It would certainly seem so, if online technology and gaming trends are any indication. Here are some of the major forces converging to propel this new wave of online gaming and a look at the implications for game developers hoping to stay ahead of the curve:

Global connections: By 2010, nearly 450 million homes around the world will have broadband connectivity at speeds greater than 1Mbit/sec, according to the Deloitte study. That will be more than enough to enable robust online gaming experiences.

Online appeal: Online gaming is already surging in popularity among existing game players. Currently 43 percent say they play online games one or more hours per week, up from 37 percent last year and 31 percent in 2002, according to "Essential Facts About the Computer and Video Game Industry," from ESA.

Real players: Game players increasingly like to compete head-to-head with other players, rather than simply play against the computer, ESA finds. Players also find it appealing to co-operate against common enemies, which is possible in a growing number of games, such as *Halo*, in which players can collaborate with each other in order to take on more challenging opponents.

Double lives: Massively Multiplayer Online Role Playing Games (MMORPGs) like *Everquest* and *Ultima* will continue to prosper. But online communities like *Second Life*—which allow players to reinvent themselves in virtual worlds where competition is less important than shared experiences—are experiencing a population explosion (see "Life, Or Something Like It," pg. 54).

Community gaming: The image of the solitary gamer is rapidly fading, says Lowenstein. In the next decade, solo gaming will become the exception, not the rule. Community games like *Rainbow Six* are showing the way toward a fundamental shift in the game-playing experience. The increasing popularity of local-area networks and game centers in which people can meet to enjoy a common passion for games will further accelerate the trend toward social gaming.

For game developers, the opportunities these trends present are enormous. But unlike in the past when success depended on leveraging the latest technological advances, the key to capitalizing on the trends in online play lies in understanding the sociological aspects of gaming. Those who satisfy the player's need to interact and share experiences with friends, family members, and others, rather than creating online versions of existing games, will be the big winners in this rapidly emerging market. ■

In the next decade, solo gaming will become the exception, not the rule.

PHIL LOPICCOLO: Editor-in-Chief
phil@pennwell.com

COURTNEY HOWARD: Senior Technical Editor
courtney@pennwell.com

KAREN MOLTEMBREY: Senior Technical Editor
karenm@pennwell.com

CONTRIBUTING EDITORS:
Jenny Donelan, Audrey Doyle,
Evan Marc Hirsch, Doug King,
George Maestri, Martin McEachern,
Stephen Porter, Barbara Robertson

SUZANNE HEISER: Art Director
suzanneh@pennwell.com

DAN RODD: Senior Illustrator
danro@pennwell.com

BARBARA ANN BURGESS: Production Manager
barbarab@pennwell.com

MACHELE GALLOWAY: Ad Traffic Manager
MacheleG@pennwell.com

KATHLEEN GREAVES: Reader Service Manager
greaves@pennwell.com
(843)705-9243

SUSAN HUGHES: Marketing Communications Manager
shughes@pennwell.com

MICHELLE BLAKE: Circulation Manager
michellb@pennwell.com

MARK FINKELSTEIN: Group Publisher
mark@pennwell.com

COMPUTER GRAPHICS WORLD

Executive and Editorial Offices:

98 Spit Brook Rd.
Nashua, NH 03062-5737
(603)891-0123; FAX:(603)891-0539

CGW ONLINE: www.cgw.com

For customer service and subscription inquiries only:
cgw@omeda.com TEL: (847) 559-7500 FAX: (847) 291-4816
POSTMASTER: Send change of address form to Computer
Graphics World, P.O. Box 3296, Northbrook, IL 60065

We make portions of our subscriber list available to carefully screened companies that offer products and services that may be important for your work. If you do not want to receive those offers and/or information, please let us know by contacting us at List Services, Computer Graphics World, 98 Spit Brook Road, Nashua, NH 03062.



ROBERT F. BIOLCHINI
President and Chief Executive Officer

ADVANCED TECHNOLOGY DIVISION

ADAM JAPKO
President & COO

GLORIA S. ADAMS
Director, ATD Audience Development

ATD PUBLISHING DEPARTMENTS

MEG FUSCHETTI
ATD Art Director

MARI RODRIGUEZ
ATD Production Director

PRINTED IN THE USA GST No. 126813153
Publications Mail Agreement No. 40052420



Evolve > Your work. Your way. Introducing **3ds max 6**.

" Crazy and challenging—that's what the visual effects business is. As a visual effects supervisor, I find **3ds max**® irreplaceable in our pipeline. It provides a multitude of approaches to our complex challenges, the flexibility to support our own scripts and pipeline tools, and customisation capabilities to shape it into whatever we need. **3ds max** allows our artist's to personalise the way they work, yet maintain studio-wide standardisation. With **3ds max**, we're able to stay sane and deliver on-time against the high-paced insanity."

Check out Ben's **3ds max** work and sign up to get a free 30-day trial of **3ds max** at www.discreet.com/evolve.

3ds max /ben

Visual Effects Supervisor, Founder
Ben Girard

Studio
Digital Dimension

Awards
Four time Emmy Award winner

Focus
Motion Pictures Visual Effects
Elf, November '03
The Last Samurai, December '03
Freddy vs. Jason
Duplex
Final Destination II
Reign of Fire
Mr. Deeds

Broadcast Effects and Design
Alias, ABC
TBS SuperStation
Pepsi World Cup Ad
Nascar, FOX
NFL, FOX
Super Bowl XXXVI
Super Bowl XXXIII

3ds max® 6
discreet®

See the Evolution at Siggraph 2004, booth #1700

Discreet is a division of Autodesk, Inc. Autodesk, Discreet, and 3ds max are either registered trademarks or trademarks of Autodesk Inc./Autodesk Canada Inc., in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. © Copyright 2004 Autodesk, Inc. All rights reserved.

infoNOW 2 at www.onlinecenter.to/cgw

spotlight

Your resource
for products, user
applications, news,
and market research

For a direct link to more
product information and
vendor Web sites, click on
www.onlinecenter.to/cgw

products graphics cards

3Dlabs Releases Wildcat Realizm 800

3Dlabs is targeting the professional graphics market with its new PCI Express-based Wildcat Realizm 800.

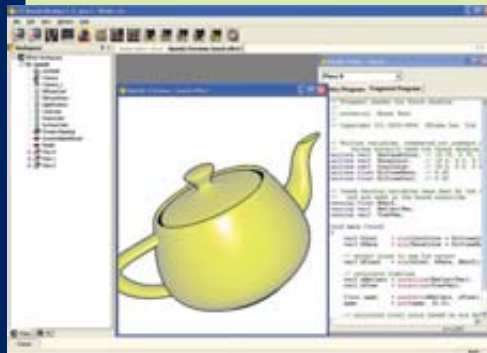
The company's latest graphics accelerator, the Wildcat Realizm 800 combines a Wildcat Realizm Vertex/Scalability Unit (VSU) and dual Wildcat Realizm Visual Processing Units (VPUs). The new card is reportedly capable of more than 700 GFLOPS of floating-point graphics processing. It features 128MB of onboard DirectBurst memory, 512MB of GDDR3 graphics memory, and two, dual-link DVI-I connectors and a stereo connector.

The company also introduced two new AGP 8x-based graphics cards, the Wildcat Realizm 100 and 200. The Wildcat Realizm 100 and 200 incorporate the Wildcat Realizm VPU and up to 512MB of onboard GDDR3 memory.

All three Wildcat Realizm graphics accelerators offer support for OpenGL Shading Language and Microsoft DirectX 9.0 HLSL shader programs. 3Dlabs anticipates shipping the Wildcat Realizm 800

starting next quarter at a cost of \$2799. The Wildcat Realizm 100 and 200, scheduled to ship next month, are priced at \$1249 and \$1599, respectively. —CEH

■ **3Dlabs;**
www.3dlabs.com
infoNOW 101



products motion capture

Vicon Debuts MX Family

Maker of motion-capture solutions, Vicon has announced its next-generation suite of real-time, optical motion-capture systems, Vicon MX. To date, the new Vicon MX family includes the MX40, MX13, and MX3 cameras. Now available for purchase worldwide, all three MX configurations will be on hand at SIGGRAPH 2004 next month.

Designed for real-time and offline applications, such as film, television, and video games, the ultra-high-resolution MX40 is based on Vicon's four-million-pixel, digital CMOS sensor. The most powerful of the three Vicon MX models, the MX40 achieves full-resolution capture speeds of 166 frames per second. The Vicon MX13 is capable of 1.3-million pixel capture and frame rates up to 10,000 frames per second. Finally, the MX3 captures 300,000 pixels at rates up to 240 frames per second.

The Vicon MX family of cameras combine multiple high-speed processors and real-time proprietary image processing, while offering support for a wide array of lenses and integration with third-party devices. —Courtney E. Howard

■ **Vicon;** www.vicon.com
infoNOW 100



products workstations

Hewlett-Packard Unveils New PCs

Hewlett-Packard Company has premiered three new personal workstations—the xw8200, xw6200, and xw4200—which take advantage of Intel, PCI Express, and USB 2.0 technologies.

In addition to a choice of 2D and 3D PCI Express cards, the HP Workstation xw8200 and xw6200 incorporate the Intel Tumwater chipset and Intel Xeon processors with Intel's Extended Memory 64 Technology (EM64T),



video

products

Adobe Systems Ships Video Collection 2.5

Adobe Systems has begun shipping Standard and Professional editions of its Video Collection 2.5, which integrates all-new versions of the company's popular digital video software programs. Adobe Video Collection Standard edition includes Premiere Pro 1.5, After Effects 6.5 Standard, Audition 1.5, and Encore DVD 1.5. The Professional package adds Photoshop CS and steps up to the Professional version of After Effects 6.5.

Adobe Video Collection 2.5 boasts more than 200 new features. Premiere Pro 1.5 has gained advanced support for high-definition video, whereas Premiere Pro, After Effects, and Encore DVD share such Photoshop CS capabilities as non-square pixel support. All the tools in the Video Collection are more tightly integrated and sport common interface elements, heightening ease of use and productivity. Users can take advantage of copy and paste functionality between After Effects and Premiere Pro, as an example. Moreover, Encore DVD now supports timeline markers in AVI and MPEG-2 files created with After Effects and Premiere Pro, enabling and easing conversion to DVD chapter points.

Available now for Windows XP, Adobe Video Collection 2.5 Standard and Professional are priced at \$999 and \$1499, respectively. Users of the previous version of the Adobe Video Collection can upgrade at a cost of \$249. —CEH

■ **Adobe Systems;** www.adobe.com
infoNOW 103



Clarification

The article "Beautiful People" (May 2004, pg. 28) describes how animator Scott Billups used Adobe's Photoshop CS to organize the creation of a pair of digital actors. The article lists some of the tools used to model the "Vitruvian" couple, including Curious Labs' Poser and Alias's Maya, though Billups also employed others not listed in the article. Billups notes that the final geometry will be exported to Maya, but that the following software applications and components are among those that were instrumental in the development of the couple.

The base figures used for the man and woman were the DAZ Michael and Victoria models, along with corresponding head and body morph packages from DAZ (www.daz3d.com). The morph targets for the Michael and Victoria characters were from Zeta Studios (www.zs3d.com). Billups also employed textures from Zeta Studios along with the V3 Xtreme Close Up Xpansion Pack from DAZ and the Cinema Quality Texture pack from PoserDreamers (www.poser-dreams.com).

According to Billups, the couple won't have their final heads of hair until they are re-animated in Maya, but until then, he has used a number of virtual hair products, including the Morphing Flat Top from DAZ and Yann hair by Neftis (available from www.renderosity.com). He has also used hair created by Kozaburo (www.digitalbabes2.com).

In addition, Billups employed Joe LeGecko's Mendoza character and Michael 3 Character Construction Set to manipulate and texture-map the male Vitruvian character. Both are available from PoserStyle (www.poserstyle.com). The color, reflections, and styles of the eyes of both characters were generated from the HiRez Eyes package, also from PoserStyle. —Jenny Donelan

an extension that infuses the workstations with support for 64-bit solutions. In fact, the xw8200 and xw6200 are capable of running 32- and 64-bit versions of Windows and Linux. The xw4200 boasts

Intel Pentium 4 processors, the Intel Alderwood chipset, and a PCI Express graphics card. All three workstations sport Hewlett-Packard's new tool-less, rack-mountable chassis design. —CEH

■ **Hewlett-Packard;**
www.hp.com
infoNOW 102



virtual reality

technology

Infinite Floor

Virtual environments are becoming more realistic all the time, but walking around naturally inside of them has proven to be an intractable problem. Now a team of researchers led by Hiroo Iwata at the Advanced Telecommunications Research Institute and the University of Tsukuba in Japan has developed a novel, self-contained walking simulator that allows a person to stroll in any direction indefinitely in cyberspace while remaining in one place in the real world. Called the CirculaFloor, the mechanism consists of a set of movable, "holonomic" floor sections with omni-directional rollers that reposition themselves depending on how the user is walking. Magnetic sensors measure the motion of the walker's feet, and a computer controls the floor sections accordingly to cancel the motion of each step. By mounting devices that raise and lower the



floor sections, it would be possible to simulate an uneven terrain in a virtual environment. The next challenge, according to the researchers, is to improve the speed of the simulator to enable a faster walking pace. —Phil LoPiccolo

market outlook

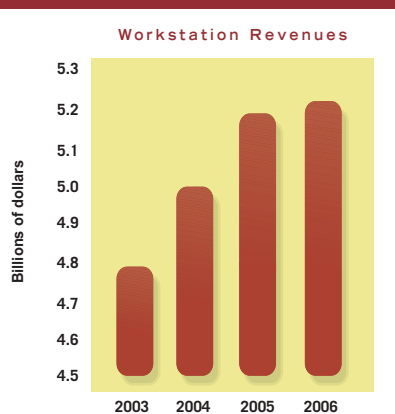
Workstation Revival

Although the technology used to build graphics workstations has changed dramatically in the last five to ten years, the demands of workstation applications and professional users have not. According to Alex Herrera, senior analyst at Jon Peddie Research and author of JPR's latest Workstation Report Series, the professional user is willing to pay a premium for a workstation-class machine and in return, expects to see superior productivity.

Unlike the PC world where value is often measured solely in terms of speeds and feeds, workstations today are evaluated on a variety of qualities, including reliability, security, compatibility, flexibility, and performance. Moreover, because professional users

buy workstations for specific tasks, they pay close attention to certification from software vendors and often buy systems and software together.

Reflecting this demand and improving economic conditions, workstation revenues should be significantly improved during the next three years, as shown in the accompanying chart. As IT budgets



Source: Jon Peddie Research, The Workstation Report Series

loosen, we expect a relatively high replacement cycle, while users—after having their expenditures cut or postponed—play catch up with technology advancements such as 64-bit computing. —By Kathleen Maher, senior analyst, Jon Peddie Research

news

In Brief

Comcast (Philadelphia) and **Exent Technologies** (Bethesda, MD) have launched the first games-on-

demand service. Available on Comcast.net and powered by Exent's digital delivery service, the service provides subscribers unlimited access to more than 60 games across a wide range of genres. Comcast provides parental controls and plans to add new titles each month. **Vicon**

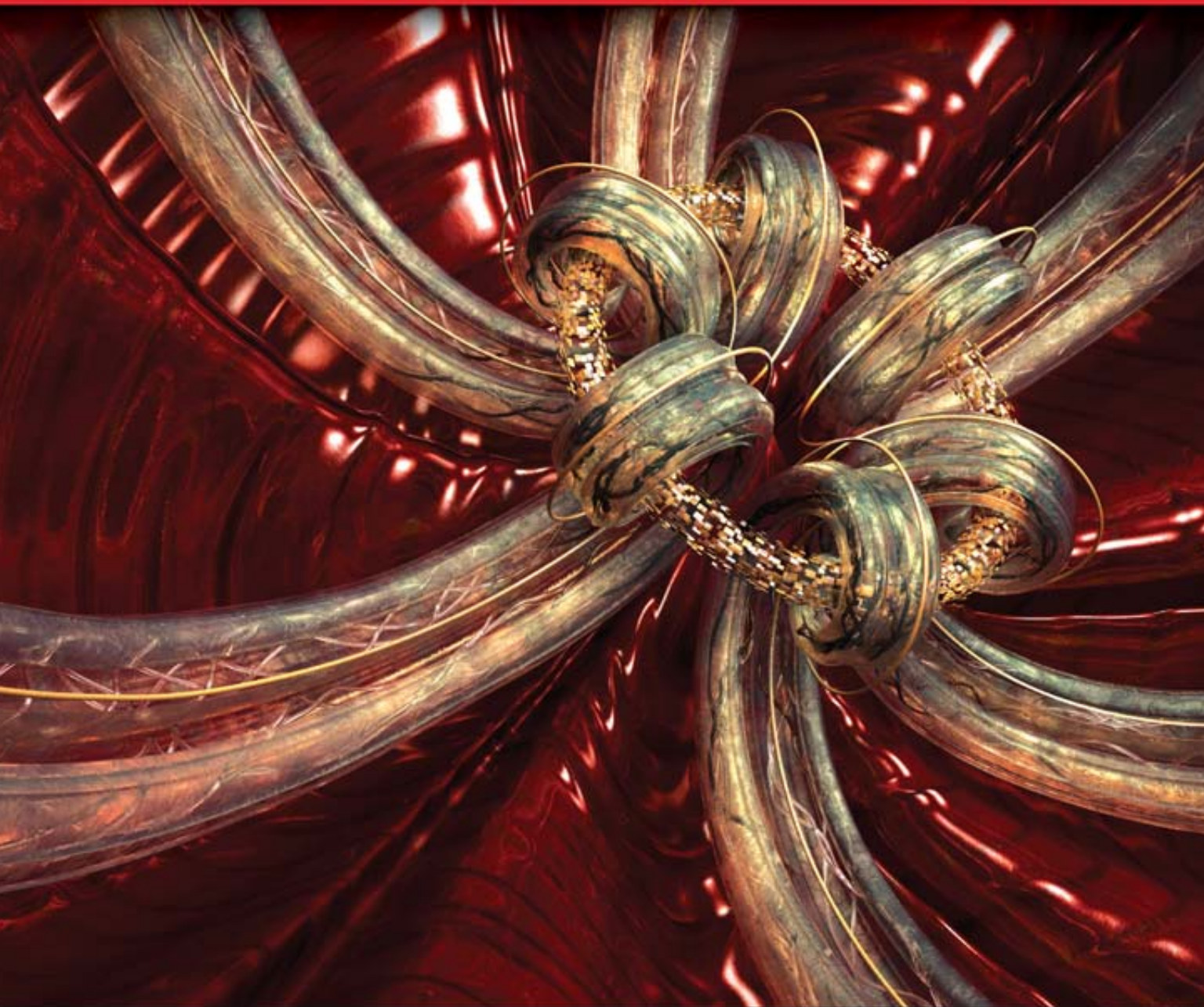
Motion Systems (Oxford, UK) has announced its acquisition of **House of Moves**, a motion-capture studio based in Los Angeles. House of Moves also is expanding to a new production facility. The 12,000 square-foot studio will house a full-body performance stage equipped with a 30-camera Vicon system, a 24-camera rehearsal insert stage, and a facial capture stage. **Accel-KKR**

(Menlo Park, CA) has completed its acquisition of **Alias** (Toronto, Canada) from **Silicon Graphics Inc.** (SGI; Mountain View, CA) for \$57.5 million. **The University of**

Central Florida (Orlando, FL), with the help of **Electronic Arts** (Redwood City, CA), anticipates opening The Florida Interactive Entertainment Academy in the fall of 2005 as part of its School of Film and Digital Media. Bobby "Boom" Beck, Shawn Kelly, and Carlos Baena, animators working for major studios in the feature-film industry, will launch **AnimationMentor.com**, a new online animation school, this fall.

the evolution of 3D

Experience Maya® 6,
a customer driven release packed with literally
hundreds of new features & enhancements.



User requests have led to improvements in character animation, integration with industry standard tools used on every job and the scalability to meet next generation production challenges. Add to this significant advances in modeling, continued refinement of rendering technologies and tools that allow the creation of unparalleled effects and you get the evolution of 3D. Experience the power of the artist and application coming together.

 **Alias**
www.alias.com

© Copyright 2004 Alias Systems Corp. All rights reserved. Alias, Maya and Can You Imagine are registered trademarks and the swirl logo and the Maya logo are trademarks of Alias Systems Corp.
Image created by Kenneth A. Huff (www.kgundong.com). © Alias Systems, a division of Silicon Graphics Limited.

Maya™ 6
CAN YOU IMAGINE®

infoNOW 3 at www.onlinecenter.to/cgw

Visit Alias at SIGGRAPH 2004, Booth 1312

viewpoint
Video

Beyond the HD Hoopla

By Jeff Sauer

If you've ever been to an Apple Computer press conference or keynote speech, you know they can have an atmosphere that's similar to a religious revival, with cheers and applause from the crowd (and there's always a crowd) that ring of "hallelujah." It's not really clear whether those cheers come from employee plants in the audience or are indeed the spontaneous reactions of faithful, fanatical users. But it doesn't really matter. The cheers are often well deserved, even if an inspired presentation trumps technological achievement.

**Jeff Sauer**

is a contributing editor of *Computer Graphics World* and director of the Digital Video Group, an independent research and testing organization for digital media. He can be reached at jeff@dtvgroup.com.

Although seriously overhyped, desktop HD editing has truly arrived

Such was the case at the National Association of Broadcasters (NAB) convention this past April. Final Cut Pro was on stage gaining well-earned "oohs" and "aahs" by editing multiple streams of high-definition video from a Panasonic DVCProHD source in software (that is, with no additional expansion hardware). It was an impressive demonstration, with real-time previewing of four layers of 720p and two layers of 1080i, and Apple deserves credit for showing (with its usual and memorable flair) just how far the industry has come.



Apple's Final Cut Pro HD enables desktop non-linear editing in high definition, but requires a Panasonic DVCProHD videotape recorder deck with FireWire I/O.

Yet this story is both broader than what Apple makes it and a little less spectacular. Make no mistake, Apple's Final Cut Pro does deserve just about all the accolades it receives. In Version 4, it's now a surprisingly mature non-linear editing interface at a remarkable sub-\$1000 price. Moreover, the NAB announcement of a new upgrade, Final Cut Pro HD, hammers home the fact that, just as Final Cut is a professional editing application priced for all creative desktops, editing in high-definition is no longer exclusive territory. Best of all, the upgrade from Final Cut Pro 4 to Final Cut Pro HD is free. Surely HD for the masses is here.

And it's all true. You can edit HD on the desktop with Final Cut Pro HD without extra hardware. But there is a revealing caveat that puts Apple's announcement in perspective: You need Panasonic's new AJ-HD1200A DVCProHD videotape recorder deck with FireWire I/O. (The AJ-HD1200A is priced at \$21,000, although that cost reflects the price of HD equipment, and is not really the caveat.) Granted, Apple was straightforward and didn't gloss over the Panasonic partnership. But somehow amid the hoopla of Apple's show, this piece of the picture got a little obscured, and it was the Final Cut Pro HD announcement that lingered as one of the biggest stories of the show.

Why is Panasonic's new deck so important? FireWire. A FireWire cable is the only I/O "hardware" you'll need to import HD into Final Cut. Of course, adding FireWire to a video deck might not seem like that big a deal on the surface, especially where DV users have been sending footage to Final Cut and many other editing tools via FireWire for years now. But at 100Mb/sec, DVCProHD, or DV100 as it is sometimes known, carries four times the data of 25Mb/sec DV. And processing that much data demands a faster PCI bus, faster hard-disk I/O, and a faster CPU.

DVCProHD does mildly compress high-definition video into a proprietary codec format. And editing it in real time requires both support for that codec and the proces-

Build the Castle of your Dreams



The **IBM® IntelliStation® A Pro**, powered by the **AMD Opteron™** processor, provides workstation users a platform that can run both 32-bit and 64-bit applications. This grants professionals the benefit of long-term investment protection now and a seamless transition for the future.

Coupled with the **NVIDIA Quadro® FX** workstation graphics and **SOFTIMAGE® | XSI®** nonlinear 3D production environment, users can harness the speed and flexibility of these hybrid platforms. The IntelliStation A Pro combines all of these graphics solutions for an unbeatable 64-bit rendering pipe that offers the performance, precision, programmability and quality that professionals demand.



For more information on IBM IntelliStation solutions featuring AMD Opteron processors and NVIDIA Quadro FX graphics boards, visit www.ibm.com/intellistation/



SOFTIMAGE®

infoNOW 4 at www.onlinecenter.to/cgw



©2004 NVIDIA Corporation. NVIDIA and NVIDIA Quadro are trademarks or registered trademarks of NVIDIA Corporation. All rights reserved. "Drakensberg Castle" image courtesy of Frederic St-Arnaud ©2003 Hybride. Designed and rendered with SOFTIMAGE | XSI. Other company and product names may be trademarks or registered trademarks of the respective owners with which they are associated.



Panasonic's AJ-HD1200A DVCProHD deck can send video to Final Cut Pro at 100Mb/sec over a FireWire connection.

sor strength to decode and encode on the fly. Therefore, as much as anything else, Apple's announcement is about the increasing processing power of its CPUs. They've come a long way since the early days of DV in the mid-1990s.

