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Crossing Over

Next-generation music videos transcend
the familiar art form

Cinematic Gaming
*Film wizards work
their magic in games*

Stylized Realism
*Birthday Boy gets
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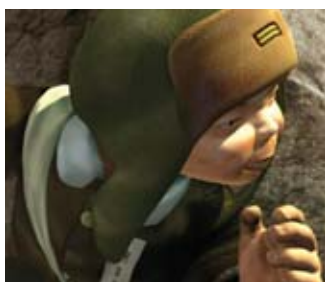
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Also see www.cgw.com for computer graphicsnews, special surveys and reports,
and the online gallery.

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Cover story

By Karen Moltenbrey

Visual Notes - Part 2 10

Digital artists are creating music videos that take the now-familiar art form into uncharted realms. Part two of our series looks at hybrid works that cross traditional boundaries and adopt techniques from the following genres:

CINEMA | Robb Roy's *What If* adapts a classic film noir style from yesteryear.

THEATER | Will Young's *Your Game* upstages Broadway's big production numbers.

SHORT FILM | Blazique's *I Tiki U* showcases timeless storytelling techniques.

ART | Laurence Gartel's *Trance/Dance* exhibits a spectrum of digital art.

GAMES | Cold's *With My Mind* integrates video game-style CG animation.

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GAME | Oscar-winning artists apply tried-and-true techniques from film to the world of gaming.

By Barbara Robertson

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SHORT FILM | Voted Best Short at SIGGRAPH, "Birthday Boy" lends a new style to character animation.

By Jenny Donelan

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Kevin Carrico crafted this digital man of mystery to star in the brooding music video *What If* from rock band Robb Roy. For more information, see pg. 10.





**Karen
Moltenbrey**
Senior Technical
Editor

Music Video Hybrids

It's obvious that video hasn't killed the radio star, as foretold by the Buggles in the band's song that kicked off the age of music television. But lately it seems that video isn't doing the radio star any favors, either, at least judging from the general content appearing on music television channels such as MTV and VH1.

For the most part, today's videos have hit a sour note, consisting of little more than rough-cut footage of a band's performance mixed with gratuitous shots of sexy women vamping for the camera—hardly the artistic statement videos were making during the early days of music television.

Meanwhile, our visual palates have grown more sophisticated as we continue to experience the smorgasbord of inventive imagery available through other entertainment mediums such as films, computer games, and television programs and commercials. Indeed, our tastes have evolved to the point where we no longer tolerate being served plain-vanilla videos that lack storytelling, emotion, or imagination. Audiences are hungry for videos with a unique visual flavor, like OutKast's *Hey Ya!*, Britney Spears's *Toxic*, and Jay-Z's *99 Problems* (see "Visual Notes" Part 1, August 2004, pg. 32, and Part 2, this issue, pg. 10). Though in the minority, these are the kinds of videos that are getting rave reviews, not only winning industry awards but, perhaps more important, also receiving a generous portion of airtime.

While projects like those are stirring the creative pot, others are going a step further and redefining the music video art form as we know it. Using a unique combination of cutting-edge computer graphics and inventive in-camera techniques, these vanguard offerings—for example, Robb Roy's *What If* music video, with its cinematic film noir style, and Will Young's *Your Game*, with its grand theatrical stage sets—are crossing over into other entertainment genres.

Clearly, the medium is ripe for change. And there's no better time than now for directors and visual effects artists to set a new tone, and there's no better way to

achieve this than with digital techniques. The CG and video tools are robust, affordable, and widely available, and the talent is experienced and eager, as their work on television and film projects has whetted their appetite for creating amazing imagery and effects.

Treating music videos as a main-course art form rather than a light appetizer has a number of benefits. For instance, it will give artists a chance to showcase their talent, a valuable opportunity given that in a recent survey by graphics research firm TrendWatch, nearly half of the studios creat-

ing music videos say their clients don't realize the extent of their creative capabilities. Furthermore, as the creative value of music videos increases, so does the likelihood of extending the projects into other outlets and venues, among them movie theaters, playing alongside film trailers, and in retail outlets as DVD releases.

Effects studios and postproduction facilities estimate that approximately 15 percent of the overall work they plan to do this year will be for music videos. It's time for them to use this opportunity to add creative spice to the music video mix and produce something new and exciting. #

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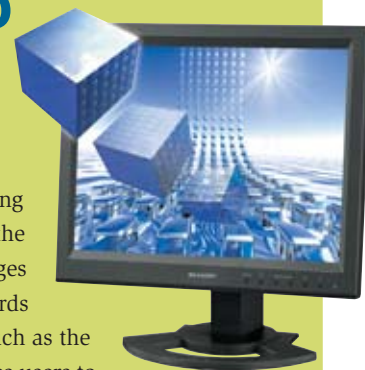
During SIGGRAPH 2004 in Los Angeles last month, Sharp Systems of America unveiled its first stand-alone display based on the company's TFT 3D LCD technology.

Well suited to several applications, including gaming, entertainment, education, and design, the Sharp LL-151-3D desktop display delivers 3D images to the naked eye. When paired with graphics cards that support OpenGL 3D displays with glasses, such as the Nvidia Quadro series, the Sharp LL-151-3D enables users to view 3D content, without the need for shutter glasses. And with the press of a button or using the device's USB-based automatic switching feature, users are able to toggle quickly and easily between 2D and 3D viewing modes.