Nothing in that HD mix is really exclusive to Apple or Final Cut, or at least won't be for very long. As powerful as Apple's processors have become, Intel hasn't been standing on the side-

lines, and there's plenty of number crunching power for Windows-based editing applications as well. Naturally, Apple's experience with FireWire—the company did invent it and now integrates it into both its hardware and operating system—has given Final Cut an early advantage working with Panasonic's new deck. However, Windows XP supports FireWire, too. I'd certainly expect to see Windows-based editing companies support the AJ-HD1200A with similar aplomb before too long.

All of that adds up to a trend toward affordable HD editing that is far broader than Apple's free upgrade to Final Cut. While no other editing company has yet been able to match Apple's early support for the Panasonic AJ-HD1200A, several companies are talking about affordable editing of HD.

For example, two editing companies, Pinnacle Systems and Ulead, have already shown native editing of HDV source material in software. HDV is only 25Mb/sec, like DV, but it uses long GOP (group of pictures between I-frames) MPEG-2, which places similarly intense demands on processing power to simultaneously decode multiple frames. Since FireWire is also the transfer protocol for HDV, Pinnacle and Ulead require no additional hardware beyond the HDV deck and a FireWire cable.

On the other hand, "additional hardware" are not dirty words when it comes to editing HD, especially when HD can mean so many different formats, with varying resolutions of 480, 720, or 1080 lines and differing frame rates of 23.97p, 24p, 29.97p, 30p, 59.94i, 60p, 60i, etc. There are also a number of different compression formats, including HDV and DVCProHD, and many others as well. It's potentially far more important to be able to work with all of those formats than it is to be able to edit one or two in software.

Continued on page 12

...If you want the Best...



KONA 2

\$2490

- SDI, HD-SDI, Dual Link 4:4:4 HD-SDI
- PCI-X 133 MHz
- 8-Channel 24-bit AES/Embedded Audio
- Broadcast Quality 10-bit Up-convert
- Broadcast Quality 10-bit Down-convert
- 12-bit HD/SD Component Analog Video Output
- AJA Qrez™ 4:1 Hardware Codec
- DVCPROHD Hardware Acceleration
- AJA QuickTime™ Drivers
- Apple Final Cut Pro™
- Adobe AfterEffects, Photoshop...and Much More!
- Cables Standard—K-box Breakout Optional
- 3-Year Warranty

530.274.2048
Grass Valley, California
www.aja.com

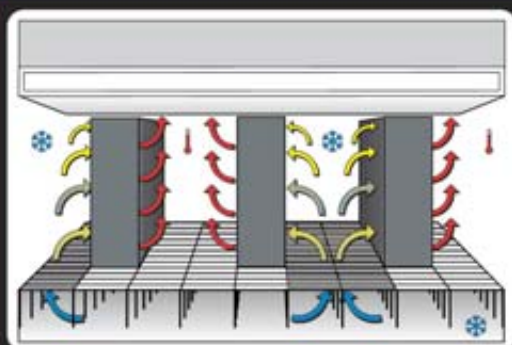
AJA

infoNOW 5 at www.onlinecenter.to/cgw

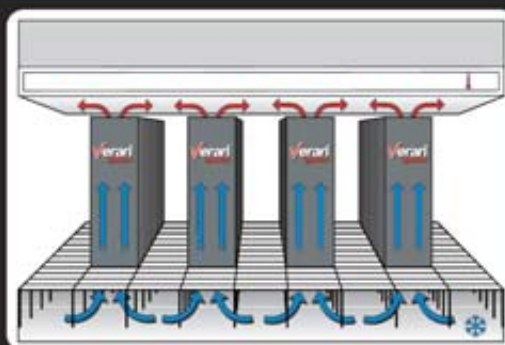
Verari
systems™

the coolest rack on the planet.

The Verari Systems™ BladeRack™ series features our patented **Vertical Cooling Technology**, which means your data center will be the coolest place to be this summer.



A traditional cluster installation can cause serious data center hot spots.



The Verari Systems patented Vertical Cooling Technology helps to protect your systems by eliminating data center hot spots.

The BladeRack family can accommodate up to 88 Nodes or 176 processors and can be easily expanded and upgraded with the latest technology, keeping your organization at peak productivity with the lowest possible operational costs. The BladeRack utilizes the AMD Opteron™ processor, which simplifies your business by giving you the performance you need today with more future capabilities than any other x86 processor. You and your business get the headroom needed for future applications and technologies.



Experience **real** performance by calling **888-942-3800**
or log on to **www.verari.com** for more info
infoNOW 6 at www.onlinecenter.to/cgw

© 2004, Verari Systems. All Rights Reserved. Verari Systems, the Verari Systems logo, and BladeRack are trademarks or registered trademarks of Verari Systems, Inc. AMD, the AMD Arrow logo, AMD Opteron, and combinations thereof are trademarks of Advanced Micro Devices, Inc.

In fact, editing companies such as Avid, Canopus, Leitch, and Matrox have recently introduced proprietary HD codecs to make working with high-definition footage more practical. Most of these formats minimize artifacts by using very modest compression rates, often less than 2:1. However, they dramatically reduce the demands of computer and storage infrastructures needed to edit top-quality video. For Avid and Canopus, these proprietary codecs are primarily software-based, while for Leitch and Matrox, they are effectively tied to hardware cards.

HD Hardware

One of the most compelling trends in editing today is the increasing availability of affordable HD I/O hardware from the editing companies above and independent manufacturers such as AJA, Blackmagic Design, Bluefish444, and

Pinnacle Systems. For far less than the cost of an HD deck, these expansion cards can import and export uncompressed HD footage.

We'll look at these HD hardware expansion cards in more detail in a couple of months. However, one of the main advantages they offer, beyond the critical physical connection to sources, is that they can serve the valuable and very practical function of off-loading processing demand from the system CPU.

This is just the capability Apple's demonstration suggests isn't needed. But while it's surely impressive to edit a couple of streams of compressed HD in software, most editors today are used to working with multiple streams of uncompressed video all the time. And although Apple's demonstration is a wonderful solution for some, adding a card like Pinnacle's CineWave affords FireWire I/O, analog I/O, and the added processing power to edit multiple streams of HD without hitting the limit of the system CPU. For many, that means more efficient editing.

None of these options should diminish Apple and Final Cut's leadership in affordable HD—nor the software-only editing feat, nor the progress toward no-compromise HD editing. In fact, Final Cut led the way toward affordable HD by partnering with Pinnacle Systems' original CineWave HD card some three years ago.

Yet the CineWave hardware is now in Revision 4.6 and is still bringing value to Final Cut Pro users. That should be indication enough that no single solution has cornered the market for efficient editing, especially editing in high definition. Moreover, it's the competition between solutions, and the back and forth between hardware and software, that ultimately drives the industry forward toward the remarkable advancements that companies like Apple show so well. ■■

Appro High-Performance Workstations, Servers and Cluster Solutions

Appro servers and workstations based on AMD Opteron™ processors boost performance on existing Windows® and Linux applications.

Appro WH300 Workstation



- Designed for demanding compute-intensive applications
- Delivers 8x AGP graphics capabilities for content creation, animation, 3D modeling and CAD to meet all your design and analysis needs
- Provides robust memory and storage with up to 16GB of DDR333/400 RAM
- Integrated FDD and CD/DVD drive
- Supports ATI®, NVIDIA and other graphics solutions

Appro 1U Servers



- Dual AMD Opteron™ Processors**
- Design to run cool & efficiently in demanding enterprise environments
 - Ideal for super-computing clusters
 - Up to 16GB of DDR 333/400 RAM
 - Up to 4 HDDs - IDE or SCSI
 - Dual Gigabit ports
 - 24x slim CD-ROM
 - Integrated Cluster Solutions available

Appro 4U Server



- Quad AMD Opteron™ Processors**
- Provides performance and capability for high-end graphic simulations
 - Up to 32GB in 16 DIMM sockets
 - Up to 4 SATA or SCSI HDDs
 - 5.25" bay for CD-ROM or tape devices
 - Dual Gigabit ports
 - 3.5" floppy drive



Double the Density!

Appro HyperBlade Fully Integrated Cluster Solutions



Appro BladeDome Remote
Server Management Option



- Flexible, modular and scalable architecture for rapidly changing environment
- Blade servers fit Appro full-size cabinet (up to 80-nodes) and Appro mini-size cabinet (up to 17-nodes) with the ability to mix and match cluster building blocks
- Dual AMD Opteron™ processors per node
- Up to 16GB ECC DDR Memory per node
- One PCI-X slot per node
- Up to two internal HDDs
- Remote Management Options:
 - In-band and out-of-band control
 - GUI & Command Line Interfaces
- High-Speed Interconnect Options: Myrinet, Dolphin, Quadrics and Infiniband

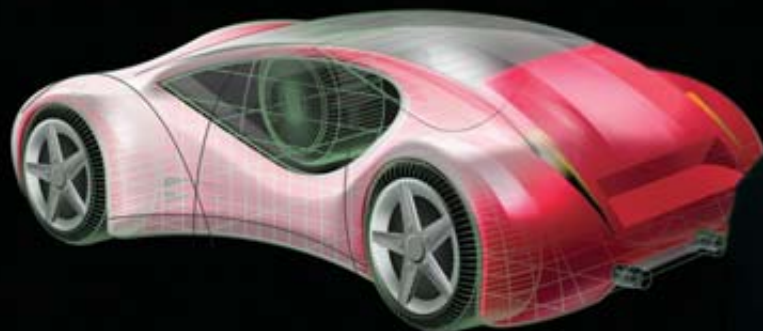
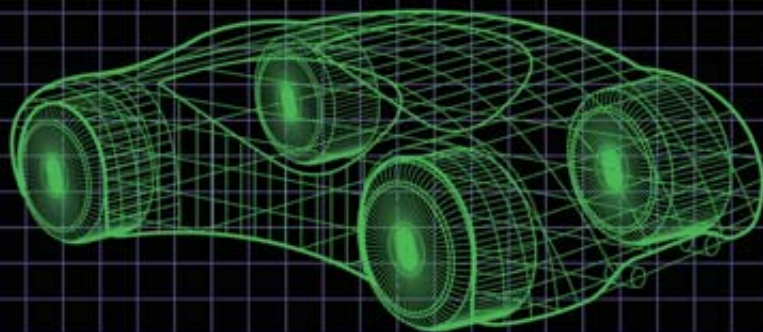


AMD Opteron™ Processors - Shorten run-time cycles and increase bandwidth for processing computing requests.
- 32 bit applications while you migrate to 64 bit computing for long-term investment protection.

For more information, please visit www.appro.com
or call Appro Sales at 800.927.5464, 408.941.8100.



infoNOW 7 at www.onlinecenter.to/cgw



IT WORKS FOR ME



*"...the performance and quality of
ATI's FireGL™ graphics and the
HP nw8000 Mobile Workstation
enable great artists and designers
to be that much greater."*

When world renowned Savannah College of Art and Design (SCAD) chose ATI's FireGL™ graphics and HP's nw8000 Mobile Workstation it gave faculty and students the ability to maintain their competitive edge while developing award-winning digital content. **MARK THOMASSON**, DIRECTOR OF DIGITAL MEDIA TECHNOLOGY, SCAD said, *"...this is where ATI's FireGL™ technology proved itself."*

FireGL™ graphics accelerators are certified and optimized for professional CAD and DCC applications. ATI delivers a top to bottom range of trusted graphics solutions for mobile and desktop workstations with support for dual monitors, both Windows® and Linux platforms and native PCI Express™ x16 lane support.

Find out how ATI's FireGL™ graphics can **WORK FOR YOU** at: ATI.com/firegl.

ATI™ FIREGL™

hp®
invent

© Copyright 2004, ATI Technologies Inc. All rights reserved. ATI and FireGL™ are trademarks and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or registered trademarks of their respective owners.

infoNOW 8 at www.onlinecenter.to/cgw

•••• Animation

*"Here was a guy who had been bursting with life...
You could hardly contain the flow of drawings in his
cubicle at the Film Board. Now here's a guy who is
living out every artist's worst fear."*

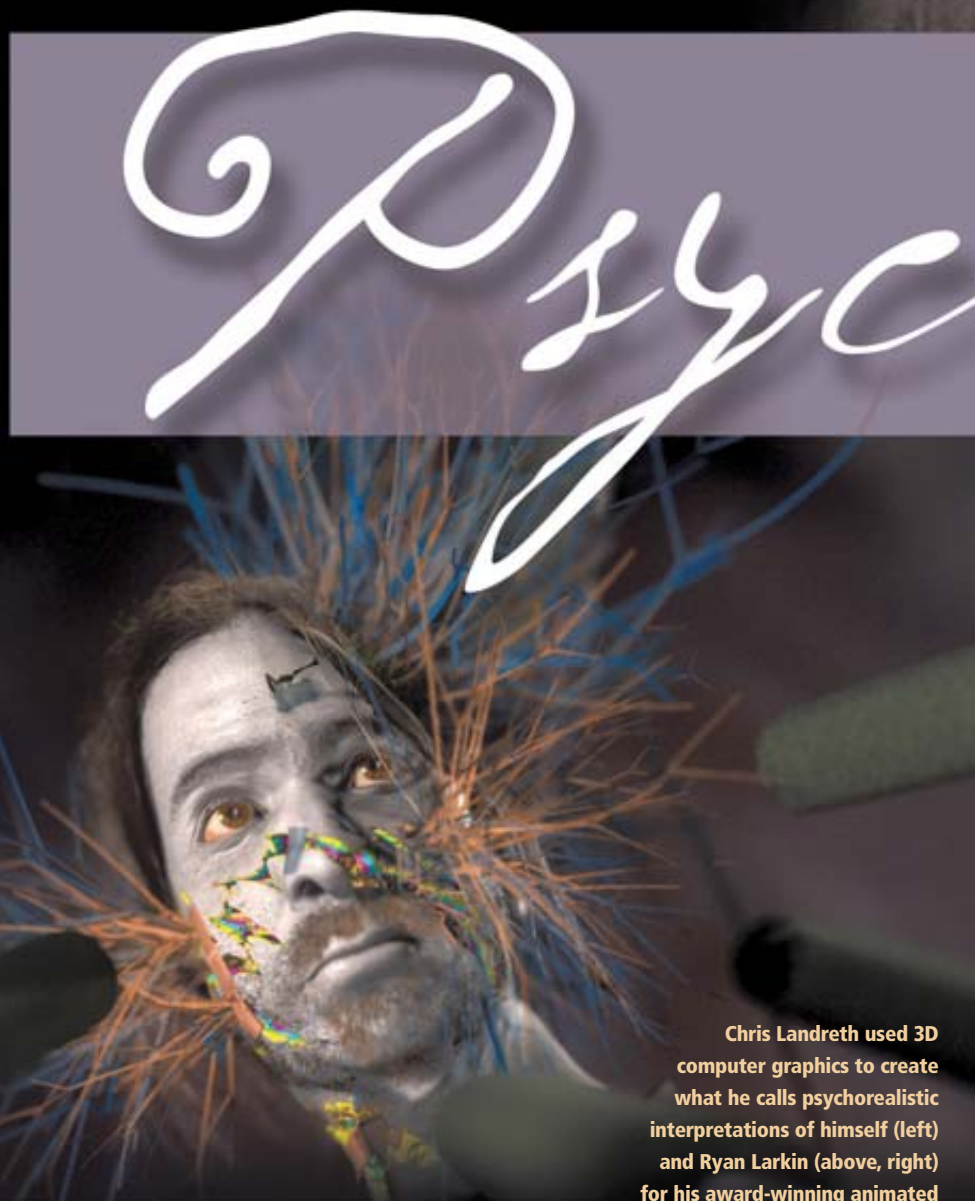
— **Derek Lamb**, former director of the English animation studio at the National Film Board of Canada
describing Ryan Larkin in Chris Landreth's short film, "Ryan."

In 1969, legendary animator Ryan Larkin was at the height of his career. His innovative short film "Walking," one of several films he had made while at the National Film Board of Canada, had received an Oscar nomination and worldwide acclaim. The *Montreal Gazette* had tagged him the "Frank Zappa or George Harrison of animation." He was a star.

But by 1978, Larkin was a cocaine addict, a heavy drinker, out of work, and out of money. Today, he lives in the Old Brewery Mission in Montreal. Still an alcoholic, Larkin panhandles for spare change in front of Schwartz's restaurant on Montreal's Boulevard St. Laurent.

Four years ago, animator Chris Landreth, who had also received an Oscar nomination for an innovative short film ("the end," 1996) was on the selection committee for the Ottawa International Animation Festival and on course for a fateful meeting with Ryan Larkin.

Shortly before the committee was to meet, festival director Chris Robinson had heard through a friend of a staff member that Larkin was in Montreal, panhandling. Robinson thought that if he could track him down, maybe he could bring Larkin to the festival. Maybe he could help him out. He found Larkin on St. Laurent asking people for spare change. After sharing a few pitchers of



Chris Landreth used 3D computer graphics to create what he calls psychorealistic interpretations of himself (left) and Ryan Larkin (above, right) for his award-winning animated documentary, "Ryan."



**Animator Chris Landreth
creates a new form of
documentary filmmaking**

By Barbara Robertson

horealism

beer, Larkin agreed to go to Ottawa on Robinson's assurance that he'd be fed, housed, and provided with beer money. And then, when one of the four committee members dropped out at the last minute, Robinson asked Larkin to fill the slot.

"At first, Ryan was out of it," remembers Landreth. "He'd been hanging out with people on the street for the past 20 years. But by the end of the week, some part of him had remembered what it was like to be with animators, and he came to life." On the last day, after the committee had finished selecting films for the festival, they showed each other their own films. "Ryan was last, and he showed 'Walking' and three or four other films," Landreth says. "Our jaws were on the floor. He was a brilliant animator who did spirited short films that showed incredible creativity. I looked at him and wondered, how did this happen? That's where it began."

At the time, Landreth was out of work, having left a job that didn't match his creative spirit, but he wasn't without resources. "I thought now, if any time, would be the right time to develop a new film," he says. Four years later, Landreth released "Ryan," an animated documentary based on the life of Ryan Larkin. The voices in the film are those of Landreth interviewing Larkin, as well as artists, animators, and people in Larkin's past, and street people in his present. They all speak through 3D characters.

Emotional Realism

"Ryan" takes place largely in a run-down cafeteria. The characters Chris and Ryan sit across a table from each other; the camera moves from one to the other. With the exception of historical footage, everything and everyone in "Ryan" was modeled, animated, and rendered in Alias's

Maya, but nothing and no one look like anything you've seen before, including Landreth himself. It's *My Dinner with André* with surreal, disembodied characters rather than actors.

"My animation work has used and continues to use photorealism," Landreth writes in the notes for "Ryan," "but what I'm most interested in is not achieving photorealism in CGI, but in co-opting elements of photorealism to serve a different purpose—to expose the realism of the incredibly complex, messy, chaotic, sometimes mundane, and always conflicted quality we call human nature. I refer to this as 'psychorealism.'"

Thus, although the character Chris resembles Landreth, his face is painted with gouges that represent his demons and augmented with growths that amplify his emotions: A neon halo pops out of his head when he gets preachy. Something

•••• Animation

Ryan says electrifies Chris's hair. A small purple hand on his cheek reaches out to Ryan.

Landreth altered Ryan even further: Like Larkin himself, the character's face is dissipated and decimated. Large parts of Ryan's head are gone, as is half his sight; he wears glasses, but he has only one eye. When he becomes angry, red spikes erupt from his head.

The combination of Larkin's story and Chris's growing self-awareness as the film progresses—all interpreted by psychorealistic graphics offering a third narrative voice that's sometimes a critic, sometimes a participant—melds the genres of animation and documentary into a new, emotionally powerful art form.

By all accounts, the result has been a major technical and critical success. In fact, by the time the 14-minute film premiered in Cannes on May 17, as a selection for International Critics Week, it had already won three major awards: SIGGRAPH 2004's Jury Award, Prix Ars Electronica's Golden Nica, and The Sun Life Financial Award for Best Canadian Short at the 2004 Worldwide Short Film Festival. At Cannes, it received three Best Short Film awards: the Kodak Discovery Award, the Canal + Award, and the Young Critics Award. And in June, "Ryan" would go on to win the Jury's Special Award at the prestigious Annecy animation festival. Clearly, the story and technique have resonated with critics and audiences.

Setting the Stage

Landreth started working on the film by videotaping interviews with Larkin and, at the same time, making audio recordings and taking close-up photos. "The idea was vague at first," he says. "I was thinking along the lines of Nick Park's "Creature Comforts," in which he interviewed people at a zoo in Bristol and then fashioned an animated film around the interviews."

During the spring and early summer of 2002, Landreth accumulated 20 hours of audio footage and collected reference material including Larkin's films from the Film Board archives. But it wasn't yet enough. He still didn't have a story. He continued interviewing Larkin.

"In August, we had a conversation about alcohol," Landreth remembers. "I hadn't planned to bring the subject up, but I needed to, and it came out the way you hear it in the film, verbatim. At that point, I kind of knew the film was not going to be just about

Painted gouges in Chris's face represent scars created by battles with personal demons. The small purple hand reaches out toward Ryan. Models were created in Maya; hair in Maya's Paint Effects.



DISTORTION, DISORIENTATION

All the sets in "Ryan"—the cafeteria, a lavatory, and the Boulevard St. Laurent—were modeled in Maya and distorted in two ways: The crew added non-linear perspective to objects in the rendered image using an in-house plug-in for Maya; and they smeared selected objects using Maya Paint Effects. "We used this effect to create a dreamy, disorienting space, which reflects the skewed states that both Ryan and Chris experience in their shared environment," notes Landreth.

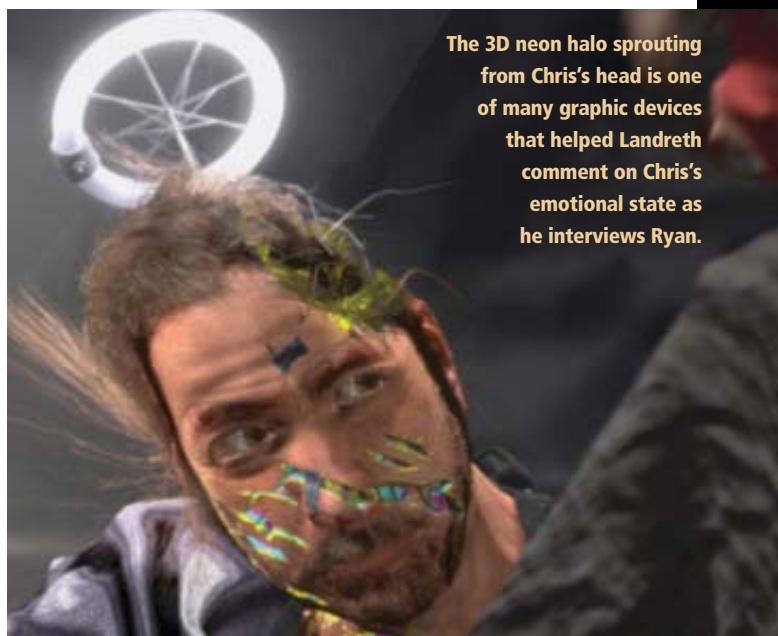
For the street scene, modeler Helen Zotalis Van Emmerik spent four months painstakingly recreating a Montreal city block in 3D from thousands of photographs. And then she distorted it. "She changed it on my direction to make it more painterly, more interpretive," Landreth says. "We used Paint Effects to sully it with paint strokes strategically placed on the 3D model."

Because Paint Effects' paint strokes stick to a model, Landreth could still move a virtual camera around the non-photoreal urban landscape. "The street, storefronts, parking meters all had this painterly quality," Landreth says. "It put us into an interpretive space."

In the cafeteria, Landreth applied the same technique, turning the 3D model of the room, the tables, and the chairs into surreal replicas. But here, he pushed the idea even further. "The cafeteria starts off being sharp and gradually gets degraded," Landreth says. When the conversation between the two animators becomes heated, the cafeteria becomes nearly unrecognizable. "We turned the room into SyFlex cloth and 'melted' it," Landreth explains. He even extended the distortion to Zaz, one of the hapless characters the camera pans past in the cafeteria, by melting him with SyFlex software and then pouring his body across a table like a drunk passed out at a bar. "A few of the secondary characters are based on real people that Ryan knows in the mission, but Zaz, the melting guy, is all my creation."



The 3D neon halo sprouting from Chris's head is one of many graphic devices that helped Landreth comment on Chris's emotional state as he interviews Ryan.





Shanan and the rest of our team would be happy to help you configure your Anthro workstation.

If you can imagine it, we can configure it.



Whatever your heart (or workspace) desires, Anthro can come up with a furniture solution just for you. Everything from Anthro is flexible, modular and strong. Strong enough to come with a Lifetime Warranty. And with 75 different accessories to choose from and hundreds of possibilities, you can always reconfigure your Anthro furniture to fit your changing needs. Imagine that.

For a free catalog, contact us at ANTHRO.COM or 800.325.3841.



ANTHRO
Technology Furniture®
– Fast and Friendly!

•••• Animation

Ryan.” The interviewer, whose mother had alcohol problems, had become enmeshed in the story; the conversation about alcohol became a climactic moment in the film.

By December, Landreth had written a script and had knitted together an independent production with the help of Copper Heart Entertainment in Toronto. The “Ryan” production team received grant money from the Canada Council for the Arts, and then the National Film Board of Canada signed on as co-producer. In addition, Seneca College in Toronto gave Landreth studio space and recommended a few graduates from its animation program to work with him.

Creating the Characters

During the interviews, Landreth drew sketches of Chris and Ryan. These drawings became the basis for the 3D representations of the two animators who would appear in the film. “Our visual appearances reflect pain, insanity, fear, mercy, shame, and creativity,” Landreth notes.

The models for the two other main characters in the film—Derek Lamb, who was Larkin’s close friend and executive producer, and Felicity Fanjoy, his former common-law wife—were based on Larkin’s drawings. “Chris and Ryan’s photorealism is interpreted through my psychorealistic perception of them,” Landreth says, “but I wanted to show Derek and Felicity as Ryan perceives them. The best way to do this was through his drawings of them. So, we took his sketch patterns and mapped them onto 3D articulated models of Derek and Felicity, giving them the sketchy appearance you see in the film.”

Derek slides into view as an animated image in an easy chair, but Felicity sits at the table with Chris and Ryan. As she reminisces with Ryan, he puts his hand over hers.

Although the characters’ performances are realistic, Landreth

chose not to rely on motion capture. Landreth himself handled about half the facial animation; the Seneca animation grads completed the rest. “There’s a certain animator pride in not using motion capture,” he says. “But to get a believable performance that wouldn’t look hand-animated, we had to get out of the pose-to-pose mind-set that animation students have.”

With pose-to-pose animation, animators place a character into one pose and then another, and the computer handles the movement in between. “If you don’t do anything except that, the character has a stilted quality,” Landreth says. “So, animators try to finesse that to get a more fluid motion, but there is still a residue left behind—more in the mind-set, perhaps, than in the animation.”

To illustrate what he means by a pose-to-pose mentality, Landreth uses the crew’s animation test line, a bit of Ryan’s dialog: *I don’t pay taxes. I don’t pay union dues. This is take-home. This is take-home pay.* He shows how the animators would strike a pose with each sentence. “This is something you see a lot in studio animation,” he says. “A character says something and does a gesture, says something else and does another gesture.”

Landreth explains that this type of animation not only looks stilted, it wasn’t the way Ryan behaved. “Ryan gestures a lot, but one of the striking things is that his hands do something totally unconnected with what he’s saying,” Landreth says. “It’s not even the same timing. So, getting that nuance into the animated version of Ryan took a lot of thinking and effort.”

Thus, Landreth and CG supervisor Dave Baas taught the animators to use a “straight-ahead” animation style. “It’s what you might do with claymation, where you don’t have the luxury of in-betweening,” Landreth says. Rather than, for example, having Ryan take a bow through a set of poses—stand, put right arm out, bend in the middle, stand up—he asked animators to think about the behaviors of different parts of the body. “You might imagine

how Ryan’s arm would operate over two or three seconds, animate the full motion of the arm, and then do the rest of the body,” he says. “It might or might not work, but you would have the flow of the whole motion.”

Landreth also worked on ridding the animation of the typical CG spliney look in which movement happens in smooth arcs. “I tried to get the idea to the animators that we’re all twitching meat,” he says. “The meat part is that we have mass, momentum, and weight; the twitching part is universal in the way people move. People don’t move in curves. They twitch into motion impulsively, generally with a fast ease in and a slow ease out. It looks

like a sawtooth pattern, not a sine wave.”

To create textures for Chris and Ryan, Landreth’s team stitched together photographs in Adobe’s Photoshop and applied them to



Ryan’s model dramatizes his feelings as he reminisces with his former common-law wife, Felicity. Her representation, a 3D model textured with paint strokes, was based on a sketch by Larkin.



Raid solutions made easy...

Arena Pegasus NAS

Storage solutions for any environment

When it comes to saving your multiplying stores of digital assets, Arena Maxtronic introduces the Pegasus NAS solution. The **Pegasus 220GT**, **410GT**, and **820GR** combines advanced hardware design and software technology to deliver total security, high-performance and seamless cross-platform centralized data management. The Pegasus NAS is one of the first NAS systems to support AFP 3.1, offering the ultimate storage solution by providing efficient, high-speed network-transmission and data security for SOHO, small advertising, design studios, and image processors. At Arena - *we make RAID solutions easy.*

- Crossplatform file-sharing between Windows (SMB3.0), Mac (AFP3.1) and Unix/Linux (NFS)
- Supports Microsoft 2003 Server domain level (PDC) with user-sensitive security
- Front mounted LCD for quick configuration and web-based GUI
- Firmware remotely-upgradable via web
- SMTP (email) failover notification
- Easy configuration, installation and maintenance
- Support RAID level 3 and Disk Roaming
- Support AFP3.1/SMB3.0

infoNOW 10 at www.onlinecenter.to/cgw



Call: 877-GO-ARENA | www.maxtronic.com

•••• Animation



the 3D models. But for Derek and Felicity, they used Paint Effects to mimic the strokes in Larkin's drawings and to create the animated CG models that looked hand drawn.

The lighting also contributes to the dramatic effect. Although hero characters typically have rim lights shining on them from behind, Landreth chose another option. "That's not the way things looked, so we decided not to use it," he says. Instead, he and rendering supervisor Belma Abdicevic replicated the cafeteria's institutional lighting. "We had high-intensity overhead lights, lights bouncing off walls, diffuse lighting. The light is flatter than we might want, but less overly dramatic, too. And a rim light would have given away the lack of subsurface scattering." Therefore, even though the lighting matched reality, because it was not the typical treatment given to hero CG characters and movie stars, it added to the surreal effect.

As for other techniques and tools, Landreth stayed with Maya for rendering and picked Discreet's Combustion for compositing. "We used Maya 4.0," he says. "We didn't even have Mental Ray that's in Maya now, but we were able to have Paint Effects integrated into it." For editing, although he used Adobe's Premiere at the storyboard stage for conceptual editing, he turned to postproduction studio Coptor Production for the final edit. "I'd sit on a couch while the editor did all the dirty work," he says, noting that the studio used Apple's Final Cut Pro for online editing.

A Filmmaker's Challenge

All told, the production took 18 months. A three-person professional staff—Landreth, a CG supervisor, and a lighting/rendering/compositing specialist—was supported by four animators, one texturer, one character modeler on the student staff at Seneca College, and 20 volunteers.

"Ryan," which was created as an independent production by an out-of-work animator stands as a challenge to filmmakers to create their own films. "All these resources—Copper Heart, the National Film Board, Seneca, grants, donations, and many vol-

Left to right: A photo of Ryan Larkin. A CG model of Larkin. Landreth's impression of Ryan, sketched during the interviews. The final character Ryan, created by carving Landreth's CG model to match his surreal, conceptual drawing.

MODELING SURREALISM

All the 3D models for the characters in "Ryan" were created in Alias's Maya. "We started with subdivision surfaces, but converted to NURBS," says Landreth. They were also destroyed and disturbed with Maya. "We used free-form fillet blends and trims, and added lots of embellishments with NURBS in Maya for the character Chris. For Ryan, we used mostly NURBS with a lot of construction history."

For hair—and for many of the effects in the film—Landreth used Maya Paint Effects. "There's a stroke tailored for hair in the Enhanced version of Maya 5," Landreth says. "You can draw a stroke, a thin line, and get tons of hair, and it's good hair."

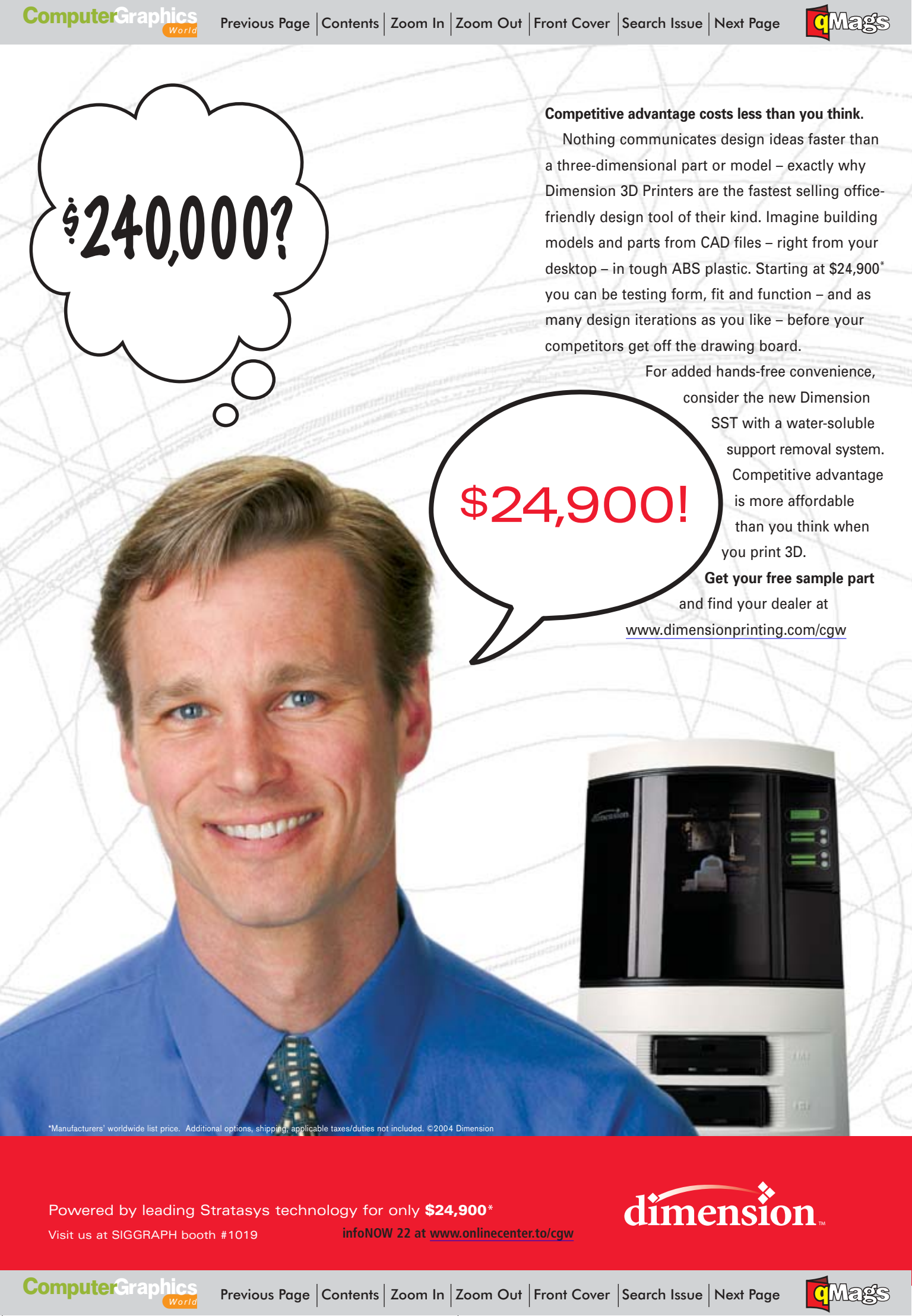
By organizing Chris's model into layers, Landreth reduced the amount of geometry the animators needed on-screen while allowing them to toggle back and forth between the psychoreal and real models. This came in handy for one scene in particular in which Chris is looking into a mirror. "You see Chris without gouges on one side of the mirror and with gouges on the other," says Landreth. "The model with all the cut-out stuff and embellishments was always there, but the animators had the option to work faster without all those things."

For Ryan, though, because he rarely appears totally intact, the animators primarily worked with the hollowed-out face. The complete face can be seen only on a younger Ryan. In one scene, for example, as he and Felicity remember happier times, the young 3D Ryan dances joyfully behind them alongside the animation in one of his early films.

unteers—came together to produce this film because people believed in it," Landreth says. "The film has a long credit roll and nice production values, and it is being promoted and distributed by the National Film Board, but it was done quite on the cheap. I look forward to seeing independent features done in this way."

In making "Ryan," Landreth took professional and personal risks. By working with animation, he reaches beyond the limits of documentary filmmaking. By creating a documentary, he explores new possibilities for animation. And by using 3D graphics to create emotional realism rather than photorealism, he dares directors, animators, and computer graphics professionals to think beyond cartoon animation, creature animation, and digital doubles. Given the results, these were risks worth taking. ■■

Barbara Robertson is a contributing editor of Computer Graphics World and a freelance journalist specializing in computer graphics, visual effects, and animation. She can be reached at BarbaraRR@comcast.net.



\$240,000?

Competitive advantage costs less than you think.

Nothing communicates design ideas faster than a three-dimensional part or model – exactly why Dimension 3D Printers are the fastest selling office-friendly design tool of their kind. Imagine building models and parts from CAD files – right from your desktop – in tough ABS plastic. Starting at \$24,900* you can be testing form, fit and function – and as many design iterations as you like – before your competitors get off the drawing board.

For added hands-free convenience, consider the new Dimension SST with a water-soluble support removal system. Competitive advantage is more affordable than you think when you print 3D.

Get your free sample part

and find your dealer at

www.dimensionprinting.com/cgw

\$24,900!



*Manufacturers' worldwide list price. Additional options, shipping, applicable taxes/duties not included. ©2004 Dimension

Powered by leading Stratasys technology for only **\$24,900***

Visit us at SIGGRAPH booth #1019

infoNOW 22 at www.onlinecenter.to/cgw

dimension™

..... Film

By Barbara Robertson

The challenge for visual effects studios that work on sequels is always the same: Do better. And when the original film is as successful as Columbia Pictures' *Spider-Man*, which earned \$404 million in the US and \$807 million world wide, that pressure increases as it has for *Spider-Man 2*. The sequel—which brings back director Sam Raimi along with stars Tobey Maguire as Spider-Man and Kirsten Dunst as Mary Jane Watson—opened June 30.

"You can't be in this industry, even with a successful franchise, and say, 'let's do it all again,'" says Lydia Bottegoni, visual effects producer at Sony Pictures Imageworks for *Spider-Man 2*. "You have to improve and get more efficient so you can put more on the screen."

The first film's success provided the means. "We had a 20-percent bigger budget than the first film, and the percentage of the total budget, 25 percent, is higher," says Bottegoni, adding that the Imageworks crew nearly doubled. "We had more shots than the first movie, and the CG characters were more difficult, but we had the same amount of time." All told, Imageworks handled 836 visual effects shots for this film, approximately 300 more than for the first film. The crew created the shots primarily in Alias's Maya and Side Effects Software's Houdini running on IBM workstations equipped with Nvidia graphics cards. Compositing was handled by the studio's own Bonsai software with Discreet's Flame

Sony Pictures

Imageworks creates dynamic digital doubles, treacherous CG tentacles, and a swinging virtual city for Spider-Man 2

All Images ©2004, courtesy Sony Pictures Imageworks

Anot



and Inferno playing supporting roles; rendering was accomplished by Pixar's RenderMan with an assist from Mental Images' Mental Ray. The in-house visual effects editors work on Avid systems.

In comic-book superhero movies, putting more on the screen usually translates to more villainous villains and more dangerous stunts. And, indeed, Spider-Man's new nemesis, the multi-tentacled Dr. Octopus (actor Alfred Molina), is particularly treacherous. In the first *Spider-Man*, the villain was masked and rode a hoverboard. In *Spider-Man 2*, Molina's character maneuvers and is maneuvered by four mechanical tentacles attached to his back, and he doesn't wear a mask.

Part Man, Part Machine

"Our villain truly is amazing, and there's no paradigm for him," says Imageworks' John Dykstra, who returned as visual effects designer. "An enormous amount of energy went into designing how Doc Ock's tentacles moved, how they carried him around, and how they interacted with the environment."

In some shots, the tentacles are puppets created at Edge FX, but in many shots, they're CG. "They tried to use the puppets on the set as much as possible, but it involved a lot of setup and results in a lot of puppeteers to paint out," says Scott Stokdyk, visual effects supervisor, noting that managing four tentacles required 16 puppeteers. Moreover, because the tenta-

cles could stretch out, sections of practical appendages in various lengths had to be swapped during a shot. "Our CG tentacles were useful when there was close action and Doc Ock had to reach around with a longer arm, as well as in the dynamic fighting shots," Stokdyk says. "They could spool out from his back."

The CG tentacles were made of vertebrae strung on a cord like beads on a string. "We built them like a big Lego set," says CG supervisor Peter Nofz. Cables that could contract and expand held them in place and caused them to vibrate. At the end of each was a claw-foot on the lower tentacles, a "death flower" with a camera tucked inside the upper. "We built them from the get go as subdivision surfaces," says Nofz. "There was no way we could have carried them through the pipeline as NURBs because they were so complicated." Sometimes the tentacles were attached to the actor, and sometimes Doc Ock was fully CG.

Animating digital Doc Ock's clothing was difficult as well, "He had layers and layers of clothes that we had to simulate simultaneously," says Nofz. "We tried to simulate separate layers, but they were interacting with each other too much."

Rather than use the system that had worked for Stuart Little, the team decided to switch from clothes made with panels and patterns (like real clothes) that were modeled separately, seamed together, and simulated. Instead, they used "object"

her Big Leap

●●●●● Film

cloth that, because it uses a model based on a cyberscan, includes wrinkles and draping. “The theory is that it’s faster because you don’t have to go through iterations to see how the cloth drapes,” says Stokdyk. “You get accurate draping from the cyberscan, and that held true in many cases.”

Because object-based cloth simulation wasn’t part of Maya, Imageworks worked with Alias to put it into their pipeline. Even so, the final result required hand tweaking. “Once the simulation looked good, we needed to separate the layers when we’d see interpenetrations,” Nofz says.



When Doc Ock's tentacles spool out from his back, animators found that CG tentacles were more practical to use than puppets.

For hair, however, the studio simply upgraded its existing in-house tools to take advantage of faster hardware and such improvements in RenderMan as deep shadows.

New Skin

“Skin was the big thing,” says Stokdyk. I knew from the start that our CG Doc Ock would be our biggest challenge because a lot of the shots were very close to him. We looked at all the skin that had been done, and I was most impressed by Paul Debevec’s work with his Light Stage that was in the SIGGRAPH 2000 technical papers (see November 2002, pg. 16.). We hired Mark Sagar who also worked on the paper.”

The Light Stage system allowed the crew to create Doc Ock’s skin from photographs rather than calculate CG flesh using algorithms to simulate, for example, subsurface scattering in skin. “In *Spider-Man*, there’s a scene where Spidey climbs a wall and we see Tobey’s face,” says Nofz. “We worked for weeks and weeks and hit the wall. When you have a shader with a zillion controls, there are too many controls and variations to dial in. With this [Light Stage-based] system, the question of whether the skin looked right or not went away. This is his skin; it looks right right away.”

Nofz estimates that it took the R&D team more than six months to integrate the new system into their pipeline. “It’s a completely different technology,” he says. “There is no such thing as a texture. Instead, there are hundreds of textures.” Rather than calculating math, the system derives an image by

MAKING FACES

Using Paul Debevec’s Light Stage at the Institute of Creative Technology, Imageworks took photographs of actors Alfred Molina and Tobey Maguire that would provide textures and lighting for the faces of their digital doubles. Four film cameras shooting at 60 frames per second surrounded each actor, who was seated in a chair. Above him, an armature with strobe lights down its length rotated around the chair in eight seconds with its lights firing at 60 frames per second. At the end of one rotation, each camera produced 480 images.

“If the actor held still, we had the head in the same position but with a different lighting condition on every frame,” explains Scott Stokdyk, visual effects supervisor at Imageworks. “Because light is additive, we could combine those images based on our CG light to recreate the face. We don’t apply a texture to a model; we derive textures as a combination of images, color, and intensity, all calculated by a shader.”

Because the CG character needed to have the same color and brightness of light used in the live-action shots, the crew took fisheye images of the set bracketed for high and low exposures to get high-dynamic-range, 180-degree images. Combining two images gave them 360-degree environment maps, which, in effect, were giant spheres that could surround the CG character. “We used those images to calculate the color and intensity of light from the environment that would be shining on the CG character’s head,” says Stokdyk. For example, if the set was dark on one side, the shader would not access images from that side; it would instead use a subset of the images to derive the textures.

“At the end, a RenderMan shader accesses the series of textures, the environment map, and any added CG lights and combines them to output an image,”

Stokdyk says. “We remove the specular component from the Light Stage information and add it back in based on the CG camera and light, but everything else you’d normally do with layers such as subsurface scattering, veins, and so forth, is captured in the textures based on the Light Stage photographs. The only painted maps we did were to clean up those photographs.”

There was one problem: the actors changed their appearance. “We got Tobey with bright red hair from *Seabiscuit* and Alfred with sideburns that were removed for *Spider-Man*,” says Nofz. “That meant we had areas in the face with erroneous data, so we had to come up with techniques to create skin from adjacent skin. Also, our cameras didn’t capture information inside the nostrils or ears so that had to be created artificially by copying and pasting from adjacent areas.” Although some of this process was automated, much was handled with hand painting... a huge task.

“We had 480 images from each of four cameras and all the images had to line up,” says Stokdyk. “It was the paint fix from hell.”

Despite the advantages of creating faces from photographs, Nofz predicts that ultimately, math will win over photography. “This system is expensive to set up,” he says. “You need access to the actor, put him into the contraption, color correct each image, stabilize it, paint missing areas—there’s a lot of labor involved before you can say here is my first version of the character. We learned a lot in the process so the next round would probably take less time, but I think this is a little cheat that will help until the subsurface scattering approaches get better.”

“If we ever do this again,” Nofz adds, “we’ll make sure we get the character exactly as it will appear in the movie.”

Time to upgrade your CRT? Draw on the professional choice.



Replace



Upgrade your View and productivity with matching ViewSonic accessories from the ViewMate® Desktop Collection.

SONY® CRTs ARE OUT OF THE PICTURE.

VIEWSONIC® GIVES YOU OPTIONS. CAD and graphics professionals who prefer the precision and affordability of CRTs should check out ViewSonic's 20" viewable models. Or look into large-screen LCDs that are crisper and more detailed than ever. Review all your options at ViewSonic.com. With more than 1000 awards worldwide, ViewSonic is the #1 monitor brand in the US* for price performance.

Find out **Where to Buy** at ViewSonic.com or call **800-888-8583**

ViewSonic®
See the difference.®

*See ViewSonic.com for detailed awards list. Leading stand-alone, branded monitor by sales (CRT and LCDs combined; iSupply/Stanford Resources Monitorak® and Flat Panel Monitorak®, 1Q04 report). Specifications and pricing subject to change without notice. Corporate names and trademarks stated herein are the property of their respective companies. Copyright © 2004 ViewSonic Corporation. All rights reserved. [11838-00E 04/04]

infoNOW 12 at www.onlinecenter.to/cgw

●●●●● Film

rapidly looking up and selecting skin textures from a huge table of photographic textures and puts that image onto the model.” (See “Making Faces,” pg. 48.)

Hero Performances

For the digital doubles’ facial animation, the studio used a motion capture system. “John Dykstra directed Tobey, and I directed Alfred doing performances that we later imported into CG models of their faces,” says LaMolinara. “An animator could try to copy the performances, but what’s the point when you want an exact replica not a caricature?”

To capture enough data to create a believable performance, each actor wore around 150 tiny reflective markers on his face. “We tried to get as much data as possible,” says LaMolinara, “especially around their mouths, foreheads, brows, cheeks, and lips.” Their bodies, however, were hand animated.

“When we needed to attach the tentacles to Alfred [Molina], we had guys with wires all over him to simulate the effect of those legs walking,” says Anthony LaMolinara, director of animation. When the villain was fully CG... “It was like animating five characters,” says LaMolinara. “There’s no reference for that kind of movement. I would say that we hit our stride in showing how much power they had and how much weight they can pick up in a hospital sequence and also when he’s climbing a building.”

For *Spider-Man*, Imageworks used the same model and rig created for the first film by Koji Morihiko. “If we were to do a third film, we’d probably use the same setup again,” says Stokdyk. “He sat for nine months watching video of the stunt guy trying new poses and new positions and new actions until he hand sculpted a model that matched.”

Two things changed about Spider-Man’s hand-animated performance. “Doc Ock and his tentacles caused Spider-Man to perform differently,” says LaMolinara. “We had martial arts stunt coordinators that tried to take the fights in one direction, and I had my own ideas. The push and pull between the two resulted in a unique movement. Also, there was a little more wildness on this film, a more energetic camera.”

City Swinger

“This movie starts where the first one left off,” Dykstra says. “When Spider-Man took that final swing at the end of the first film, you felt you were that character. You sensed his joy and excitement. That’s where the visual effects had to pick up for the second movie.”

Dykstra used a combination of real and virtual camera moves to follow Spider-Man or look through his eyes as he swings through real and virtual environments. Sometimes Spider-Man is actor Tobey Maguire, sometimes a stunt double, sometimes a digital double. “I think the audience will feel what it’s like to actually be in those upper climbs in New York City in freefall and in flight,” says Dykstra. “I want to give people a real sense of vertigo, that feeling when you’re up really high and you approach the edge and your human instincts tell you not to trust your own balance.”



CG tentacles attached to Alfred Molina, who plays the villainous Doc Ock, attack a live-action Spider-Man.

Using a computer-controlled cable rig called, fittingly, a SpyderCam, Dykstra sent a camera speeding up Wall Street for nearly three-quarters of a mile, zooming 25 stories high, sliding to the ground and climbing back up. “Then, Spider-Man would be added,” Dykstra says. “Sometimes we used his point of view, sometimes we put him into the shot, and sometimes we used a virtual city. The magic is figuring out how to capture the 3D world in a 2D medium in a way that gives viewers a sense of reality.”

Effects lead Dan Abrams worked on that final shot of Spider-Man swinging on a flag pole for the first film. “I left the show with new ideas about how to make the buildings more photoreal yet allow Sam [Raimi] to make changes at the last minute,” he says. “On the first show, we did a lot of instancing of buildings [see “Nitty Gritty Spider,” June 2002, pg. 34]. On this show, it was more like Lego city. I treated the buildings more like characters, individualized and fleshed out, and put them through the pipeline.”

As a result, Spider-Man and Doc Ock could get closer to the buildings. In fact, to make one building easier to destroy during a fight sequence, every brick was modeled. “One of the main differences between the first and second film was in how the characters interact with the environments,” says Francisco de Jesus, digital effects supervisor. “In the first film, the villain was on a hoverboard. In this film, the villain is terrestrial, so they fight on the street, on the side of a building, on a train. He’s like a bull in a china shop; as he climbs the sides of buildings, he breaks bricks and windows.”

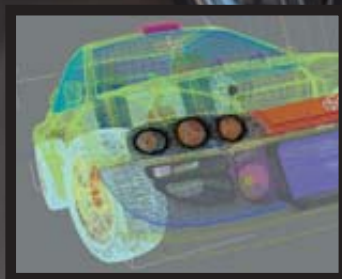
Most of the work went into buildings that we see in passing, however, which presented particular problems. “We learned there are huge issues with legibility when Spider-Man streaks past at 100 miles per hour,” says Abrams. “If the buildings don’t have interesting details, they look plastic. We had to learn how to use textures, geometry, and shader controls to make them legible.”

Digital City

Using Maya models and photographs of skyscrapers, painters working in Adobe’s Photoshop and Alias’s Studio Paint added paint and grunge to the buildings. “It isn’t as easy as it sounds,”

HARDWARE RAYTRACING

FREE
Download



supports:
3ds max



for more information:
www.artvps.com



infoNOW 13 at www.onlinecenter.to/cgw

..... Film

says Abrams. “We weren’t just painting bricks; we had graffiti on the backs of buildings.”

All told, the team created 30 buildings that, when duplicated and rearranged in various ways, produced streets and city blocks with as many as 150 buildings. “Doing the layout was like working with one of those plastic puzzles with one piece missing,” Abrams says, describing how layout artists would slide buildings to create street scenes.

For interiors—the little scenes you see inside a window—Abrams improved on the shaders used for the first film. “I took fisheye photos of various properties under construction, apartments and so on,” he says, “and from those photos created images for walls, floors, and ceilings. The shader constructs a 3D room in shader space and textures it. It’s never built in geometry; only projected at render time.” The technique allowed the team to change the lights in the interior to match exterior lighting.

Although for some shots, the instanced foreground buildings used for the first film were re-used for the middle ground in *Spider-Man 2*, often the camera moves made that impossible. “There’s a sequence with an out-of-control elevated train moving at 100 miles per hour,” says Abrams. “So even in a 100-frame shot, the buildings in the distance are in the foreground in seconds. We didn’t have a single lock-off shot. Spider-Man moves so fast that everything you see in the distance at the beginning of a shot is in front at the end.”

In addition to high-res skyscrapers with mix-and-match props for building rooftops, the team also built street scenes in 3D. “We

Spider-Man’s model remained largely unchanged, but the buildings received a major facelift from individually detailed and rendered geometry.



toolbox

3-dfx.com www.3-dfx.com/Arrete.htm • infoNOW 104

Adobe www.adobe.com • infoNOW 105

Alias www.alias.com • infoNOW 106

Avid www.avid.com • infoNOW 107

IBM www.ibm.com • infoNOW 108

Mental Images www.mentalimages.com • infoNOW 109

Nvidia www.nvidia.com • infoNOW 110

Pixar www.pixar.com • infoNOW 111

Side Effects Software www.sidefx.com • infoNOW 112

created one city block with streets and intersections that we could duplicate and lay out as a city,” Abrams says. Painted textures that were changed procedurally provided variety as did street props—bicycle racks, tables, a magazine stand, and so forth, all built in 3D.

“We had a whole system of 3D cars and motion-captured 3D people,” says Abrams. “In one sequence with Doc Ock and Spidey on the side of a building, Sam

[Raimi] realized how clearly he could see the digital people and wanted to direct them. Much to our chagrin, they became a story point. In one shot, they’re looking up and pointing; in another, the crowd moves to the side of a street. We went through hell rendering all of them.”

The buildings were modeled using one Maya unit per centimeter, a scale used throughout the film. “The shaders we came up with for the city used ambient occlusion and Mental Ray helped reduce rendering time for that from 40 hours to 15 minutes,” says Abrams. “We created cubes and projected textures on some to substitute for the detailed buildings, but they were too simple to use unless they were far away.” To render these complex scenes, the team sent between 100 and 150 files containing 30 x 30 tiles to different processors and then RenderMan stitched the final image together.

“We wouldn’t have attempted to do many exterior shots of New York City in the daytime as recently as the beginning of the last movie,” says Dykstra. “When we began that film, we didn’t know if the last shot would work or not. We were successful, and doing that provided the foundation for this movie.”

It’s all part of making those great Spider-Man swings through the city look and, more importantly, feel real. “I think the audience will have its appetite sated for being up high and moving fast,” says Dykstra, “and have that vertiginous sense of falling. Those aspects of sensory awareness are what you want to find when you’re doing visual effects.”

Thus, for Dykstra and the crew at Imageworks, “doing better” has meant creating more villainous villains and more stunning stunts—the kind of eye candy you would expect in a comic-book superhero film. But they’ve also tried to go beyond that to generate, through this 2D medium, a fully three-dimensional visceral response from the audience. It’s a big leap. “If it was easy, they’d hire the relatives,” says Dykstra. ■■

Barbara Robertson is a contributing editor of Computer Graphics World and a freelance journalist specializing in computer graphics, visual effects, and animation. She can be reached at BarbaraRR@comcast.net.

SAVE EVERYTHING.

NEW

**THE IOMEGA *REV* DRIVE**

You'll run out of ideas before you run out of storage. With whopping 35GB removable disks, the Iomega REV drive gives you infinite storage capacity. Plus, its durable disks read and write as fast as a hard drive. Create, share, backup and save everything.

saveeverything.cominfoNOW 14 at www.onlinecenter.to/cgw

35GB capacity native, up to 90GB compressed. Compressed capacity assuming 2.6:1 compression with "high" compression on Iomega Automatic Backup Pro software. This capacity may vary since compression is data and software dependent. Copyright © 2004 Iomega Corporation. All rights reserved.

If you could reinvent yourself,

what choices would you make? Would you be tall or short, heavy or thin, outgoing or shy? Or would you become a different species, such as a dog or a cat? In *Second Life*, the massively multiplayer online role-playing game (MMORPG) from Linden Lab, players can be anyone, or anything, they ever wanted to be within this immersive, realistic 3D world.

"*Second Life* is a place where you can completely stretch your imagination and the boundaries of reality by exploring a personal fantasy that is outside the realm of possibility within real life," says Robin Harper, senior vice president of marketing and community development at Linden Lab, which was founded by the former CTO of RealNetworks, a streaming media company. "You can do anything you've dreamed about doing in your 'first' life but can't do or haven't done. In fact, our players often use the terms RL and SL—nomenclature for their real life and second life."

Allowing players to incarnate themselves is a novel concept, even in the fantasy realm of an MMORPG. That's because most MMO titles not only limit the activities and locations of the players, but they also restrict the avatars themselves, requir-

ing subscribers to assume a persona that fits within the theme of a particular title, such as the medieval realm of *Dark Age of Camelot*. In contrast, the inhabitants of *Second Life* are free to be and do whatever they want inside. That's because the game is shaped entirely by its users—from the avatars and environments to the "events" hosted by the users. People come to create, compete, explore, and socialize, notes Harper.

"Everything in the world is made by the users, or residents, in real time," says Cory Ondrejka, vice president of product development. "All the content is streamed in real time over a broadband connection, so it allows people to work collaboratively. For

instance, two users can build a house together—one can construct the east wing and the other the west wing, and simultaneously see what each is doing. They can even place a blueprint on a billboard, and refer to it during construction."

A New Beginning

Linden Lab generated the game's initial terrain using procedural textures and hand-drawn surfaces created with Alias's Maya and Adobe's Photoshop, respectively. The company also built the tropical island area, where newcomers learn game basics, and some objects in the start section. (Mac or PC users can log on to www.secondlife.com for a free seven-day trial. Residency requires a onetime fee of \$9.95, plus a monthly or yearly subscription rate. No software purchase or install CD is required.)

Before visiting the island, however, players must create an avatar by choosing between a male or a female model, which also has been pre-built by the developer in Maya. Then, players adjust their model by using approximately 200 available sliders, which alter everything from the avatar's girth and height to its facial detail. In fact, an avatar can be altered to a point where the character is no longer a human.

In the online

game *Second Life*, players can choose a new virtual existence

By Karen Moltenbrey

LIFE OR SOMETHING LIKE IT



The remainder of the world content is built by players using a proprietary solids-based construction system consisting of a box, sphere, torus, and other primitives that can be scaled, hollowed, twisted, and distorted to make various shapes. Users also can combine the basic shapes to create far more complicated objects. “We haven’t found a shape that can’t be built fairly easily,” Ondrejka says. Moreover, the primitives are easily compressed, making the data-streaming process faster for the user.

“Just like in real life, some people are good fashion designers and can make fabulous clothing,” says Harper. “Someone made a wedding dress with layers and layers of delicate-looking cloth, which gave it an ethereal look.” For those players possessing particular skills such as this, there is an in-world economy that allows them to set up shop and sell their wares to other players who may neither want to take the time nor possess the skills to make the clothing themselves. However, for those players who do, they can even upload textures into the game to make their own unique clothing.

Aside from augmenting their avatars, players also use the modeling system to build just about anything—houses, concert venues, bridges, retail outlets, helicop-

ters, bridges, hot tubs, pet shops, cars, and motorcycles—all of which can be scripted through an embedded language similar to C code. “Some of our more prolific scripters never wrote code before,” notes Ondrejka. “It looks imposing at first, but the world is full of sample scripts, and you can’t break anything. You just tweak the code and see what happens, then continue.”

One industrious player even made a spaceship that flies around the world and occasionally hovers above an avatar before emitting a blue tracker beam that traps a character and beams it aboard. “The space avatars are dressed as aliens and use funny probes on the subjects before dropping off the victims in various parts of the world,” says Harper. “Then they give the avatar a T-shirt that says ‘I was abducted by aliens and all I got was this lousy T-shirt.’ Now, the spaceship is legendary, and at one point avatars were standing around hoping to be abducted.”

In Second Life, players use the game’s proprietary solids-based modeling system to create unique identities (below).

With the same modeling system, they can construct businesses, such as discos (top right), or houses (second from top), complete with furnishings (right).



••••• Web

Recently, Linden Labs added support for complex character development and enhanced motion, enabling players to animate their avatars to do just about anything. Using an open .bvh file format supported by software such as Curious Labs' Poser, players can create and upload animation files, endowing the avatars with distinct moods and movement—creating, for instance, guitar-strumming rock stars to world-class swimmers. To date, users have staged realistic boxing matches, re-created action sequences from feature films, and choreographed elaborate dance routines.

To encourage creativity, Linden Labs now grants the ownership of in-world content to the subscribers who make it, revising its terms of service so users retain full intellectual property protection for the digital material they create, including the characters, clothing, scripts, textures, objects, and designs.

Building Fee

When the game launched last year, it contained a general store, a disco, and other attractions. Since then, ambitious residents have added a plethora of content, including an amusement park with more than 30 rides and “themed” towns (such as an Americana village and an anime area). These and other regions can be enhanced with streaming audio clips for ambient theme sounds. In a recent development, residents can now link to Internet audio sources broadcasting live sportscasts, talk shows, and DJ soundtracks directly from real-world clubs to *Second Life* clubs, for example.

One player even hosted the first known Virtual Book Club event, featuring science-fiction writer Cory Doctorow, that was attended by a number of avatars who lounged on couches and chairs as they discussed the writer's recent novel. “Since the game's introduction, residents have built businesses, designed wild vehicles, and introduced adventure games, all within the digital world,” says founder Philip Rosendale (see “Fantasy World,” pg. 80).

Users are now free to build as many venues and objects as they want in *Second Life*, as long as they stay within the object allocation limit for the land they own, whereas before, they were taxed on each object that remained in the world. “This discourages people from overbuilding,” says Ondrejka. “Yet it encourages players to experiment and allows them to grow with the system by starting with something small, like a house, until they build up enough in-game currency or real money to buy more land and attempt something larger.” Recently, users were given the ability to purchase virtual private islands, which allows them to alter the terrain and even determine who can visit the area.

All residents earn weekly grants of in-world currency. In addition, they can earn bonuses, depending on several factors such as their rating on a leader board. So if others rate them positively because of their likability or the look of their avatar or home, then those players earn more in-world dollars—a system that encourages positive behavior. Residents also can earn virtual incomes by setting up shop and selling various wares. One person created a pet store where residents can purchase dogs and even buy “training” (scripted behavior) for them. Another built a night-



The skills people bring to the game are not artificial, like they are in other MMORPGs, but are based on real abilities to create models and script behaviors, including those for a spaceship (top) that abducts “victims,” trained pets (middle), and fast cycles (bottom).

club and added a bouncer to take virtual dollars from people wanting to enter.

“Unfortunately, we never know what objects will be in the game at any given time,” says Ondrejka. “An amazing building can disappear overnight. As a result, the world is constantly changing.”

Indeed, content creation is a large part of the game, but some players forego that option and instead just walk around the virtual space and chat with other inhabitants or attend events, including scripting classes, quiz shows, sporting events, theatrical productions, and more.

“Because it is so different from the typical MMORPG,” Harper notes, “some of our players won't even call it a game.” ■■

Karen Moltenbrey is a senior technical editor at Computer Graphics World.

VXRACK

THE MOST POWERFUL CLUSTER EVER

**YOUR BUSINESS
CHALLENGES ARE REAL.
YOUR SERVER SHOULD BE, TOO.**

Give the software that keeps your business running the power to get the job done right with **Ciara VXRACK** cluster based on the **Intel® Xeon™** processor.



VXRACK™ - 256 Intel® Xeon™ - 3.06GHz

One Single Rack

1.56TFIps Max Performance

128 Computing Nodes

256 Intel® Xeon™ Processor 3.06GHz

2GB ECC/DDR High Performance per node

40GB HDD ATA 100 per node

1 PCI-X Slot per node

Dual Gigabit Port per node

8 Gigabit Switches 24 ports (layer 2,3 &4)

All Cables, PDU and Rack Accessories



\$299,950*

\$269,950*

VXRACK™ - 128 Intel® Pentium® 4 - 3.2GHz

One Single Rack

819GFIps Max Performance

128 Computing Nodes 800MHz FSB

128 Intel® Pentium® 4 Processor

(3.2GHz-1MB L2 cache)

1GB ECC/DDR High Performance per node

40GB HDD ATA 100 per node

1 PCI Slot per node

Ethernet Port 10/100 + 10/100/1000

8 Gigabit Switches 24 ports (layer 2,3 &4)

All Cables, PDU and Rack Accessories



\$149,850*

VXCUBE™ - 32 Intel® Itanium® 2 - 1.4GHz

One VXCUBE

16 Computing Nodes

32 Intel® Itanium® 2 Processor

(Special HPC - 1.4GHz, 3MB Cache)

4GB ECC/DDR PC266 per node

40GB HDD ATA 100 per node

1 PCI-X slot per node

Dual Gigabit Port per node

1 Gigabit Switches 24 ports

Integrated Power Distribution Unit



\$5,350*
per node

Visit us at **SIGGRAPH 2004** Booth 2047

**CALL TODAY 866-7VX-RACK
WWW.VXRACK.COM**

infoNOW 15 at www.onlinecenter.to/cgw



Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, Pentium, and Pentium II Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
*Important Information: All prices, specifications and promotional offers are subject to change without notice. Cases cannot be responsible for typographic errors, photographic errors, pricing errors. All pricing in US dollar. Shipping and applicable taxes are not included.

.... Video

Digital elements add
drama to a NASCAR
television commercial

Drive Time

By Karen Moltenbrey

The CG artists at visual effects boutique Kroma were sitting in the driver's seat while creating three compelling, action-oriented TV commercials for FOX television's NASCAR coverage.

To illustrate just how tough the sport's drivers are, the tongue-in-cheek spots feature famous racecar drivers talking about the dangers athletes in other sports face while they nonchalantly pilot their cars

and other digital enhancements, using Softimage's XSI content-creation software, and replaced the greenscreen backgrounds with composited views of the racetrack. In the process, they created a number of details, including a CG visor on the helmet Stewart wore during the shoot. "If you look closely, you can see moving reflections of the track in the visor," notes visual effects supervisor Bert Yukich. "We also added a few hairline scratches to the surface as well, for realism."

For the FOX TV ad, driver Tony Stewart was filmed against greenscreen in a mechanical car rig (left). Later, CG artists incorporated 3D safety gear and reflections, and added a composited racetrack backdrop.



through the mayhem of a NASCAR event. In "Rear-Ended," for instance, driver Tony Stewart states how worried he is about football players and the hits they take—just as his car is struck from behind and spins out of control, and a tire rolls from the vehicle toward the camera.

For the interior scenes of the spot, Stewart was filmed against greenscreen inside a mechanical rig set up to simulate the movement of a car. During postproduction, Kroma's "driving team" integrated those elements with live-action footage and CG effects to make it appear as if Stewart were inside an actual car.

The artists also added CG safety gear



For the exterior scenes, director Joseph Kahn from HSI filmed a dozen cars moving around an oval track. Then, Kroma supplemented the real vehicles in post with CG models to create a highly choreographed, tight pack of 30 to 40 cars typical of NASCAR events. To achieve the correct look and motion for the models, the group reviewed hours of actual racing footage provided by FOX.

Yukich also attended the location shoot, gathering reference materials that enabled the group to seamlessly inte-

grate the computer-generated cars into the real environment.

For example, he says, "We shot a number of stills, and gathered [high-dynamic range] lighting data that allowed us to replicate the lighting conditions at the track and apply those to the CG cars."

To enhance the scene, the artists also added smoke and debris to the track environment, as well as the tire that flies off the car, using an Avid|DS editing system.

For one of the more challenging effects, the team included a shot in which the camera moves from an exterior view of the cars whizzing around the track to the interior of Stewart's car. To accomplish this, the artists created an artificial camera move that bridges the two shots and, at the transition point, substituted a CG model for the real racetrack.

As is often the case with realistic visual effects, it's the little things that establish the illusion. For in-

stance, the group added film grain for a live-action look, and introduced camera shake to the shots of the driver to simulate the shimmy effect resulting from a car traveling at top speed.

Recently, Kroma received a Clio Award for the visual effects in "Rear-Ended," earning the boutique a victory lap in the race for innovative digital effects in television commercials. ■

Karen Moltenbrey is a senior technical editor at Computer Graphics World.

3D scanning...

...for Complex Objects



DESKTOP 3D SCANNER

High resolution, compact:
Sculptures
Models
Bones



HIREZ MINI MODEL SHOP COLOR 3D SCANNER

High resolution, mid-size models:
Design
Prototypes
Reverse Engineering



MODEL SHOP COLOR 3D SCANNER

Standard resolution, large models:
Large sculpture
Maquettes
Industrial Models

...for Human Subjects



HEAD AND FACE COLOR 3D SCANNER

Standard resolution, composite human face or head:
Animation
Engineering
Design
Virtual Reality



WHOLE BODY SCANNERS (WB4 & WBX)

Full resolution, whole body scanning:
Animation
Fashion
Ergonomics

**Whatever You're Scanning,
Cyberware provides an entire line
of 3D scanners that are fast,
accurate, and easy to use.**

CELEBRATING 20 YEARS OF 3D SCANNING!

www.cyberware.com

email: info@cyberware.com

infoNOW 16 at www.onlinecenter.to/cgw

Cyberware®

Portfolio

SIGGRAPH Art Gallery



Clockwise from top left:

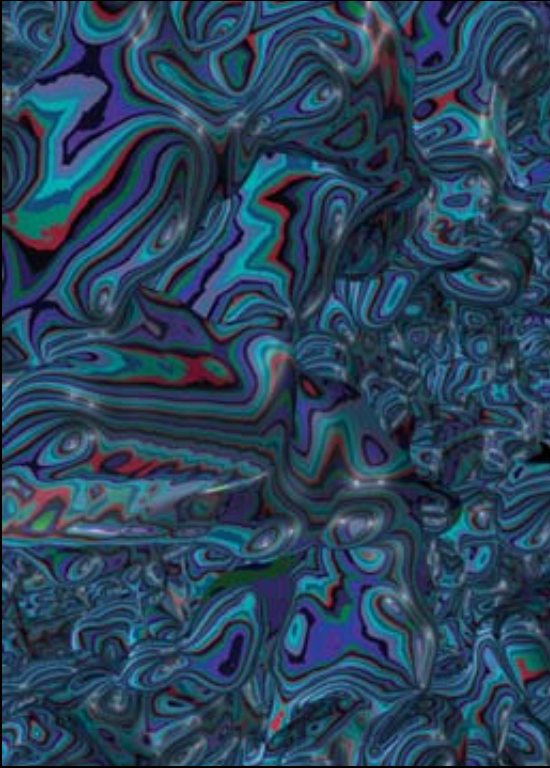
Transmigratory Summation by Kent Oberheu is a giclee print created using Cinema 4D and alpha plug-ins for Cidertank's tool set. The image contains a series of splines generated from a flocking simulation of particles, which were coaxed through space using a "goal" object in real time. The splines were then lofted to create a NURBS surface.

Acrobats by Melissa Harshman is an ink-jet print whose individual objects portray a single, related concept. The acrobats serve as a metaphor for the daily balancing act humans perform each day, while the movie starlets, numerical calculations, and counting marks represent the outward pressure to succeed, and the lotus flower signifies the spiritual drive within. All the components, collected from various sources, were scaled and layered into the collage using Photoshop.

Noise Control by Anna Ursyn is a photographic silk screen that reflects the commonality of the technological and human worlds through the placement of various elements and concepts. This cityscape illustrates how humans affect their environment, which is shown within a city metaphor reflecting the rhythm and organization of large data sets. The image was created using Fortran, and integrates other technologies and techniques, including scanning.

When Sue Gollifer was named chair of the SIGGRAPH 2004 Art Gallery, she was determined to select a title for the gallery that was contemporary and described the theme of this year's exhibits: works that stimulate and explore new connections—technological, aesthetic, and critical—among the senses. She chose Synaesthesia, which, by definition, is an involuntary cross-modal association whereby the stimulation of one sense prompts the stimulation of another sense.

Illustrating this theme, the gallery will feature 2D, 3D, interactive, multimedia, telecommunications, installation-based, and screen-based (online) works that viewers can see, hear, touch, or smell. "I wanted to focus on how artists can excite the senses through a range of technologies," says Gollifer, an artist and principal lecturer of fine art at the University of Brighton in the UK.



The exhibit, on display during the annual ACM SIGGRAPH conference and exhibition, contains more than 150 juried selections from a record number of 850 submissions. The featured works, created by established and novice artists alike, were produced using various techniques, from high-tech 3D computer graphics to low-tech digital plotters. "Our jury of industry professionals looked for interesting, thought-provoking images and installations that reflected a range of work and technologies," says Gollifer of the vetting process.

Gollifer, the first European to chair the SIGGRAPH Art Gallery, has worked to raise the profile of the conference and the gallery throughout Europe. As a result of her efforts, the prestigious Ars Electronica conference, held annually in Linz, Austria, has agreed to display prize-winning exhibits from its 2003 *Continued on page 62*

Clockwise from top left:

CORE-CELL Tower by Yoichiro Kawaguchi comprises as many as 20 reticular images, including this one, which are contained within a light box. Each image is a representation of a single image viewed from slightly different viewpoints and then placed on different faces of a tower. The result is a mixture of spatial effect and false illusion representing artistic impression in 3D photography. The ensuing dizziness, a consequence of viewing the abstract patterns, is intended to amplify the effect of spatial awareness.

Dusk of Shattered Icons by Quintin Gonzalez is a digital print series created in Poser, Painter, and Photoshop that delves into the metamorphosis of the human identity. These guises have been blurred into a transfixed moment that signifies the passage of time.

Red streamlines by Mark Stock is a digital print that investigates the essential character of wavy, rotation-dominated flow in water, air, and other matter. The image contains 1000 streamlines in a fluid-like flow, which were calculated using an algorithm that determined their paths. A central focus of this object is the inter-reflection of light, giving it context.

Poetics of Migration #2 by Phillip George is one image in a series of metallic laser prints, each of which is a composite of multiple layers of imagery collected by the artists during years of traveling around the world.

**Clockwise from top:**

seri_C_D1 by Floyd Gillis is one of 10 prints that echo some of the pen and ink compositions of the late 1970s and '80s whose elements combine to form a dynamic arrangement that not only continues to move on the page, but also reflects the feeling of immersion within the seemingly massive sculptures. The 3D models, scene composition, lighting, and shading elements were created within Houdini, and rendered with Houdini's Mantra.

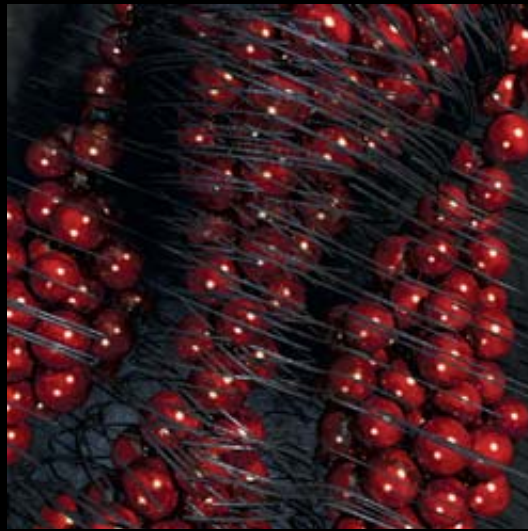
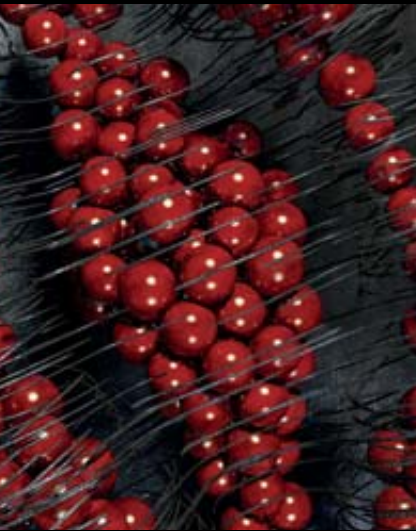
Worley Basin by Dylan Sisson was generated within Pixar's Slim as a single procedural shader and rendered as a shader swatch applied to a flat plane. Each shader contains many layers of simple procedural functions, like Worley and turbulence, that result in simple, non-repeating patterns. These were then sized by manipulating the surface parameterization, mapped to color and layer opacity, and adjusted through other methods. No painting, digital or otherwise, occurred during the process.

Polloi by Philip Sanders comprises a series of ink-jet prints from Koi, an interactive panoramic painting that investigates the relationship between the perceptual, phenomenal, and conceptual worlds. The panorama is a digital synthesis of realistic and abstract imaging from digital painting, video, and photography, and draws on diverse art references, such as abstract expressionism and surrealism.

Continued from page 61 show in the SIGGRAPH Art Gallery, as part of Ars Electronica's 25th anniversary celebration.

Moreover, this year's gallery, in collaboration with the SIGGRAPH 2004 Computer Animation Festival, Emerging Technologies, Sketches, and Web Graphics, will provide artists with a wider forum to exhibit and discuss their work. In addition to displaying the numerous art pieces, the gallery will show 18 experimental and art/design animations that are part of the "umbrella" Computer Animation Festival. Submitted by the festival chair, these animations similarly reflect the gallery's Synaesthesia theme. Two of the animations will be featured in the Animation Festival as well.

Also presented in the gallery will be six critical art essays: "The Kitchen as a Graphical User Interface" by research assistant Leon-



ardo Bonanni of MIT; "Sensational Technologies" by Annet Dekker of The Netherlands Media Art; "Studies in Audio/Visual Digital Art" by Ernest Edmonds of the University of Technology, Sydney; "Interface as Image: Image Making and Mixed Reality" by Ian Gwilt of the University of Technology, Sydney; "The Noetic Connection: Synesthesia, Psychedelics, and Language" by Diana Slattery of Rensselaer Polytechnic Institute; and "Thoughts on Hesse, Digital Art and Visual Music" by Bruce Wands of the School of Visual Arts.

Adding to these gallery offerings will be three artist roundtable discussions, scheduled during the conference. The Art Gallery will be open to show attendees Sunday, August 8, through Thursday, August 12.

A sampling of the works from the gallery is shown on these four pages. —Karen Moltenbrey

Clockwise from top left:

2003.4a and 2003.4b by Kenneth A. Huff represent a series of digital images on color photographic paper that were inspired by forms and patterns that appear in nature. The images were generated in Maya and custom software. The final renderings were completed in a single pass with no compositing.

Solar Self Portrait by Jeffrey Guhde is a solar self-portrait print made by a microcontroller that uses a computer program to detect the light from the sun, which in turn controls drive motors on a stylus that moves along the ground to produce a chalk outline between the light and shadow.

geo_04 by Keith Brown is a rapid-prototype sculpture that embraces a range of digital activities, both virtual and actual. Designed in 3ds max and output using a subtractive method, the resulting object represents a sculptural form that could not be realized except within a digital environment.

Yellow Boat by Peter Hardie is a computer-generated print created in Softimage, with Photoshop used to paint the reflective sky. The work focuses on a yellow boat on a river at a point where the interplay among the ripples, caustics from the water, and reflections of the boat and sky result in a rich, interactive composition.

WORKSTATION

Alienware MJ-12

Alienware's workstation excels for content creators

By George Maestri

Alienware has been dominating the high-end gaming market for some time now. Hip gamers who need really fast machines have been turning to Alienware systems for both speed and good looks. Whereas playing high-end games has been Alienware's forte, they've moved to the other side of the equation by producing a series of workstations designed for artists who create games, movies, and other high-end graphics applications. Its new MJ-12 workstation is a terrific tool for artists and content creation professionals alike.

An Alienware system is certainly not the generic black box that you tuck under a desk. Alienware's MJ-12 case looks like it was pulled straight off the set of a *Buck Rogers* movie: a curvy black and silver shell complete with cooling fins and a small alien hood ornament on the front. The full-size tower sports a case with a hefty 550-watt power supply and sufficient room for oodles of expansion.

The workstation is large, so it probably won't fit on your desktop. It also is not the quietest machine I've used. Some of the reason is perhaps due to the extra cooling requirements of its high-end processors and multi-disk array. It wasn't so noisy as to be bothersome, but I would opt to tuck it under or alongside a desk.

The back of the machine has the requisite keyboard, mouse, parallel, and serial ports, as well as two USB and two Gigabit Ethernet ports. Audio is provided by a SoundBlaster Audigy 2 card, which pro-

vides surround sound and a FireWire port. The front of the machine has four additional USB ports. Opening the front panel reveals CD-ROM and floppy drives, a DVD burner, and two 5-inch bays.

A hidden lever toward the back of the box helps pop off the side panel, opening up the workstation. The side panel also was held on with some Phillips screws. While the screws provide an extra degree of security, it looks as though the side can stay on quite firmly without them. I would only install them when shipping the unit. Once inside, I noticed that the guts of this box are beautiful. Every cable is properly routed and tied down for neatness and maximum airflow. The motherboard contains one AGP, two 32-bit PCI, one 64-bit PCI, and one 64-bit PCI-X slot. Easy to remove and service, the disk drives can be either standard ATA or Serial ATA, allowing for ultra-fast drives and RAID arrays.

The configuration I used included dual 3.06GHz Xeon processors on a Supermicro XSDAL-TG2 motherboard. The motherboard supports up to 8GB of ECC RAM. The dual Xeons provide excellent integer and floating-point performance, but are 32-bit processors. Comparing them to the dual 64-bit Opteron machine I reviewed last month gives us some interesting numbers. A quick Sandra test put CPU performance at 18994 Mips integer and 12970 Mflops, putting its integer performance on par with an Opteron and slightly ahead in floating point. Memory performance was clocked at 2402MB/second, which is understandably about half that of the Opteron, which has a data path twice as wide as the 32-bit Xeon.

This particular workstation was configured with four very fast Serial ATA drives tied together in a RAID array. Serial



Eye-catching and powerful, the Alienware MJ-12 workstation is well-suited to creative work flows.

ATA drives have the speed of SCSI but are more cost effective. A disk performance benchmark measured throughput at a whopping 85MB/sec, fast enough for any high-end video or film application.

As for graphics, the MJ-12 sported an Nvidia Quadro FX 1100 graphics card, which is cost-effective and one of the faster solutions on the market. Graphics performance was very good. Subjected to Viewperf 7.1, it earned a 3ds max score of 25.12, a Pro/E score of 35.05, and a UGS-03 score of 34.79. These numbers, while not at the top of the heap, are excellent. Those needing even more power can always upgrade to the Nvidia Quadro FX 3000 or 4000.

Of course, benchmarks are only part of the story. I tested the machine with a number of applications, including Discreet's 3ds max and Adobe's After Effects and Photoshop. Application performance was very good, and I had no serious issues with any of the packages. And, as far as games, it earns a big thumb's up. Resolution and playback speed were excellent, and again I experienced no compatibility issues.

Overall, I really like this workstation. Although the case may prove a little large for most people, the system is solidly built with high-quality components. The machine was not only fast, but also attractive and easy to maintain. Anyone working in the high-end content creation field would love the Alienware MJ-12. ■

George Maestri is president of Rubberbug, a Los Angeles-based animation studio specializing in character animation.

AlienWare MJ-12

Price: Starting at \$2126
(\$7324 as configured)

Minimum System Requirements:
Not applicable

Alienware
www.alienware.com
infoNOW 113

attitude and understanding:

a compositing community
forged from the depths of
forward thinking.

Digital Fusion



CAFE FX

www.eyeononline.com

Gothika Image Courtesy CAFE FX
Copyright Dark Castle Productions

Copyright © 1988-2004 eyeon Software Inc. All rights are reserved.
eyeon Digital Fusion, Digital Fusion and DFX+ are registered trademarks of eyeon Software Inc.
All trademarks, company names and products are the property of their respective holders.

eyeon

Recent DF productions include Gothika, Master and Commander, The Last Samurai, Matrix Revolutions, Paycheck and Les Triplettes de Belleville.

Visit eyeon at Siggraph 2004 - Booth #1429

infoNOW 17 at www.onlinecenter.to/cgw

ANIMATION

Poser 5

Curious Labs' upgrade

By Frank McMahon

Poser has come a long way. I remember the first version and its unique ability to create and render human figures quickly. When an update added animation, it was clear that the tool would generate a following. And it did. The only problem was that, at the time (I'm talking circa Poser 2), the images had a distinctive look. If you saw an image, you could essentially tell that it came from Poser. Fast forward to 2004 and Poser is all grown up. Poser has matured into a top-level, professional tool offering the ability to create original and stunning character animation at a very reasonable price.

Perhaps the most important new feature is the FireFly rendering engine. Early versions had chunky rendering; you had to touch up quite a bit in Adobe Photoshop to approach photorealistic quality and correct slight rendering inaccuracies. Not anymore: output is stunning with polygon-smoothing, displacement mapping, depth-of-field options, procedural textures, 3D motion blur, and raytraced refractions and reflections. Poser 5 offers two main rendering modes, draft and production, and scores of parameters. Draft, what you will work in mainly when creating, renders speedily and provides nice final output. Production mode takes longer to render, but you can add reflections, textures, depth of field, and raytracing for the ultimate in realism.

New elements in the rendering engine

are node-based shaders. We have all seen various texture generators, with racks of parameters that can be altered to create new hues and materials. Now, imagine that these generators can be hooked to each other, stacked, and mixed, and you'll get a sense of the wealth of options that can be exercised. One node output can affect another node input for unlimited possibilities. After you have hooked up many nodes to create a new texture, you can save it as a preset. The program ships with more than 100 materials in the areas of 2D and 3D textures, lighting, environmental maps, and raytracing. Get ready to get lost for days in creating new textures that have never before been seen, or rendered.

With the new Custom Faces feature, you can photograph yourself from two angles, import it into the Poser 5 Face Room, and build a 3D head that looks just like you. After you build your new 3D likeness, you can use face-shaping tools to tweak yourself to perfection. Just point, click, and drag to alter your eyes, ears, or nose. You can change your brow ridge, cheekbones, chin, forehead, jaw, mouth, temples, ethnicity, age, gender, and more via parameter sliders. No longer do you have to go with standard pre-designed 3D models; you can easily point, click, and shape a new, unique person.

After your face is done you can add strand-based hair. Poser 5 aids you in growing hair onto models easily, offering various presets and options for tweaking color, thickness, length, root width, clumpiness, and kink, as

examples. Virtually any type of hair you can imagine can be created. Because Version 5 includes gravity and collision detection, you can set wind to blow your new hair and make it sway and swish.

Other new features include a powerful scripting engine called Python for directly tapping the programs features. Dynamic cloth that realistically sways in any breeze that you add via the new wind force field. Improved content management, new props and bodies, the ability to export to Macromedia Flash, and an enhanced user interface with pop-up Help round out the upgrade. I also loved the Content Room, where I could link to an online store from which to download characters and props.

Poser 5 only became bogged down occasionally when complexities, such as detailed hair, needed to be rendered. I worked primarily in draft mode, and rendering was nice and fast. If you purchase Poser 5, check for the latest download update at Curious Labs' Web site. A powerful program with excellent rendered results, Poser 5 offers not only high-end character animation tools, but also an environment in which you can grow professionally. ■■

Frank McMahon (www.fmstudio.com) is a graphics professional with more than 15 years' experience testing high-end software and hardware tools for the creative community.



It is easy to alter a 3D head in Poser 5. To create long ears, I simply pulled on them with the mouse. The new materials section, in the center of the screen, features texture nodes that can be linked together for millions of creative possibilities.

Poser 5

Price: \$319

Minimum System Requirements:

English versions of Windows 98se, 2000, ME, or XP with a 500MHz Pentium class or compatible processor and 128MB of system RAM or Mac OS 10.2 or later with a 500MHz G3 processor and 256MB of system RAM; a 24-bit color display with 1024x768 resolution; 500MB of free hard disk space; and an Internet connection for Content Paradise.

Curious Labs
www.curiouslabs.com
infoNOW 114

*Learn the fundamentals of
3ds max®, Maya® or combustion®
in 4 days for \$495.*



The biggest investment in a new software package is your time. Oregon3D will help you make the most of your time in our kick-ass training center. Our expert instructors are focused on teaching why, when and how to do something as opposed to just running students through tutorial after tutorial. Check us out...

Space is limited so register today at www.oregon3d.com.

Or call toll free: 866.626.9100

Oregon3D, the Mobius image, and The Academy for Digital Arts and Sciences are registered service or service marks of Oregon3D, Inc. All other trademarks belong to their respective holders. Please excuse the "kick-ass," we're just really excited about providing this offer.

infoNOW 18 at www.onlinecenter.to/cgw



**The Academy for
Digital Arts & Sciences™**



is looking for super-short animations
in the 15-20 seconds range!



YOUR
BIG
CHANCE
TO GET

s m a l l

Enter the World's Smallest Animation Festival contest and you could see your work appear on mobile phones. With 1.3 billion mobile phones in use now, that's a lot of play for your art! Plus, you could win **exciting prizes**. The winner will be announced at SIGGRAPH in August at our booth #1455. The WSAF contest is brought to you by:

As a courtesy to the creative community there is **no entry fee** for the competition. The finalists will be displayed and the winners will be announced at **SIGGRAPH 2004**.



bigDIGIT

www.bigdigit.com



ComputerGraphics
World
The Magazine for Digital Content Professionals

SIGGRAPH2004



The World's Premier Conference on Computer Graphics and Interactive Techniques

conference

8-12 AUGUST 2004

exhibition

10-12 AUGUST 2004

ADVANCE PREVIEW

Los Angeles, California USA
www.siggraph.org/s2004



Sponsored by ACM SIGGRAPH

LIGHTWAVE- THE CHOICE OF AWARD WINNING ARTISTS



Photo © Area 51

“LightWave offers the speed, capability and flexibility that allows us to provide the pristine visuals our clients need when they need them. Our artists can work quickly and yet flex their imaginative muscles, with a tool designed to work the way they need to work. LightWave has a great modeler, a great renderer, and a perfect virtual stage designed from the ground up for the filmmaker.”

— Tim McHugh, Area 51,
2003 Emmy® Award Winner for
Outstanding Visual Effects for a
Miniseries, Movie or a Special

For more information about Emmy award
winning LightWave 3D®, please call
800.843.8934, or visit www.newtek.com.
infoNOW 34 at www.onlinecenter.to/cgw



LightWave and LightWave 3D are registered trademarks of NewTek. Emmy is a registered trademark of the Academy of Television Arts and Sciences. NewTek is the proud recipient of the 2003 Primetime Emmy Award for Engineering for LightWave 3D.



DongSool Shin; Daejeon, South Korea; *White 1*, 2003

Visit us at
SIGGRAPH
Booth 1529



Savannah College of Art and Design

An International University for the Arts

Advertising Design · **Animation** · Architectural History · Architecture · Art History · **Broadcast Design**
Fashion · Fibers · **Film and Television** · Furniture Design · Graphic Design · Historic Preservation · Illustration
Industrial Design · **Interactive Design and Game Development** · Interior Design · Media and Performing Arts
Metals and Jewelry · Painting · Photography · Sequential Art · **Sound Design** · **Visual Effects**

Bachelor of Fine Arts · **Master of Architecture** · **Master of Arts** · **Master of Fine Arts**

Savannah, Georgia · 800.869.7223 · www.scad.edu

infoNOW 35 at www.onlinecenter.to/cgw

Register Online for SIGGRAPH 2004

The advance late registration deadline is Wednesday, 21 July.
Act now and register online at:

www.siggraph.org/s2004/registration

On-site Registration

Please go to the on-site registration area in the Los Angeles Convention Center.

Registration Hours

Saturday, 7 August	6 - 8 pm
Sunday, 8 August	8 am - 6:30 pm
Monday, 9 August	8 am - 6:30 pm
Tuesday, 10 August	8 am - 6:30 pm
Wednesday, 11 August	8 am - 6:30 pm
Thursday, 12 August	8 am - 3 pm

Hotel Reservations

SIGGRAPH 2004 Housing
+1.847.282.2529
siggraph@itsmeetings.com

For more information, contact:
SIGGRAPH 2004 Registration Management
+1.703.449.6418
+1.703.631.6288 fax
registration@siggraph.org

www.siggraph.org/s2004

View from the Top

A conversation with Dena Slothower, Chair of SIGGRAPH 2004.

Interview conducted by Phil LoPiccolo, Editor-in-Chief, *Computer Graphics World*

Q. What are the main themes of the SIGGRAPH 2004 conference?

One of the most striking aspects of this year's content is the incredible diversity of uses for the technical advances in computer graphics and interactive techniques. Researchers are looking at areas ranging from perception to geoinformatics to preserving cultural heritage. This broad range of applications for research creates new problems and new challenges. Perhaps it is the reason why submissions to several of our technical programs continues to increase, this year at rates of 10 to 25 percent.

We are also seeing a stunning breadth in the submissions to areas such as the Art Gallery and the Computer Animation Festival. The accessibility of advanced technologies is making it possible for more and more people to realize their personal visions. The pool of creators of these animations, images, and experiences represents a wider range of professional and educational institutions and includes a greater number of international artists. For example, the SIGGRAPH 2004 Art Gallery: Synaesthesia received nearly 1000 submissions from dozens of countries, and the Computer Animation Festival jury selected a student piece from Australia for one of our two Festival awards.

Q. What technological advances do you think stand out this year?

Programming on GPUs is definitely a hot topic this year. There's a course on "General-Purpose Computation on Graphics Hardware," Papers on "Large Meshes and GPU Programming," Sketches on topics such as GPU1 and GPU 2, an Exhibitor Workshop on the topic of "Faster GPU Computations Using Adaptive Refinement," and a co-located conference on "General-Purpose Computing on Graphics Processors."

Another area coming into its own at SIGGRAPH 2004 is display technologies. Some examples include 3D TV—a system for real-time acquisition, transmission, and 3D display of high-definition, dynamic content—

and High-Dynamic Range Display, a project which addresses the brightness, contrast, and color accuracy needs for applications such as film editing, medical imaging, and satellite imagery. I am particularly pleased to see that a number of these projects are exhibiting in our Emerging Technologies venue. You will really need to experience them to understand their potential, because they are pushing past the boundaries of what is possible with our current display technologies.

Q. What new applications of graphics technology are emerging?

From year to year, SIGGRAPH has always been the place to see how advances in computer graphics expand the narrative possibilities of film, TV, and games. This year, the Computer Animation Festival includes a wide range of artistry from *The Parthenon* to *Shrek 2*. And I know attendees will be interested to hear about the inner workings of the production of *Van Helsing* and *Everquest II*, to name just a few of the talks in the Sketches program.

A great deal of interesting work is being done in interactive techniques, particularly for image manipulation and geometric modeling. This is evident in both the Papers and Sketches sessions.

Q. How will such new applications affect the lives of end users?

The theme of this year's Emerging Technologies venue, about enhancing everyday life, is actually quite descriptive of the conference theme at large. The pervasiveness of these technologies in our everyday lives affects the developer, the end-user, and ultimately, the shape of our professional (and sometimes personal) reality.

The new standards explored by the developers and designers in our Web Graphics program will potentially find their way onto everyone's desktop or handheld device as they surf the Web or use other types of network applications. Projects from this year's Emerging Technologies venue, like CirculaFloor, a locomotion interface, which allows the user to remain stationary



while walking in a virtual environment, and Lumisight Table, an interactive, view-dependent display table, are examples of how we might work, play, and learn in the near future.

Our keynote speaker, science-fiction author Bruce Sterling, will be addressing some of these issues in his address, "When Blobjects Rule the Earth." Personally, this is one of the sessions I'm most excited about.

Q. What else are you most looking forward to at the conference?

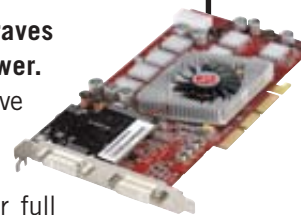
The return of Panels to the SIGGRAPH conference is a definite highlight for me. We have selected seven panel topics for SIGGRAPH 2004, at which experts will debate such topics as "Next-Generation User Interface Technology for Consumer Electronics," "Custom Software Development in Post-Production," and "Games Development: How Will You Feed the Next Generation of Hardware?" Attendees, as well as the panelists, will have some divergent views on the paradigms and the present and future states in these areas. I am looking forward to the conversations that will unfold at the conference as a result of these sessions.

Another area that we expect will generate a great deal of interest is our new Posters program. For this, we encouraged the submission of nascent research as well as incremental—but noteworthy—research results, to help us see even further into the future of graphics and interactive techniques. This program will show us the new paths people are taking and will provide fruitful topics for conversation. A Posters program is a natural fit for a conference that is all about what can be accomplished when attendees have the opportunity to freely exchange information face-to-face. And these ideas, when shared, spark the community to achieve even greater technical and creative breakthroughs.

The Power Behind the Pixel

Everybody craves graphics power.

ATI's innovative graphics technology delivers it. Our full range of industry-leading FireGL™ workstation accelerators boosts your productivity on digital content creation, CAD and visual simulation projects, empowering you to meet creative challenges for titles such as Half-Life® 2. From mobile workstations to high-end visualization systems, FireGL solutions provide 3D professionals with unrivaled performance and reliability, at prices that fit every budget.



Optimized for OpenGL® and Microsoft® DirectX® 9.0 applications, and backed by a dedicated technical support team, the FireGL series offers full certification for the leading CAD, AEC, and DCC applications including SOFTIMAGE® XSI, the software used by Valve® in the creation of Half-Life® 2.

The Power Behind Digital Content Creation



infoNOW 36 at www.onlinecenter.to/cgw
Visit ati.com/FireGL

VALVE
SOFTIMAGE

Copyright 2003, ATI Technologies Inc. All rights reserved. ATI and FIREGL are trademarks and/or registered trademarks of ATI Technologies Inc. Half-Life 2 is a registered trademark of Valve Corporation. Half-Life 2 and Valve are registered trademarks of Valve Corporation. All other company and/or product names are trademarks and/or registered trademarks of their respective owners.

SIGGRAPH 2004 Conference Registration Categories:

- ☒ Full Conference ☒ Conference Select ☐ Exhibits Plus

Schedule is Subject to Change. Check the SIGGRAPH 2004 web site often for updated information for this year's programs and events.

Conference at a Glance

	7 SATURDAY	8 SUNDAY	9 MONDAY	10 TUESDAY	11 WEDNESDAY	12 THURSDAY
Registration	6 - 8 pm	8 am - 6:30 pm	8 am - 6:30 pm	8 am - 6:30 pm	8 am - 6:30 pm	8 am - 3 pm
Merchandise Pickup Center	6 - 8 pm	8 am - 6:30 pm	8 am - 6:30 pm	8 am - 6:30 pm	8 am - 6:30 pm	8 am - 6 pm
SIGGRAPH Store	6 - 8 pm	8 am - 6:30 pm	8 am - 6:30 pm	8 am - 6:30 pm	8 am - 6:30 pm	8 am - 6 pm
☒ ☒ ☐ Exhibition				10 am - 6 pm	10 am - 6 pm	10 am - 5 pm
PRESENTATIONS						
☒ Courses		8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm	
☒ Papers			8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm
☒ Panels			10:30 am - 5:30 pm	10:30 am - 5:30 pm	1:45 - 3:15 pm	1:45 - 3:15 pm
☒ ☒ Sketches		8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm
☒ ☒ Posters		8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm	
☒ ☒ Web Graphics		1:45 - 5:30 pm	3:45 - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm	8:30 am - 5:30 pm
☒ ☒ Educators Program					8:30 am - 5 pm	8:30 am - 5:30 pm
☒ ☒ ☐ Keynote Address/Awards			1:15 - 3:15 pm			
Special Sessions						
☒ ☒ Real-Time 3DX: Demo or Die			6 - 8 pm			
☒ ☒ Computer Music				1:45 - 3:15 pm		
☒ ☒ Puppetry and Computer Graphics				6 - 8 pm		
☒ ☒ VJ: The Art of Live Video Performance					6 - 8 pm	
☒ ☒ Next-Generation Game Visuals						10:30 am - 12:15 pm
Special Event						
☒ ☒ ☐ Fast-Forward Papers Preview		6 - 8 pm				
☒ ☒ ☐ Exhibitor Tech Talks				10 am - 6 pm	10 am - 6 pm	10 am - 5 pm
EXPERIENCES						
☒ ☒ ☐ Art Gallery		1 - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 5 pm
Computer Animation Festival						
☒ Electronic Theater			7 - 9 pm	7 - 9 pm	7 - 9 pm	
☒ ☒ Electronic Theater Matinée				1:30 - 3:30 pm	1:30 - 3:30 pm	
☒ ☒ ☐ Animation Theater		1 - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 5 pm
☒ ☒ ☐ Emerging Technologies		1 - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 5 pm
☒ ☒ ☐ Guerilla Studio		1 - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 6 pm	9 am - 5 pm
☒ Reception					8 - 10 pm	
SERVICES						
☒ ☒ ☐ Birds of a Feather	Throughout the week					
☒ ☒ ☐ Get Involved					5 - 6:30 pm	
☒ ☒ ☐ International Resources	6 - 8 pm	8 am - 6pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 5 pm
☒ ☒ ☐ Job Fair				10 am - 4 pm	noon - 4 pm	
☒ ☒ ☐ Pathfinders	6 - 8 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 6 pm	8 am - 5 pm

**See what everyone is talking about.**

Nothing communicates design ideas faster than a three-dimensional part or model. Dimension 3D Printers let you build models and parts from CAD files – right from your desktop. With tough ABS plastic parts you can test form, fit and function – and as many design iterations as you like – before your competitors get off the drawing board.

For added hands-free convenience, consider the new Dimension SST with a water-soluble support removal system. Accelerate your

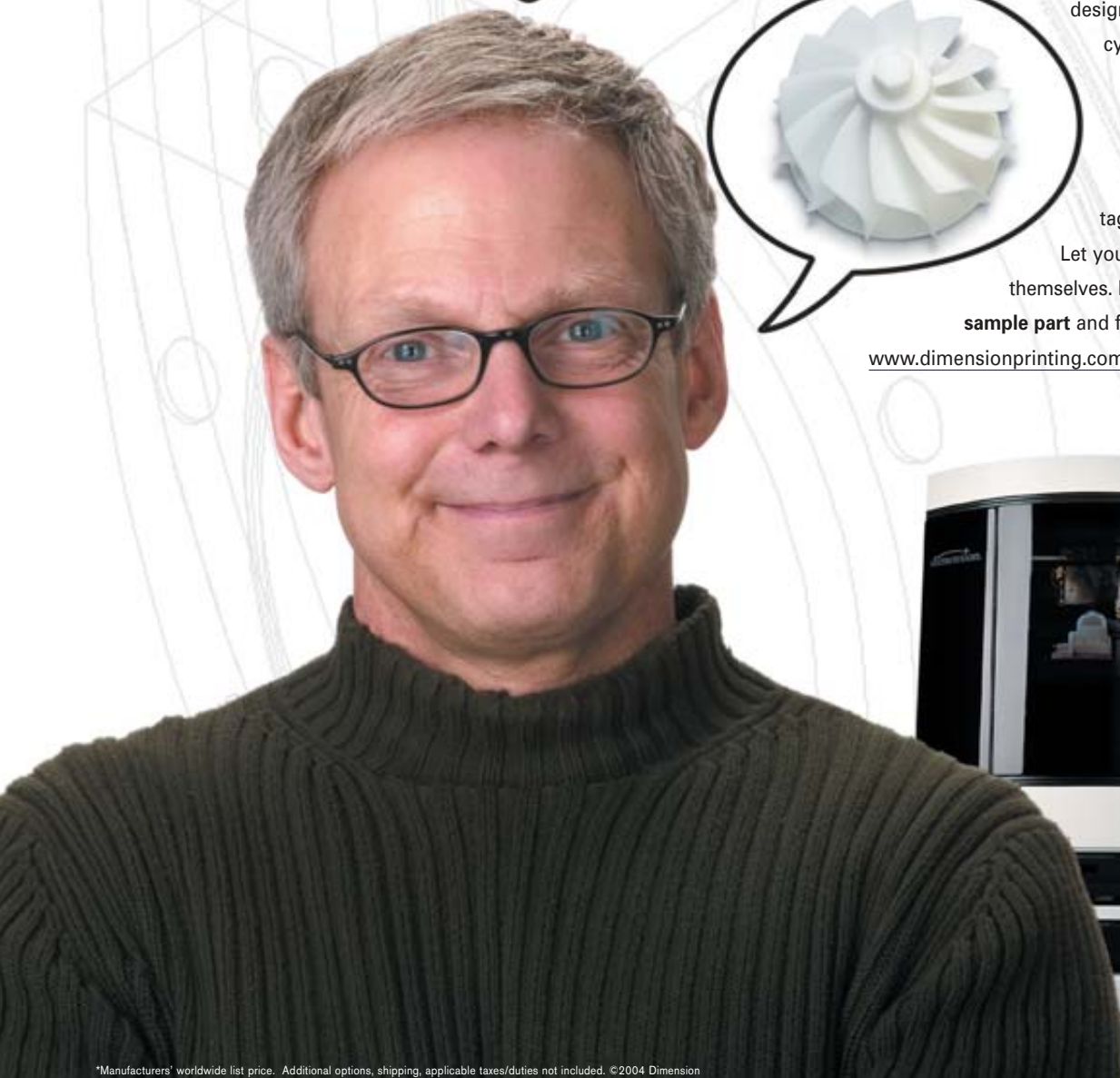
design and development cycle with the fastest selling office-friendly design tool of its kind.

Competitive advantage starts at \$24,900*

Let your ideas speak for themselves. Print 3D. **Get your free**

sample part and find your dealer at

www.dimensionprinting.com/sig



*Manufacturers' worldwide list price. Additional options, shipping, applicable taxes/duties not included. ©2004 Dimension

infoNOW 37 at www.onlinecenter.to/cgw

Powered by leading Stratasys technology for only **\$24,900***

Visit us at SIGGRAPH booth #1019

dimension™

www.siggraph.org/s2004

Conference Overview

SIGGRAPH 2004

Molecular interiors, galactic visions, tomorrow's visual effects.

Responsive machines, extra-human intelligence, alternative realities.

Code, concepts, mathematics, theories, applications.

World-class experts teach all this and more. Creative adventurers show 2004's most advanced achievements in computer graphics and interactive techniques. And you acquire the inside data you need to succeed in this amazing industry.

Register online today!

www.siggraph.org/registration



Keynote Address and Awards

Monday, 9 August, 1:15 - 3:15 pm

Bruce Sterling, science fiction writer, speculates on what happens when graphic simulation conquers the world.

When Blobjects Rule the Earth

A picture is worth a thousand words. A model is worth a thousand pictures. What happens when there's no longer any practical difference between computer-generated models and physical, manufactured objects? Desktop fabrication is a lab curiosity – so far – but what happens to societies, markets, industries, and professions when you can push “print” and spit out a bicycle?

Immediately before the keynote address, ACM SIGGRAPH presents the Computer Graphics Achievement Award to Hugues Hoppe, Microsoft Research; the Significant New Researcher Award to Zoran Popović, The University of Washington; and the Outstanding Service Award to Judith R. Brown, The University of Iowa (Retired); and Steve Cunningham, California State University, Stanislaus and National Science Foundation.





ACADEMY of ART UNIVERSITY

FOUNDED IN SAN FRANCISCO 1929

SEE WHAT WE DO
AND HOW WE DO IT.
COME VISIT OUR BOOTH.

Courses offered in:

2D & 3D Animation
3D Modeling
Computer Graphics
Filmmaking
Game Design
New Media
Visual Effects
Web Design

AA | BFA | MFA Degrees
Personal Enrichment | Online Courses
State-of-the-Art Facilities

**80% Overall Job Placement
upon Graduation**

TAP INTO THE TALENT

Post any full-time, part-time, freelance,
temporary job or internship online at

WWW.ACADEMYART.EDU/CAREERS.

Go to **POST JOB LISTINGS** link.

1.800.544.ARTS
www.academyart.edu



Art by recent graduate Jung-seung Hong, modeler at Industrial Light + Magic

79 New Montgomery St., San Francisco, CA 94105

Nationally Accredited by ACICS, NASAD & FIDER (BFA-IAD)

www.siggraph.org/s2004

SIGGRAPH 2004 Conference Registration Categories:

● Full Conference ● Conference Select ○ Exhibits Plus

Presentations



Courses

Sunday – Wednesday, 8-11 August

Practical skills, deep understanding, and clear explanations presented by the leading experts in computer graphics and interactive techniques. Tutorials, half-day sessions, and full-day courses teach beginning, intermediate, and advanced topics in digital art and science, including interaction design, perception, computing hardware, display systems, wireless applications, gaming, animation, and modeling. Complete list of Courses: www.siggraph.org/s2004/conference/courses



Papers

Monday – Thursday, 9-12 August

The premier international forum for ground-breaking, provocative, and important new work in computer graphics and interactive techniques. SIGGRAPH 2004 papers set the standard in the field, stimulate future trends, and explore challenging issues in related fields: human-computer interaction, computer-aided design, computer vision, robotics, visualization, web graphics, and computer games, among others. Complete list of Papers: www.siggraph.org/s2004/conference/papers



Panels

Monday – Thursday, 9-12 August

Debate, argument, and discussion on important topics in computer graphics and interactive techniques, and related fields. Experts and skeptics deliver opinions, insights, speculation, and summaries of recent work. The audience follows up with questions, comments, and criticism. The result: new perspectives on key questions and current controversies. Complete list of Panels: www.siggraph.org/s2004/conference/panels



Sketches

Sunday – Thursday, 8-12 August

Short talks followed by question-and-answer exchanges on a broad spectrum of topics in art, design, science, and engineering. Sketches emphasize novel and interdisciplinary applications of computer graphics and interactive techniques, including provocative speculation, academic research, industrial development, practical tools, and behind-the-scenes explanations of commercial and artistic works. Speakers and topics: www.siggraph.org/s2004/conference/sketches



Educators Program

Wednesday – Thursday, 11-12 August

Content: how to teach computer graphics and develop academic resources. Continuity: computer graphics in education, from pre-school to post-graduate study. Collaboration: between art and science, educators and researchers, teachers and students, the classroom and the real world. Panels, forums, papers, and Quick Takes explore all this and more in the not-just-for-Educators Program. Detailed information on the Educators Program: www.siggraph.org/s2004/conference/educators



Posters

Sunday – Wednesday, 8-11 August

New for SIGGRAPH 2004. Poster displays of research in computer graphics and interactive techniques, including newly developing projects, smaller works, incremental or partial results, and late-breaking research. Presenters and topics will be available here in July: www.siggraph.org/s2004/conference/posters



Web Graphics

Sunday – Thursday, 8-12 August

Presentations and demonstrations of the year's most innovative online work. Artists, designers, producers, and programmers from around the world share their achievements in rich internet applications, web 3D, navigation, visualization, usability, motion graphics, web art, web content for handheld devices, and many more areas. Speakers and topics: www.siggraph.org/s2004/conference/web

New for SIGGRAPH 2004: the popular 5k award competition for excellence in web design and production is part of SIGGRAPH 2004 Web Graphics.



Exhibitor Tech Talks

Tuesday – Thursday, 10-12 August

Late-breaking updates on the year's most important advances in 3D animation, games, shading, visualization, processors, APIs, career development, and more. In Exhibitor Tech Talks, SIGGRAPH 2004 exhibitors present two-hour tutorials and interactive instruction on their products and services.



Special Event

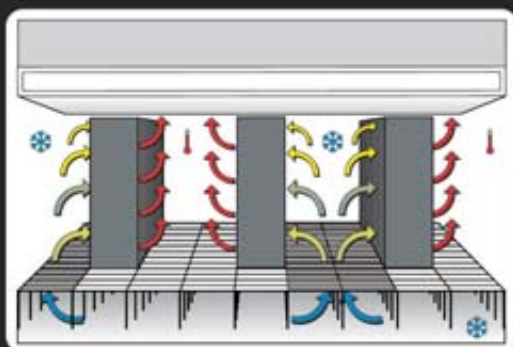
Fast-Forward Papers Preview
Sunday, 8 August, 6 - 8 pm

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

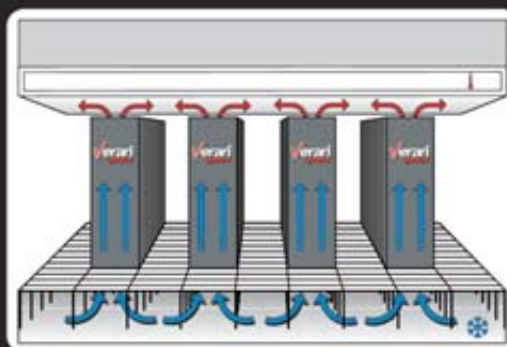
Verari
systems™

the coolest rack on the planet.

The Verari Systems™ BladeRack™ series features our patented **Vertical Cooling Technology**, which means your data center will be the coolest place to be this summer.



A traditional cluster installation can cause serious data center hot spots.



The Verari Systems patented Vertical Cooling Technology helps to protect your systems by eliminating data center hot spots.

The BladeRack family can accommodate up to 88 Nodes or 176 processors and can be easily expanded and upgraded with the latest technology, keeping your organization at peak productivity with the lowest possible operational costs. The BladeRack utilizes the AMD Opteron™ processor, which simplifies your business by giving you the performance you need today with more future capabilities than any other x86 processor. You and your business get the headroom needed for future applications and technologies.



Experience **real** performance by calling **888-942-3800**
or log on to **www.verari.com** for more info

infoNOW 39 at www.onlinecenter.to/cgw

© 2004, Verari Systems. All Rights Reserved. Verari Systems, the Verari Systems logo, and BladeRack are trademarks or registered trademarks of Verari Systems, Inc. AMD, the AMD Arrow logo, AMD Opteron, and combinations thereof are trademarks of Advanced Micro Devices, Inc.

Special Sessions



Real-Time 3DX: Demo or Die

Monday, 9 August, 6 - 8 pm

This demonstration highlights real-time graphics of all types in a fast paced, fun, and inspiring way. If you want to see the best real-time computer graphics work from industry, universities, and "secret" labs, this is the event for you. Participants have approximately two minutes to show off their best stuff in one of four categories:

- Business, Educational, Artistic, Scientific, Training
- Games, Entertainment
- 3D Multiuser Environments
- Emerging Technologies

All demos are non-commercial, and the host drags participants off the stage if they indulge in hype. Bring an enthusiastic attitude to the event and be prepared for serious fun. The audience votes for category and best-of-show winners, in real time, using an innovative laser-pointer voting system developed at Iowa State University. Bring your laser pointers!

Organizers

Sandy Ressler

National Institute of Standards Technology

Leonard Daly

Daly Realism



Computer Music

Tuesday, 10 August, 1:45 - 3:15 pm

The field of computer music, which has evolved from its origins in early computing technology, analog electronic music, digital signal processing, audio engineering, and the experimental music tradition, represents the nexus of modern creative and technical issues associated with digital audio and analysis. This Special Session features experts at the forefront of several primary research areas:

- Software-based sound synthesis
- Human-computer interface technologies for performers and composers
- Acoustic simulation of auditory environments
- Sound spatialization and presentation of electro-acoustic music
- Intuitive computer music composition
- Computer-assisted music composition and affective music computing systems
- Stylistic emulation and modeling of human performers
- Music information retrieval

Each panel member addresses ongoing research in these primary points of focus within the broader context of their historical impetus and potential future applications.

Organizer

Colby Leider

University of Miami



Puppetry and Computer Graphics

Tuesday, 10 August, 6 - 8 pm

Pioneering artists such as Jim Henson and Phil Tippett, and many other puppeteers, have been experimenting with computer graphics from the beginning.

Jim Henson's early CG puppets, Waldo C. Graphic and Tizzy the Bee, led to development of the Henson Digital Performance Studio, and, more recently, CG versions of Kermit the Frog and Gonzo the Great. Tippet's Digital Input Device first gave CG animation access to additional stop-motion animators working on "Jurassic Park" and "Starship Troopers." Virtual CG sets of "The Jim Henson Hour" and "The Wubbulous World of Dr. Suess" also added a broader freedom to the medium.

This special session reviews the history, advantages, and future of CG in puppetry, and it presents many personal stories from the puppeteers' perspective.



VJ: The Art of Live Video Performance

Wednesday, 11 August, 6 - 8 pm

The explosive new generation of visual artists known as VJs and the dozens of companies that support them with new tools, equipment, and software are continually creating more complex and vivid presentations. In this roundtable discussion hosted by Los Angeles Video Artists (LAVA), several respected and widely known VJs offer insight into current and future trends for this adventurous new culture. For more information and updates, see: www.la-va.org/siggraph2004

Organizer

James Cui

Los Angeles Video Artists (LAVA)



Next-Generation Game Visuals

Thursday, 12 August, 10:30 am - 12:15 pm

The next generation of game hardware and real-time, per-pixel shading will make it possible to create more compelling interactive visuals than ever before. Dramatic improvements are on the horizon in high-resolution models and textures, soft subtle lighting, complex character animation, and amazing visual effects. Presenters from top game companies, including Habib Zargarpur ("Need to Speed Underground" and "007 Bond: Everything or Nothing") and Henry LaBounta ("SSX3") from Electronic Arts, show examples of what they are doing now to push the envelope and speak about their plans for creating the breathtaking games of tomorrow.

Organizer

Henry LaBounta

Electronic Arts Canada

VXRACK

THE MOST POWERFUL CLUSTER EVER

**YOUR BUSINESS
CHALLENGES ARE REAL
YOUR SERVER SHOULD BE, TOO.**

Give the software that keeps your business running the power to get the job done right with **Ciara VXRACK** cluster based on the **Intel® Xeon™** processor.



VXRACK™ - 256 Intel® Xeon™ - 3.06GHz

One Single Rack
1.56TFIps Max Performance
 128 Computing Nodes
256 Intel® Xeon™ Processor 3.06GHz
 2GB ECC/DDR High Performance per node
 40GB HDD ATA 100 per node
1 PCI-X Slot per node
 Dual Gigabit Port per node
 8 Gigabit Switches 24 ports (layer 2,3 &4)
 All Cables, PDU and Rack Accessories



\$299,950*
\$269,950*

VXRACK™ - 128 Intel® Pentium® 4 - 3.2GHz

One Single Rack
819GFIps Max Performance
 128 Computing Nodes 800MHz FSB
128 Intel® Pentium® 4 Processor
 (3.2GHz-1MB L2 cache)
 1GB ECC/DDR High Performance per node
 40GB HDD ATA 100 per node
1 PCI Slot per node
 Ethernet Port 10/100 + 10/100/1000
 8 Gigabit Switches 24 ports (layer 2,3 &4)
 All Cables, PDU and Rack Accessories



\$149,850*

VXCUBE™ - 32 Intel® Itanium® 2 - 1.4GHz

One VXCUBE
 16 Computing Nodes
32 Intel® Itanium® 2 Processor
 (Special HPC - 1.4GHz, 3MB Cache)
4GB ECC/DDR PC266 per node
 40GB HDD ATA 100 per node
1 PCI-X slot per node
 Dual Gigabit Port per node
 1 Gigabit Switches 24 ports
 Integrated Power Distribution Unit



\$5,350*
 per node

Visit us at **SIGGRAPH 2004** Booth 2047



CALL TODAY 866-7VX-RACK
WWW.VXRACK.COM



Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, Pentium, and Pentium II Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
 *Important Information: All prices, specifications and promotional offers are subject to change without notice. Cisco cannot be responsible for typographical errors, photographic errors, pricing errors. All pricing in US dollar. Shipping and applicable taxes are not included.

infoNOW 40 at www.onlinecenter.to/cgw

www.siggraph.org/s2004

SIGGRAPH 2004 Conference Registration Categories:

● Full Conference ● Conference Select ○ Exhibits Plus

Experiences

●●○

Art Gallery: Synaesthesia

Sunday – Thursday, 8-12 August

Original digital art that emerges from the conjunction of cybernetics and human vision to help us re-experience, re-examine, and make sense of our bodies, our technologies, and our culture. Synaesthesia features visionary work in every field of digital art: 2D, 3D, interactive techniques, installations, virtual reality, multimedia, telecommunications, web art, and animation. For detailed information on the Art Gallery, visit: www.siggraph.org/s2004/conference/art

Computer Animation Festival

●●○

Animation Theater

Sunday – Thursday, 8-12 August

●

Electronic Theater

Monday – Wednesday, 9-11 August

The world's most innovative, imaginative works in computer graphics and interactive techniques: animation, visualization, simulation, visual effects, and technical imagery produced by adventurers who blend art and science into unique visual experiences. The Computer Animation Festival jury presents selected works in the Electronic Theater (matinée and evening shows) and the Animation Theater (throughout the week). For a complete list of accepted work: www.siggraph.org/s2004/conference/caf

●●○

Emerging Technologies

Sunday – Thursday, 8-12 August

Interactive displays of assumption-shattering concepts that will enhance human life in the near and distant future. What's next in ubiquitous computing, wearable systems, hand-held devices, real-time graphics, mobile technologies and much more: robotics, graphics, music, audio, displays, haptics, sensors, gaming, the web, artificial intelligence, visualization, collaborative environments, medicine, biotechnology, design, entertainment, aerospace, and art. For detailed information on the Emerging Technologies exhibits, visit: www.siggraph.org/s2004/conference/etech

●●○

Guerilla Studio

Sunday – Thursday, 8-12 August

The Guerilla Studio is an integrated network of machines for realizing ideas in 2D, 3D, 4D, and n-dimensional media, a working computer graphics laboratory for explorations in fine art, animation, science, and other CG disciplines. It features high-end computer workstations, a multitude of software (featuring 2D and 3D design), and print technologies. Artists, scientists, and engineers can walk in, create, and realize their creations right in the lab.

The Guerilla Studio also provides an educational component where artists in residence instruct attendees on technique and explore the possibilities of digital art.

●

Reception

Wednesday, 11 August, 8-10 pm

Computer graphics pioneers, students, executives, superstars, engineers, theorists, and fans of all genders and backgrounds gather for the international SIGGRAPH community's annual celebration. Food, drinks, music, and fun in a high-energy Los Angeles location.

Services

●●○

Birds of a Feather

Attendees who want to get together with others who share their interests, goals, technologies, environments, or backgrounds are invited to organize and/or attend a Birds of a Feather event. Questions? Review the Birds of a Feather FAQs at www.siggraph.org/s2004/conference/birds/faqs.php

To schedule a Birds of a Feather session prior to arrival, send email to: bofs@siggraph.org

●●○

Get Involved

Wednesday, 11 August, 5 - 6:30 pm

Inside information on how you can contribute your expertise and energy to SIGGRAPH 2005 and SIGGRAPH 2006. All attendees, exhibitors, and presenters are invited. All questions and comments are welcome.

●●○

International Resources

In the International Center, the multi-lingual International Resources Committee answers attendee questions, offers space for talks and demonstrations, and provides informal translation services. For the International Committee listing: www.siggraph.org/s2004/conference/international/committee

●●○

Job Fair

Leading companies in computer graphics discuss employment opportunities with SIGGRAPH 2004 attendees in a relaxed, informal setting. Sponsored by:

Ai The Art Institutes™
America's Leader in Creative Education



THE WORLD'S COOLEST FILM RENDERER

Introducing NVIDIA® Gelato™, breakthrough GPU-accelerated film rendering software. Gelato allows artists in the film and broadcast industries to produce images of uncompromising quality and complexity.

Gelato rockets your digital production pipeline into the future. Now rendering at a studio near you.

For more information and where to download or purchase the NVIDIA Gelato renderer, go to:

<http://film.nvidia.com>

infoNOW 41 at www.onlinecenter.to/cgw

© 2004 NVIDIA Corporation. NVIDIA, the NVIDIA logo, and Gelato are trademarks and/or registered trademarks of NVIDIA Corporation. All rights reserved.

Exhibition

Welcome to the future of computer graphics and interactive techniques. By its very nature, SIGGRAPH attracts an exclusive group of buyers from around the world, across all facets of this expanding technology. Much of the research in computer graphics is exploding into everyday products that are vital in today's technology-hungry culture. Organizations that support the tools used in computer graphics and interactive techniques are eager to take advantage of future opportunities.

What's the best way for your organization to meet these challenges that are reshaping the technology in computer graphics and interactive techniques? See the latest, most complete list of SIGGRAPH 2004 exhibitors: www.siggraph.org/s2004/exhibition

For a complete directory of the organizations that supply hardware, software, and systems to the computer graphics industry, visit: www.siggraph.org/industry

Reserve Your Space Now!

To purchase exhibition space for SIGGRAPH 2004, call or write:

SIGGRAPH 2004 Exhibition Management
Hall-Erickson, Inc.
98 East Naperville Road
Westmont, Illinois 60559 USA

+1.630.434.7779
+1.630.434.1216 fax
halleric@siggraph.org



3D scanning...

...for Complex Objects



DESKTOP 3D SCANNER

High resolution, compact:
Sculptures
Models
Bones



HIREZ MINI MODEL SHOP COLOR 3D SCANNER

High resolution, mid-size models:
Design
Prototypes
Reverse
Engineering



MODEL SHOP COLOR 3D SCANNER

Standard resolution, large models:
Large sculpture
Maquettes
Industrial Models

...for Human Subjects



HEAD AND FACE COLOR 3D SCANNER

Standard resolution, composite human face or head:

Animation
Engineering
Design
Virtual Reality



WHOLE BODY SCANNERS (WB4 & WBX)

Full resolution, whole body scanning:
Animation
Fashion
Ergonomics

infoNOW 42 at www.onlinecenter.to/cgw

**Whatever You're Scanning,
Cyberware provides an entire line
of 3D scanners that are fast,
accurate, and easy to use.**

CELEBRATING 20 YEARS OF 3D SCANNING!
www.cyberware.com
email: info@cyberware.com

Cyberware®

www.siggraph.org/industry

For a complete directory of the organizations that supply hardware, software, and systems to the computer graphics industry.

Exhibitors

As of 25 May 2004

@Last Software, Inc. - SketchUp

3Dconnexion

3D Consortium

3D Nature, LLC

3D Pipeline Corporation

3DTotol.com

3rdTech, Inc.

4DCulture Inc.

5DT (Fifth Dimension Technologies)

A K Peters, Ltd.

Academy of Art University

Accorn, Inc.

Actuality Systems, Inc.

Adobe Systems Incorporated

Advanced Imaging Magazine

AJA Video Systems Inc.

Alias Systems

AMAX Information Technologies

AMD

American Paper Optics, Inc.

Anark Corporation

Animation Magazine Inc.

Anthro Corporation

Apple Computer, Inc.

ArchVision, Inc.

ARRI Group

The Art Institutes

Artbeats, Inc.

Asaca/Shibasoku Corporation of America

ASC - American Cinematographer

Ascension Technology Corporation

ATI Technologies Inc.

Auto FX Software

auto.des.sys, Inc.

AWN, Inc.

AXIO, LLC

Barco

Baydel (DataFrameworks)

Bell Computer

Bionatics

BioWare Corp.

Bitboys Oy

BitMicro Networks, Inc.

Blue Sky Studios, Inc.

BlueArc Corporation

BOXX Technologies, Inc.

Brigham Young University

Canadian Film Centre

cebas Computer GmbH

CELCO, Inc.

Chaos Group

Character Animation Technologies Ltd.

Charles River Media

Ciara Technologies

Collins College

The Compulsive Creative

Computer Graphics World

Course PTR

Curious Labs Incorporated

Curious Software Company Limited

da Vinci Systems, Inc.

Darim Vision Co., Ltd.

DataDirect Networks, Inc.

DAZ Productions, Inc.

Desktop Images

Digital Anarchy

Digital Domain, Inc.

Digital-Tutors.com

Disc Makers

Discreet

DNP Electronics America, LLC

Doremi Labs, Inc.

DVS GmbH

Electronic Arts Inc.

Elumens Corporation

ESC Entertainment

eyeon Software Inc.

FCS Control Systems B.V.

Focal Press

FX3X

Geometry Systems, Inc.

Global Digital Creations Holdings Limited

Gnomon, Inc. School of Visual Effects

Grande Vitesse Systems

GraphStream

Hash Inc.

Hewlett-Packard Company

Hollywood Creative Directory

Hoodman Corporation

IdN Magazine

IEEE Computer Society

Illuminate Labs

IMAGICA Corp.

Immersion Corporation

Immersive Media Company

Inch by Inch Productions

Industrial Light + Magic

The Industry Flip Book

Infusion Systems Ltd.

InSpeck Inc.

IntegrityWare, Inc./nPower Software, Inc.

Intel Corporation

InterSense, Incorporated

Isilon Systems, Inc.

Italian Institute for Foreign Trade

JourneyEd.com

Kaydara, Inc.

Kelseus Ltd.

La Cantoche Production

Lasergraphics, Inc.

Lightspace Technologies, Inc.

LightWork Design Ltd.

Massive Software

MAXON Computer Inc.

Measurand Inc.

Media Design School

Meta Motion

Micoy

Midway Home Entertainment Inc.

Millimeter/Video Systems

Morgan Kaufmann Publishers

Motion Analysis Corporation

NaturalMotion Ltd.

NEC-Mitsubishi Electronics Display

NewTek, Inc.

New Zealand Trade and Enterprise

Nexstar

Next Limit S.L.

NIST Advanced Technology Program

nStor Corporation, Inc.

NVIDIA Corporation

NXN Software AG

Okino Computer Graphics, Inc.

Oregon3D, Inc.

The Orphanage Inc.

Panasas Inc.

Panasonic

Panoscan Inc.

PDI/DreamWorks

Peachpit Press

Perforce Software

Photron USA, Inc.

P.I. Engineering, Inc.

Pipelinefx, LLC

Pixar Animation Studios

Pixologic, Inc.

Plenoptics

PNY Technologies, Inc.

Point Grey Research Inc.

Polhemus, Inc.

Post Magazine (Advanstar

Communications)

ProMax Systems, Inc.

Purdue University, Department of

Computer Graphics Technology

Radical Entertainment Inc.

Realviz S.A.

rebelThink digital effects

Relic Entertainment Inc.

Rhythm & Hues Studios

Right Hemisphere

Ringling School of Art and Design

Savannah College of Art and Design

SensAble Technologies, Inc.

SGI

Side Effects Software

Softimage Co.

Solid Modeling Solutions

Sony Pictures Imageworks Inc.

SpectSoft, LLC

SpheronVR AG

Springer-Verlag New York, Inc.

Stratasys Inc.

Sybex, Inc.

SyFlex LLC

Systems in Motion AS

Technical Animations, Inc.

TechnoDream21

terratracer Inc.

Texas Memory Systems, Inc.

TGS, Inc.

University of Kassel

Vancouver Film School

Verari Systems, Inc.

Vicon Motion Systems, Inc.

Virtools SA

Wacom Technology Corporation

Walt Disney Feature Animation

John Wiley & Sons, Inc.

wondertouch, LLC

WorldViz LLC

Worldwide FX/E.E.C.C. Ltd.

X3D Technologies Corp.

Xerox Corporation

XYZ RGB Inc.

Z Corporation

attitude and understanding:

a compositing community
forged from the depths of
forward thinking.

Digital Fusion



CAFE FX

www.eyeononline.com

Gothika Image Courtesy CAFE FX
Copyright Dark Castle Productions

Copyright © 1988-2004 eyeon Software Inc. All rights are reserved.
eyeon Digital Fusion, Digital Fusion and DFX+ are registered trademarks of eyeon Software Inc.
All trademarks, company names and products are the property of their respective holders.

eyeon

Recent DF productions include Gothika, Master and Commander, The Last Samurai, Matrix Revolutions, Paycheck and Les Triplettes de Belleville.

Visit eyeon at Siggraph 2004 - Booth #1429

infoNOW 43 at www.onlinecenter.to/cgw

Exhibitor Tech Talks

The Power of Pixel Shaders: Using High-Level Shading Languages in Professional Applications

ATI Technologies Inc.
Tuesday, 10 August, 1 – 3 pm

Programmable pixel shaders are all the rage for today's computer games. But how can they be leveraged in today's workstation software applications? Learn how high-level shading languages are used to create a new generation of professional content creation and CAD applications.

MOTIONBUILDER

Kaydara Inc.
Tuesday, 10 August, 4 – 6 pm

An in-depth look at Kaydara's renowned 3D character animation application, MOTIONBUILDER. Includes demonstrations by special guests.

Training for Careers in Animation and Technology

Vancouver Film School
Wednesday, 11 August,
10 am – Noon

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

PCI Express* Technology: A Breakthrough Technology for the Graphics Industry

Intel Corporation
Wednesday, 11 August,
10 am – Noon

PCI Express Technology, a new I/O interconnect technology replacing PCI and AGP in 2004 systems, promises to offer a plethora of performance advancements for the graphics community. In this session, Intel experts discuss the performance attributes of PCI Express-enabled workstations and rendering-farm applications, and explain the availability of PCI Express graphics capability.

Middle Earth: Imagination Made More Real

New Zealand Trade and Enterprise
Wednesday, 11 August, 4 – 6 pm

A showcase of New Zealand's creative technology companies specializing in cutting-edge animation, simulation, 3D-modeling, and augmented reality.

NVIDIA Corporation

Tuesday - Thursday, 10 - 12 August
10:30 am, 1:30 pm, 3:30 pm

HLSL Shader Workshop: Introductory

NVIDIA invites you to try your hand at writing shaders and other real-time effects! This hands-on workshop introduces real-time shader programming with the Microsoft DirectX 9.0 High-Level Shader Language (HLSL). Attendees learn how to harness the power of the latest GPU technology through a language as familiar as C while using a powerful shader IDE. Developers learn how to integrate shaders with their applications and create new effects that are only possible with Shader Model 3.0.

The workshop also includes tips for writing efficient shaders and strategies for debugging them. The workshop is intended for experienced graphics programmers familiar with fundamental 3D graphics techniques, including simple matrix math.

HLSL Shader Workshop: Advanced

In this hands-on NVIDIA session, attendees develop a variety of advanced shader effects, including new effects that are only possible with Shader Model 3.0 as found in the Microsoft DirectX 9.0 High-Level Shader Language (HLSL). The focus is on practical, high-quality techniques that can easily be integrated with attendees' ongoing and future projects to help set them apart from the pack. Topics include high-dynamic-range lighting (HDR), floating-point filtering, and floating-point blending.

The workshop also includes tips for writing efficient shaders in the NVIDIA FX Composer IDE, strategies for debugging shaders, and an overview of potential applications in graphics and general-purpose scenarios. The advanced session is for experienced coders who are already conversant with writing shaders and want to take their knowledge to a higher level.

Evolve > Your work. Your way. Introducing **3ds max 6**.

" Crazy and challenging—that's what the visual effects business is. As a visual effects supervisor, I find **3ds max**® irreplaceable in our pipeline. It provides a multitude of approaches to our complex challenges, the flexibility to support our own scripts and pipeline tools, and customisation capabilities to shape it into whatever we need. **3ds max** allows our artist's to personalise the way they work, yet maintain studio-wide standardisation. With **3ds max**, we're able to stay sane and deliver on-time against the high-paced insanity."

Check out Ben's **3ds max** work and sign up to get a free 30-day trial of **3ds max** at www.discreet.com/evolve.

3ds max /ben

Visual Effects Supervisor, Founder
Ben Girard

Studio
Digital Dimension

Awards
Four time Emmy Award winner

Focus
Motion Pictures Visual Effects
Elf, November '03
The Last Samurai, December '03
Freddy vs. Jason
Duplex
Final Destination II
Reign of Fire
Mr. Deeds

Broadcast Effects and Design
Alias, ABC
TBS SuperStation
Pepsi World Cup Ad
Nascar, FOX
NFL, FOX
Super Bowl XXXVI
Super Bowl XXXIII

3ds max® 6
discreet®

infoNOW 44 at www.onlinecenter.to/cgw

See the Evolution at Siggraph 2004, booth #1700

Discreet is a division of Autodesk, Inc. Autodesk, Discreet, and 3ds max are either registered trademarks or trademarks of Autodesk Inc./Autodesk Canada Inc., in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. © Copyright 2004 Autodesk, Inc. All rights reserved.

ACM Student Research Competition

Wednesday, 11 August

Sponsored by Microsoft Research, the ACM Student Research Competition is an internationally recognized opportunity for undergraduate and graduate researchers to:

- Share research results
- Exchange ideas and gain new insights
- Meet and talk with academic and industry luminaries
- Understand the possible, practical applications of their research
- Perfect their communications skills

Finalists will be selected to present a talk on Wednesday, 11 August, 3:45 - 5:30 pm, at SIGGRAPH 2004. For more detailed information: www.siggraph.org/s2004/conference/posters

Call for Volunteers

ACM SIGGRAPH relies heavily on volunteers to plan and produce the premier international conference on computer graphics and interactive techniques. Volunteer opportunities for this vibrant event include: future conference chairs, SIGGRAPH 2005 subcommittee members, SIGGRAPH 2006 program chairs, and additional on-site volunteers for most years.

Explore how you can contribute your ideas, energy, and expertise at: www.siggraph.org/volunteering

Future Conference Dates

SIGGRAPH 2005
31 July - 4 August 2005
Los Angeles, California

Co-Located Events

The annual SIGGRAPH conference is expanding the number and breadth of co-located workshops and small conferences. Two events are co-located with SIGGRAPH 2004:

GP²: Workshop on General Purpose Computing on Graphics Processors

7 - 8 August 2004
Wilshire Grand Hotel
Los Angeles, California

Talks, panels, and poster presentations by leading researchers and practitioners from academia, research labs, and industry on several issues, including:

- Could GPUs become useful co-processors for a wide variety of applications?
- What are their algorithmic and architectural niches and can they be broadened?
- Programmability, language and compiler support, and software environments.
- Future technology trends that might lead to more widespread use of GPUs.

More information and registration: www.cs.unc.edu/Events/Conferences/GP2/

First Symposium on Applied Perception in Graphics and Visualization

7 - 8 August 2004
Wilshire Grand Hotel
Los Angeles, California

A forum for wider exchange of ideas and information between members of the graphics and visualization communities who are developing more effective visual, auditory, and/or haptic representation, and members of the vision-sciences community who are using computer graphics to investigate fundamental perception processes.

More information and registration: www.graphics.umn.edu/apgv04/

Inquiries about co-locating events with the annual SIGGRAPH conference should be directed to:

Barbara Helfer
ACM SIGGRAPH Vice President
colocate@siggraph.org

Image Credits

Front Cover

Waves_H © 2003 Kumiko Kushiya
Dimension of Time in Strange Attractors © 2003 Robert J. Krawczyk
Holy Cow-The Labyrinth & The Goddess © 2004 Annika Erixán
Metagon 128 © 2003 Jean-Pierre Hébert

Conference Overview

2002_21 © 2003 Terry Calen
Observational Drawings-Hand © 2004 Liz Lee

softimage.com

SOFTIMAGE® | XSI®

Announcing version 4.0

"Water Flowers" designed for Softimage Co. by Me Company

Superior engineering. Visionary architecture.
Never before has a software solution been so open and so flexible. **SOFTIMAGE | XSI**
version 4.0 is completely customizable, offering unmatched access to the core of the
software and giving unparalleled control over a dramatically accelerated creative process.

i am 4. the future of animation.**Come see us at booth #1547**Available online at store.softimage.com from \$1,995^{USMSRP}

© 2004 Avid Technology, Inc. All rights reserved. All prices are USMSRP for the U.S. and Canada only and are subject to change without notice. Contact your local Avid office or reseller for prices outside the U.S. and Canada. SOFTIMAGE, Avid, XSI, and make manage move | media are either registered trademarks or trademarks of Avid Technology Inc. in the United States and/or other countries. All other trademarks contained herein are the property of their respective owners.

Avid
make manage move | media™

A New Twist On Reality

Introducing



WILDCAT
REALiZM™

Welcome to reality with a twist . . . where you don't compromise creativity because of slow, inflexible graphics hardware. Introducing 3Dlabs® Wildcat® Realizm™ - a family of programmable graphics accelerators that's so advanced, it's more than next-generation good. It's like we reinvented graphics technology and gave it a whole new name. With optimum, real-world application performance and the industry's newest and most advanced visual processing right at your fingertips, animations, intricate CAD models, or complex scientific visualizations are rendered as you imagine them - in real time - with Wildcat Realizm.

Remove the Boundaries...
Realize Your Potential

www.3dlabs.com

infoNOW 46 at www.onlinecenter.to/cgw

Features:

- Wildcat Realizm 100 and 200 support AGP 8x
- Wildcat Realizm 800 supports 16x PCI Express
- Flexible floating-point visual processing
- Industry's largest amount of onboard memory
- New-generation framelock/genlock support

3Dlabs®

A CREATIVE™ Company

VIDEO

DVD Workshop 2

Ulead's latest DVD authoring software is replete with robust tools

By Frank McMahon

Ulead's DVD Workshop is a solid, easy-to-use program with which you can quickly get up and running, burning DVDs without a steep learning curve. The new Version 2.0 of the software does not alter the solid foundation; yet, it does add many new, professional features that make it well suited to any design studio.

DVD Workshop 2 is divided into five different screens: Start, Capture, Edit, Menu, and Finish. The program does not follow a standard Microsoft Windows menu/toolbar layout, so it can take a few minutes to figure out where everything is. In the Start screen, you can not only create a new project, but also save multiple versions of a job.

In the Capture screen, you can grab video directly from your camcorder. Although the program was rock solid otherwise, I experienced some trouble with the program finding my FireWire device and capturing correctly. Upon first try, the program couldn't locate my device, and then once it did, it would start to capture, a process I could not stop. After a reboot, capturing with the program worked fine. Capturing can be the most challenging element because many variables with different devices are involved.

The Edit page is where you can tweak and chop up your video clips and title screens. You can add transitions between

images; add in a narration, music, or commentary; and type in subtitle tracks.

The program can make automatic slideshows, a significant benefit. Simply drag in a stack of stills and the program arranges them as a slideshow on the DVD with a default transition. You can add music or alter the transitions. More than 100 options are offered, including wipes, peels, slides, and 3D effects—all very professional and varied. The subtitle feature is one of the most robust I have seen in a program of this type. You can add multiple subtitle tracks in many languages, typing them in and cueing them to appear at specific times during the video. You can also add in a preexisting text track that has metadata synced to your footage, all while adjusting such subtitle attributes as border, background, font type, font color, and location on screen.

On the Menu page, you can add full-motion menu screens and animated buttons and text. A wealth of options are available for jazzing up text and graphics with drag-and-drop templates. The Finish screen helps burn your final project to a DVD, an ISO disc image, or a DLT device.

How did Ulead improve upon an already solid program? It packed it with new features. It now supports the use of up to eight audio tracks. It will automatically fade in and out of each, if you wish, and provide control over the audio levels. Subtitle tracks can number up to 32, each with its own dedicated language code. Metadata, such as time code information from DV footage, can be displayed in a subtitle track.



Despite a wealth of high-end features, Ulead's DVD Workshop Version 2 has a gentle learning curve.

In Version 2, menus can be multi-layered with image masking, transparency, and video motion buttons. Input and output options have been enhanced to include a wider variety of options. For example, you can now import Dolby Digital 2.0/5.1, Photoshop PSD, GIF animation, CD audio, Sony MICROMV, and WMV files. As for output options, you can produce dual-layer DVD-9 format discs and add Macrovision and CSS copy protection. The program will also take two-channel audio and simulate surround sound on your final DVD.

DVD Workshop 2 also is much more efficient. A new MPEG Direct feature captures video and converts it to MPEG on the fly and saves it to your hard drive. Smart Rendering enables you to render only that which needs to be compressed when going to disk. Instant Burning can create a DVD without the need to render out an ISO image or temporary file to your hard drive.

Ulead has raised the bar on an already polished program by adding more useful features. Although the software is easy to learn and use, don't be misled. It is a professional-level DVD authoring tool that can be used to create high-end productions. You can dive into it easily, adapt to it quickly, and use it to produce high-quality DVDs with graphic and text attributes that are sure to leave your clients impressed. ■■

Frank McMahon (www.fmstudio.com) is a graphics professional with more than 15 years' experience testing high-end software and hardware tools for the creative community.

DVD Workshop 2

stats

Price: \$495 for the full version, \$295 as an upgrade

Minimum System Requirements: Windows 2000 or XP, Intel Pentium III 800MHz or higher, 128MB of RAM, 500MB of hard disk space for program installation, 14GB hard disk space for video capture and converting, Microsoft DirectX 9, DVD-ROM drive, at least a Pentium 4 2GHz or equivalent for real-time preview, and 512MB of RAM.

Ulead

www.ulead.com
infoNOW 115

products

For a direct link to more product information and vendor Web sites, click on:

www.onlinecenter.to/cgw

SOFTWARE

SKETCHING

For OS X

Win+Mac Alias has announced the availability of its pen-driven sketching and annotation software, SketchBook Pro, for Mac OS X operating systems. Alias SketchBook Pro Version 1.1 sports Mac compatibility, 26 hotkeys, a single layer copy tool, a redesigned brush editor, and more. The latest edition is available for download from Alias's Web site at a cost of \$179 or on CD-ROM for \$199. Current users of SketchBook Pro 1.0 for Windows can upgrade to Version 1.1 for free.

Alias; www.alias.com

infoNOW 116

VIDEO

Effects Design

Win Allegorithmic has released MaPiTime, a new plug-in for use with Adobe's After Effects and Discreet's Combustion. Reported to be the industry's first fully editable, heterogeneous video filter designer, MaPiTime

effects and image distortion, color manipulation, and temporal effects. MaPiTime also provides compatibility with Allegorithmic's MaPiZone texture modeling software.

Allegorithmic; www.allegorithmic.com

infoNOW 117

Useful Upgrade

Win Profound Effects has debuted Version 1.5 of its Useful Assistants workflow enhancer for Adobe's After Effects. As well as compatibility with After Effects 6.5, Useful Assistants 1.5 boasts 28 new and updated assistants, bringing its total to more than 110. These assistants are designed to automate repetitive and difficult tasks, simplifying and speeding work flow. Useful Assistants 1.5 carries a \$195 suggested retail price; yet, owners of previous versions can download the upgrade at no cost from the Profound eXchange, an online community on the Profound Effects Web site. The company also upgraded its Useful Things effects plug-in to Version 1.6. The latest version adds nearly limitless CHOPs (channel operations) potential, support for After Effects 6.5, and updates to more than 50 existing effects. Useful Things 1.6 is priced at \$295 for new users and free to owners of previous versions.

Profound Effects; www.profoundeffects.com

infoNOW 118

NLE News

Win Canopus has unveiled Edius 2.5, an upgraded version of its NLE software solution. Version 2.5 includes a new cropping, scaling, and repositioning tool and an Edius keyboard customization applet. Users of the new version also gain the ability not only to select, move, and apply filters and transitions to multiple clips simultaneously, but also to merge Edius projects. Edius 2.5 enables the importation of Canopus Imagine 2.0 projects, as well as AIFF and Ogg Vorbis audio files, and

the use of VST audio plug-ins. The upgraded application sports Inscribe TitleMotion Pro for Canopus, a titling tool for creating broadcast-quality text, graphics, and effects. Now available, Edius 2.5 is priced at \$599.

Canopus; www.canopus.com

infoNOW 119

HARDWARE

DISPLAYS

Professional Plasma

Samsung has released its latest large-screen, plasma displays for commercial and professional applications, including digital signage, multimedia presentation, and professional video. Offering 1024x768 resolution and a 3000:1 contrast ratio, the 42-inch PPM42H3



achieves high-definition output by matching the 720P HDTV format pixel-by-pixel. The PPM42S3Q is a 42-inch display capable of 1366x768 resolution and featuring 852x480 resolution. The 50-inch PPM50H3Q is well suited to presentation and digital signage applications, whereas the 63-inch PPM63H3Q can replace front and rear screen projectors. Samsung's latest generation of plasma displays incorporates the company's Digital Natural Image enhancement (DNIE), Anti-Burn technologies, variable aspect ratios, and Picture-by-Picture functionality.

Samsung; www.samsungusa.com/plasma

infoNOW 120



enables digital artists to create and edit complex animated patterns, effects, and transitions. Available now at a cost of \$990, the MaPiTime plug-in incorporates more than 350 preset visual effects. Among them are non-photorealistic rendering filters and

visit the
world
of content
creation • management • delivery

40k+ attendees from Europe
and 120 countries worldwide

1,000 exhibitors including all
the key technology suppliers

The world's best electronic
media conference



2004

Exhibition 10 - 14 September
Conference 9 - 13 September
RAI Amsterdam

www.ibc.org

products

PROJECTOR

4K Projection

Sony has amended its product line with two new 4K projectors for the digital cinema market, the SRX-R110 and SRX-R105. The SRX-R110 is a 10,000 ANSI lumen model well suited to screens of up to 40 feet wide, whereas the SRX-R105 is a 5000 ANSI lumen edition targeted at screen widths of up to 25 feet. Both devices offer 4093x2160 pixel resolution, thanks to the use of a Silicon X-tal Reflective Display (SXRD), and a high contrast ratio.

Sony; www.sony.net

infoNOW 121

WORKSTATIONS

Alienware ALX

Alienware has introduced ALX, a new brand of high-performance computer systems. Desktop, notebook, and professional systems that fall under the Alienware ALX brand incorporate the company's liquid cooling technology, including a specially mixed coolant and gold-plated, pure copper coolers. ALX customers can have CPU, memory, and video card settings over-

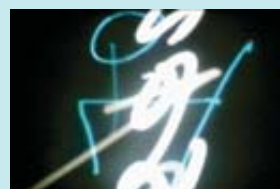
STOCK OPTIONS

REELHOUSE RELEASES

Producer of royalty-free video footage and video FX, Reelhouse recently released the *Film Leader FX Library*. *Film Leader FX Library* is the latest offering in the company's collection of stock videos, backgrounds, and effects offered in network-quality NTSC and PAL formats. The new offering by Adam Roe includes two Mac and PC-compatible DVDs housing a total of more than 200 film leaders and FX built from rare 16mm and 35mm sources. *Film Leader FX Library* is priced at \$399. Also new from Reelhouse is *8mm Mask Kit*, a collection of 25 mask films priced at \$299. The cross-compatible DVD provides masks, suitable for use in combinations or alone, for creating film flickers, scratches, and melts. The company also has launched Reelhouse.com, said to be the world's largest royalty-free film FX library for video professionals and the result of six years of compilation work.

Reelhouse; www.reelhouse.com

infoNOW 123

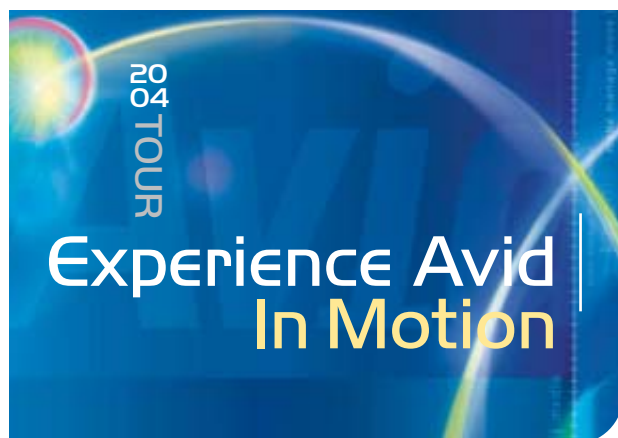


clocked by Alienware. In addition to the AlienCare Service Program, ALX users will receive one-on-one attention from Alienware's staff, the option of speaking with their system's assembler, and the ability

to have up to three of their favorite games installed, updated, and optimized on their system at no charge.

Alienware; www.alienware.com

infoNOW 122



Fresh from NAB 2004!

Our hottest new products are coming to a city near you. Get a first-hand look and learn how today's post professionals stay on the fast track with Avid®.

Food. Drinks. And a whole lot to see and hear.

- New Avid DNxHD™ encoding for mastering-quality HD media at SD file sizes
- HD editing and finishing with Avid DS Nitris™
- The most powerful Media Composer® Adrenaline™ ever!
- Avid Xpress® Studio: The Complete Suite
- SOFTIMAGE® | XSI® 4.0 3D animation tools

Los Angeles • New York • Chicago • Miami • Washington, D.C.

For more information, dates, and times, please visit www.avid.com/tour. Space is limited, so register today!

© 2004 Avid Technology, Inc. All rights reserved. Product features, specifications, system requirements and availability are subject to change without notice. Adrenaline, Avid, Avid Xpress, Avid DNxHD, make manage move | media, Media Composer, Nitris, and Softimage and XSI are either registered trademarks or trademarks of Avid Technology, Inc. in the United States and/or other countries. All other trademarks contained herein are the property of their respective owners.

make manage move | media™ **Avid**

infoNOW 21 at www.onlinecenter.to/cgw



Sponsored by ACM SIGGRAPH

"SIGGRAPH is where I see the things that inspire me to do my best work, and once I've done it, a place to share it with the whole community. It's the year's most amazing convergence of academia, visual effects, games, arts, software, and hardware in one location."



Interaction
Creation

Reconnection

REALIZE

Knowledge

Return on Investment
Your Self

Paul Debevec

Executive Producer, Graphics Research
USC Institute for Creative Technologies

conference
8-12 AUGUST 2004
exhibition
10-12 AUGUST 2004

Los Angeles Convention Center

www.siggraph.org/s2004

SIGGRAPH2004



the World's Premier Conference on Computer Graphics and Interactive Techniques

Body-Brush ©2002 Horace Ip, City University of Hong Kong | The Boxer ©2002 Tae Sik Shin, Tube Animation Studio | Cohesion ©2002 Carlo H. Séquin
Influencing Bone Remodeling in Osteoporosis ©2002 Jane Hurd, Hurd Studios | Molecular Visualization of DNA ©2002 The Walter and Eliza Hall Institute of Medical Research

events

AUGUST

2-5

LinuxWorld Conference & Expo, held in San Francisco. Contact 800-657-1474, www.linuxworldexpo.com.

8-12

SIGGRAPH 2004, held in Los Angeles. Visit www.siggraph.org.

15-27

2004 Oregon3D Film Camp, held in Portland, Oregon. Contact Oregon3D at 866-626-9100, www.oregon3d.com/filmcamp.html.

SEPTEMBER

9-13

IBC2004 Conference, held

in Amsterdam. Contact International Broadcasting Convention (IBC), www.ibc.org.

OCTOBER

23-30

2004 Savannah Film Festival, held in Savannah, GA. Contact Savannah College of Art and Design, 912-525-5051, www.scad.edu/filmfest.

25-27

CTIA Wireless I.T. & Entertainment 2004, held in San Francisco. Contact the Cellular Telecommunications & Internet Association (CTIA), www.ctia.org.



PolyTrans and NuGraf The "Next Generation" Packed With Great New Functionality!

Trusted and Refined Productivity Tools for Complex 3D File Conversion, Optimization, Viewing, Rendering & More!

Download the new V4 demo now!

See our new WEB site for version 4 feature list.



Example "CAD to non-CAD" conversion. Unigraphics to Lightwave. Converted & optimized by PolyTrans. © 2004 CraneDigital, LLC, www.cranedigital.com.

Okino's NuGraf® & PolyTrans® are indispensable production pipeline tools that perform clean, robust and reliable file translations (scene, NURBS, CAD and animation data), rendering, material editing, optimization and viewing of the most popular 3D file formats.

Okino Computer Graphics, Inc.
Tel: (Toll Free) 1-888-3D-OKINO, (1-905) 672-9328
WEB: <http://www.okino.com>, Email: sales@okino.com
All products mentioned are registered trade names of their respective holders.

infoNOW 23

showcase



ANIMATION & COMPUTER ARTS

Art by Jung-seung Hong, Recent Graduate, ILM Modeler

Register for Summer Classes Now through June 19

Courses Offered in:

2D & 3D Animation | 3D Modeling
Character Design | Computer Graphics
Digital Imaging | Filmmaking | Game Design
New Media | Visual Effects | Web Design

AA | BFA | MFA Degrees | Personal Enrichment
Online Courses | State-of-the-Art Facilities



ACADEMY of ART UNIVERSITY
FOUNDED IN SAN FRANCISCO 1929

1.800.544.ARTS | www.academyart.edu

79 New Montgomery St. | San Francisco, CA 94105
Nationally Accredited by ACICS,
NASAD & FIDER (BFA-IAD)

A GREAT COLLEGE IS NOW A GREAT UNIVERSITY.
FORMERLY ACADEMY OF ART COLLEGE

SOLIDS++ The Modeling Kernel of the Future

**Don't get Left Behind with Old Technology;
Leap into the Future with IntegrityWare's
Next Generation Modeling Kernel**

Visit IntegrityWare.com today and see why
SOLIDS++ should be in your future plans now!

See SOLIDS++ in Action!
Download free Demo versions
of Power Plug-ins from
www.nPowerSoftware.com



Jet Engine Conceptual Design using our NURBS and Polygon Technology

www.IntegrityWare.com iwinfo@IntegrityWare.com +1.858.538.3800

infoNOW 25

Moving Toward the Future
**Easy, Accurate, Affordable
Motion Capture Solutions**

Gypsy™ Motion Capture System:
Wireless — records motion on the body in real-time
with no cameras - no occlusion. Easy transport.
Superb Kaydara Mocap integration

Gypsy Gyro NEW
World's easiest, most accurate system

Gypsy Torso
Upper-body mocap
under \$5K

Gypsy 4
Full-body mocap
under \$20K

Motion Captor™ Optical System:
Easy — learn it in 4 hours. Up to 75% less cleanup
than other optical systems, thanks to automatic
biomechanical tracking. Unmatched dual-actor
capabilities. Awesome Kaydara Mocap™ integration.

Sapphire NEW
High-speed digital, increased
accuracy, easy expansion

Jade
Optical mocap
under \$45K

META⁺motion™
cgw84@metamotion.com
268 Bush St. #1, San Francisco, CA 94104

415-550-6382 metamotion.com



infoNOW 26

DongSool Shin; Daejeon, South Korea; *White 1*, 2003



**Visit us at
SIGGRAPH
Booth 1529**

**Savannah College
of Art and Design**
An International University for the Arts

Advertising Design · Animation · Architectural History · Architecture · Art History · Broadcast Design
Fashion · Fibers · Film and Television · Furniture Design · Graphic Design · Historic Preservation · Illustration
Industrial Design · Interactive Design and Game Development · Interior Design · Media and Performing Arts
Metals and Jewelry · Painting · Photography · Sequential Art · Sound Design · Visual Effects

Bachelor of Fine Arts · Master of Architecture · Master of Arts · Master of Fine Arts

Savannah, Georgia · 800.869.7223 · www.scad.edu

infoNOW 27

www.cgw.com

JULY 2004

Computer Graphics World | 75

Want to find out about video game schools? Do a credit check.



Joseph Gilland
Head of Department
2D Animation & Maya



Larry Bafia
Head of Department
3D Animation & Visual Effects



Robert Grieve
Head of Department
Sound Design for Visual Media



Stephen Webster
Head of Department
Interactive Media

Game Stream Programs at VFS

The game industry now leads the film industry in market share of the worldwide entertainment dollar. Growth is expected to be exponential. In Vancouver alone, thousands of jobs will be created over the next few years.

VFS has four programs designated and viewed by the industry as Game Stream Programs (GSPs): **2D Animation, Sound Design for Visual Media, 3D Animation & Visual Effects and Interactive Media for Communication & Game Design.**

To determine the appropriate game stream for you, call us to speak with an admissions advisor or visit us online at www.vfs.com.



Call Vancouver Film School now at

1-800-661-4101

www.vfs.com/credits

infoNOW 28



PennWell

YOUR
BIG
CHANCE
TO GET



Enter the World's Smallest Animation Festival contest and you could see your work appear on mobile phones. With 1.3 billion mobile phones in use now, that's a lot of play for your art! Plus, you could win **big name prizes**. The winner will be announced at SIGGRAPH in August at our booth #1455. The WSAF contest is sponsored by:



The Magazine
for Digital Content
Professionals

ComputerGraphics
World

Continued from page 80

beginning of the year. Moreover, our users made more than a quarter million transactions last month, buying and selling things from each other.

Q What are the demographics of players?

A Among active users, about 64 percent are male and 36 percent are female. The average age is in the late 20s, but there is a wider age range among people participating in *SL* than in typical online games. And all types of people are represented, from college students to home business owners to stay-at-home moms to digital artists. Some 20 percent of users are international, and more than 30 countries are represented.

Q Do people redo what they've done in real life or try new experiences?

A Both. There are lots of real-world businesses now being mirrored in *SL*, but they are much more exciting and rewarding to do because of the speed with which things happen in-world. For example, a clothing business might start and succeed or fail in days or weeks versus months or years in real life. Certainly, you can also use *SL* to become something you've never been. About half of the people create avatars that look a

lot like they do, and the other half go in a completely new direction.

Q What technology makes the experience possible?

A Streaming technology that delivers everything needed to render the world in real time over a broadband connection is the key to collaboratively creating and changing a rich visual environment. My background is in streaming media (with RealNetworks), and we borrowed techniques for streaming audio and video at high compression rates to stream the geometry, images, and sounds of a 3D world. We are also using a server grid computing model with more than 200 Linux-based computers that is expanding rapidly as we add land.

Q How far will this concept go?

A As the server computers get faster, it will be possible to put more objects in the world. Today, there are about one million user-created objects in *SL*. With 10 times the processing power, there could be 10 million objects. Within a few years, the visual quality and density of objects should be pretty close to a real-world environment. However, from an economic and emotional standpoint, I'd say it's already pretty real. For example, people are making a real-world living selling virtual things.

Q What are some of the potential benefits?

A *SL* is a fascinating tool for evaluating social systems. We've had college classes spend time in *SL* looking at sociological issues as part of their studies in game design, urban planning, architecture, and digital media. Some of the private islands that we sell will be test beds for folks who want to play with social rules. For example, we have one organization that has purchased a large private island to test



whether this type of environment would be effective for corporate communication.

Q Could it be used for evaluating policy issues?

A We've already experienced this in our own in-world policies. When our users felt the economic system was impeding their ability to enlarge and expand their projects, they had a tax revolt, and we were able to see the results of that. This sort of scenario could be useful for examining the effects of real-world governmental policies, as well.

Q Are there dangers in living fantasy lives?

A The early stages of online environments have simplified the world in a way that invites a dangerously simplified perspective—the idea that you can shoot your way out of any problem, for example. But as digital worlds offer capabilities beyond the real world, we will actually see the opposite—an ability to become better people by being there. A number of participants have told me that, in addition to simply being fun, *SL* has made them better or smarter. This is one of the things that inspires me about *SL*. ■■



ComputerGraphics World

The Magazine for Digital Content Professionals

WEBCASTS

PennWell

NEXT GENERATION GRAPHICS TECHNOLOGY WEBCAST SERIES

NOW ARCHIVED FROM THE
JULY 13, 2004 LIVE EVENT

Part One: *Trends in graphics board technology*

Part One of our series will look at the next generation of graphics boards. Our expert panel features Alex Herrera and Jon Peddie of Jon Peddie Research. Citing their newly completed "Workstation Report: Professional Computing Markets and Technologies," Herrera and Peddie will examine what the new graphics board technology entails, how it differs from last-generation offerings, and what it will mean for graphics developers and users.

Webcasts are completely interactive and **free**. Viewers have the opportunity to ask questions in real-time, and receive immediate answers. We also poll the viewers as to their reaction to various solutions and interests. Viewers must register to attend.



GRAPHICS BOARD
WEBCAST

Coming in July

Trends in Graphics
Board Technology

**To register and for
more information,
on this live,
interactive event,
visit www.cgw.com**

Sponsored by:



advertiser	phone or web	page	RS
3D Labs	www.3dlabs.com	68, C4	46, 32
Academy of Art University	www.academyart.edu	53, 74	—
AJA Video Systems	www.aja.com	10	5
Alias Systems	www.alias.com	7	3
Anthro	www.anthro.com	17	—
Appro Systems, Inc.	www.appro.com	12	7
Arena-Maxtronic, Inc.	www.maxtronic.com	19	10
ART VPS	www.artvps.com	27	13
ATI Technologies Inc.	www.ati.com/firegl	13, 49	8, 36
Avid Technology, Inc.	www.avid.com/tour	72	21
Computer Graphics World	www.cgw.com	76, 78	—
Computer Graphics World	www.bigdigit.com/wsat/	44	—
Ciara Technologies	www.vxrack.com	33, 57	15, 40
Cyberware	www.cyberware.com	35, 61	16, 42
Discreet	415-547-2000	3, 65	2, 44
Eyeon Software	www.eyeonline.com	41, 63	17, 43
IBC 2004	www.ibc.org	71	—
nPower Software	858-538-3083	75	25
Iomega	www.iomega.com	29	14
Meta Motion	www.metamotion.com	75	26
NewTek, Inc.	www.newtek.com	C2, 46	1, 34
NVIDIA	408-486-2000	9, 59	4, 41
Okino Computer Graphics, Inc.	http://www.okino.com	74	23
Oregon 3D	www.oregon3d.com	43	18
Savannah College of Art and Design	www.scad.edu	47, 75	35, 27
SIGGRAPH 2004	www.siggraph.org/s2004	73	—
SOFTIMAGE	www.softimage.com/nab	67, C3	—
Stratasys Technology	www.dimensionprinting.com/sig	51	37
Stratasys Technology	www.dimensionprinting.com/cgw	21	22
Vancouver Film School	604-685-5808	76	28
Verari Systems	www.verari.com	11, 55	6, 39
ViewSonic Corporation	800-888-8583	25	12

The ad index is published as a service. The publisher does not assume any liability for errors or omissions.

advertising sales offices

Group Publisher

Mark Finkelstein
TEL: 603-891-9133
FAX: 603-891-9297
E-MAIL: mark@pennwell.com

Associate Publisher

Randy Jeter
1150 Lakeway Dr.
Ste. 217
Austin, TX 78734
TEL: 512-261-1998
FAX: 512-261-7915
E-MAIL: randyj@pennwell.com

Reprints

Carol Woodward
98 Spit Brook Rd.
Nashua, NH 03062-5737
TEL: 603-891-9157
FAX: 603-891-9409
E-MAIL: carolw@pennwell.com

List Rental

Bob Dromgoole
98 Spit Brook Rd.
Nashua, NH 03062-5737
TEL: 603-891-9128
FAX: 603-891-9341
E-MAIL: bobd@pennwell.com

United Kingdom

Amanda Loftus
TEL: 44-1793-641571
FAX: 44-1793-610001
E-MAIL: amandal@pennwell.com

France

Luis Matutano
TEL: 33-1-47-91-70-11
FAX: 33-1-55-02-03-85
E-MAIL: luism@pennwell.com

Germany

Holger Gerisch
E-MAIL: holgerg@pennwell.com
and
Johann Bylek
E-MAIL: johannb@pennwell.com
TEL: 49-89-904-80-144
FAX: 49-89-904-80-145

India

Rajan Sharma
TEL: 91-11-2686113/14/
26865103/26861758/
26861766861113
FAX: 91-11-26861112
E-MAIL: rajan@interadsindia.com

Korea

Paek Kwon
TEL: 82-2-420-1293
FAX: 82-2-420-1294
E-MAIL: keskor@kornet.net

Japan

Akiyoshi Kojima
TEL: 81-3-3261-4591
FAX: 81-3-3261-6126
E-MAIL: kojima@media-jac.co.jp

Taiwan

Teresa Fu
TEL: 886-2-8771-9388
ext. 240
FAX: 886-2-8773-7066
E-MAIL: Teresa_Fu@acertwp.com.tw

Hong Kong & China

Adonis Mak
TEL: 852-2-838-6298
FAX: 852-2-838-2766
E-MAIL: adonism@actintl.com.hk

Singapore

Joanna Wong-Monis
TEL: 65-6836 2272
FAX: 65-6735 9653
E-MAIL: jwong-monis@publicitas.com

Director, Internet Services

Tom Cintorino
TEL: 603-579-9002
FAX: 603-579-9030
E-MAIL: tomc@pennwell.com

For a direct link to product information, vendor Web sites, and subscription information, click on:

www.onlinecenter.to/cgw

July 2004, Volume 27, Number 7: *COMPUTER GRAPHICS WORLD* (USPS 665-250) (ISSN-0271-4159) is published monthly (12 issues) by PennWell Corporation. Editorial & Production offices at 98 Spit Brook Rd., Nashua, NH 03062-5737. Corporate officers are Frank T. Lauinger, Chairman; Robert F. Biolchini, President & CEO; Adam Japko, President & COO, Advanced Technology Division; and Mark C. Wilmoth, CFO. Corporate offices: 1421 South Sheridan Road, Tulsa, OK 74112, Tel: 918-835-3161; FAX: 918-831-9497; Web Address: <http://www.pennwell.com>. Periodicals postage paid at Tulsa, OK 74112 & additional other mailing offices. *COMPUTER GRAPHICS WORLD* is distributed worldwide. Annual subscription prices are \$55, USA; \$75, Canada & Mexico; \$115 International airfreight. To order subscriptions, call 847-559-7500.

© 2004 CGW by PennWell Corporation. All rights reserved. No material may be reprinted without permission. Microfilm copies are available through University Microfilms Inc., Ann Arbor, MI 48106, Tel: 313-761-4700. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by *Computer Graphics World*, ISSN-0271-4159, provided that the appropriate fee is paid directly to Copyright Clearance Center Inc., 222 Rosewood Drive, Danvers, MA 01923 USA 508-750-8400. Prior to photocopying items for educational classroom use, please contact Copyright Clearance Center Inc., 222 Rosewood Drive, Danvers, MA 01923 USA 508-750-8400. For further information check Copyright Clearance Center Inc. online at: <http://www.copyright.com>. The *COMPUTER GRAPHICS WORLD* fee code for users of the Transactional Reporting Services is 0271-4159/96 \$1.00 + .35.

POSTMASTER: Send change of address form to *COMPUTER GRAPHICS WORLD*, P.O. Box 3296, Northbrook, IL 60065.

RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: P.O. Box 1632, Windsor, ON N9A 7C9

backdrop

Interview by Editor-in-Chief
Phil LoPiccolo

Fantasy World

3D graphics and streaming technologies enable users to create an alternate reality that may enhance their real lives



Philip Rosedale, CEO of Linden Lab, is the chief visionary for Second Life, an online 3D world that allows visitors to live their dreams virtually. For more information about Second Life, see "Life, Or Something Like It," page 54.

Q How would you describe Second Life?

A It's an immersive 3D world owned by its users—a place where you can change everything, and create or experience anything you can imagine. Buy and sell land, build a real business, design cars, play games, go dancing—these are all possibilities.

Q Is it a game?

A Second Life is more than a game. It's a living, growing, digital world. And as participants add attractions—like theme parks or charity events—it will become more like another country you can visit with a computer. Yet, because its early pioneers often

build virtual businesses that provide entertainment to others, it often feels like many games within a broader open platform or playground.

Q How did the idea originate?

A I've been intrigued since an early age by the possibility of using networking and computers to create a special kind of space between people that captures our passion to communicate, express ourselves, and pursue our dreams.

Q Why hasn't this been done before?

A Bandwidth and 3D capabilities haven't been sufficient for doing something compelling until now. I actually started the company in early 2000 figuring that it would take a few years to create the product and have it ready for today's enabling technologies.

Q Are you tapping into the desire people have to remake themselves?

A Remaking one's identity is only the tip of the iceberg of what digital worlds can offer. We all share a tremendous passion to express ourselves and an inability in real life to do it as well as we would like. By creating an exceptionally plastic environment in which you can change everything from yourself to your home or your car

or anything else in your environment, SL can be the closest thing to having someone else be able to see inside your head.

Q Why did you create a world where nonviolent behavior is rewarded?

A SL is actually neutral with respect to violence, as opposed to most MMORPGs, which reward violent behavior as part of a heroic narrative. In SL, a strong sense of community is created during the process of building a new world, in engaging in the debate over what the future will look like. But there are many struggles in SL as well—over land or between neighbors, for example.

Q How is positive behavior encouraged?

A We created forms of transparency like ratings and social networks that tend to encourage positive behavior, but I'd say these are emergent characteristics more than intentional design. I think we are seeing a trend in the real world as well toward higher levels of transparency, which will probably also result in better overall human behavior.

Q How popular has SL become?

A We are still small relative to the big consumer MMORPGs, but SL has been growing at almost 30 percent per month since the

Continued on page 77



softimage.com

SOFTIMAGE | XSI®

Announcing version 4.0

Superior engineering. Visionary architecture.
Never before has a software solution been so open and so flexible. **SOFTIMAGE | XSI** version 4.0 is completely customizable, offering unmatched access to the core of the software and giving unparalleled control over a dramatically accelerated creative process.

i am 4. the future of animation.

Available online at store.softimage.com from \$1,995^{USMSRP}

© 2004 Avid Technology, Inc. All rights reserved. All prices are USMSRP for the U.S. and Canada only and are subject to change without notice. Contact your local Avid office or reseller for prices outside the U.S. and Canada. SOFTIMAGE, Avid, XSI, and make manage move | media are either registered trademarks or trademarks of Avid Technology Inc. in the United States and/or other countries. All other trademarks contained herein are the property of their respective owners.

Come see us at Booth #1547

Avid

make manage move | media®

A New Twist On Reality

Introducing



WILDCAT
REALiZM™

Welcome to reality with a twist . . . where you don't compromise creativity because of slow, inflexible graphics hardware. Introducing 3Dlabs® Wildcat® Realizm™ - a family of programmable graphics accelerators that's so advanced, it's more than next-generation good. It's like we reinvented graphics technology and gave it a whole new name. With optimum, real-world application performance and the industry's newest and most advanced visual processing right at your fingertips, animations, intricate CAD models, or complex scientific visualizations are rendered as you imagine them - in real time - with Wildcat Realizm.

***Remove the Boundaries...
Realize Your Potential***

www.3dlabs.com

Features:

- Wildcat Realizm 100 and 200 support AGP 8x
- Wildcat Realizm 800 supports 16x PCI Express
- Flexible floating-point visual processing
- Industry's largest amount of onboard memory
- New-generation framelock/genlock support

3Dlabs®

A CREATIVE® Company

infoNOW 32 at www.onlinecenter.to/cgw