Sharp's latest display innovation features a 15-inch XGA LCD panel, which offers 1024x768 resolution, 370-nit brightness, and a 500:1 contrast ratio. Housed in a black enclosure, the Sharp LL-151-3D sports analog and digital video inputs, built-in stereo speakers, a narrow frame, and an adjustable height. Its slide system height adjustment enables users to swivel the unit up to 90 degrees. A long-life backlight, suitable for roughly 50,000 hours, and a software bundle including the Sharp SmartStereo Photo Editor and Sharp SmartStereo Camera Calculator round out the new LCD display.

The Sharp LL-151-3D is available now at an estimated price of \$1499. —Courtney E. Howard

■ **Sharp;** www.sharp.com
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workstation
products

Verari Systems Unveils NemeSys X64

Verari Systems, formerly RackSaver, recently introduced SIGGRAPH attendees to the latest model in its family of NemeSys professional workstations, the NemeSys X64.

Targeted at digital content creators in the film-making and game-development markets, the NemeSys X64 dual-processor workstation incorporates 64-bit Intel Xeon processors, as well as Intel Extended Memory 64 Technology and a high-performance graphics card from Nvidia that delivers the newest PCI Express graphics interface. The company's latest innovation is further enhanced by an attractive, new enclosure design, capable of housing up to six hard drives and a full 1.5TB of storage capacity. Now available, custom configurations of the NemeSys X64 begin at \$3400. —CEH

■ **Verari Systems;** www.verari.com
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3D animation
products

NewTek Releases LightWave 8

NewTek has upgraded its LightWave 3D animation software for film, broadcast, print, game development, and Web development to Version 8.

Adding to the production program's modeling, animation, and rendering capabilities, NewTek LightWave has been infused with new character animation tools and dynamics. Its character animation system has gained faster inverse and forward kinematics, improved setup and control of character animation, and the ability to cut, paste, and adjust hierar-



Sun Microsystems Expands Workstation Offerings

Sun Microsystems has launched two new professional products, the Sun Java Workstation W1100z and W2100z. Designed to maximize productivity, the Sun Java Workstation W1100z and W2100z are 64-bit systems based on AMD Opteron processors and Nvidia's graphics technology. Both the W1100z and W2100z mini towers support simultaneous 32- and 64-bit computing.

Developed for digital content creation professionals, the Sun Java Workstation W1100z boasts a single 100-series AMD Opteron processor, five PCI-X slots, USB 2.0 and IEEE1394a ports, and onboard Gigabit Ethernet. As well as an integrated dual-channel memory controller for a maximum of 8GB of PC3200 registered ECC memory, the W1100z supports up to two 80GB Ultra ATA100 internal hard drives and Nvidia's AGP-based graphics accelerators, including the Quadro FX3000, FX1100, FX500, and NVS280.

The dual-processor Sun Java Workstation W2100z incorporates two 200-series AMD Opteron processors, as well as five PCI-X slots, USB 2.0 and IEEE1394a ports, and onboard Gigabit Ethernet. For digital media entertainment applications, the W2100z sports an integrated dual-channel memory controller with support for up to 16GB of PC3200 registered ECC memory. Support for Nvidia's AGP-based graphics boards and as many

as two 73GB Ultra-320 SCSI internal hard drives.

Sun's new systems ship with the latest edition of the Java Desktop System running on the Solaris 9 HW 4/04 (x86 Platform) or Red Hat Enterprise Linux WS 3.0 operating systems. The Sun Java Workstation W1100z and Sun Java Workstation W2100z are both shipping now in configurations starting at \$1995 and \$4695, respectively. —CEH

■ **Sun Microsystems;** www.sun.com
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Leitch Announces VelocityQ 0x4

Leitch Technology has amended its family of award-winning VelocityQ multi-stream, non-linear editing systems with an entry-level model, the VelocityQ 0x4.

The new standard-definition postproduction editing system combines the company's Velocity software and Quattrus multi-stream, real-time hardware. VelocityQ 0x4 offers real-time, full-quality playback of four streams of video, compressed and uncompressed, and up to six graphics streams. Additional features include integrated four-camera multicam editing, 3- and 4-point editing, real-



time filters, and customizable, real-time transitions. The system's Virtual Tape File System enables it to function as a digital disk recorder or graphics output platform. The VelocityQ 0x4 software and board bundle is priced at \$4995. —CEH

■ **Leitch Technology;** www.leitch.com
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chies quickly and simply. With the new ability to import and export character rigs, users can apply rigs to new meshes more easily.

NewTek not only added rigid-body dynamics, but also enhanced the cloth and soft-body dynamics utilities in LightWave. New cloth features enable users to tear or separate sections in response to dynamic events. Moreover, dynamics now can be applied to character skeletons as well as meshes. Work flow enhancements include a new scene editor with spreadsheet and dopesheet, a dopetrack view, and a node-based expression editor. Modeling is improved with the addition of various edge tools and filleting and chamfering via a new Rounder tool.

Now shipping, LightWave 8 carries a suggested retail price of \$1595. Registered users of LightWave 3D Version 7.5 can purchase the LightWave 8 Electronic Upgrade Pack at a cost of \$495. —CEH

■ **NewTek;** www.newtek.com
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Virtual Restoration

One of the most stunning animations premiering in the Electronic Theater at SIGGRAPH 2004 was a computer graphics tour de force, titled "The Parthenon," which, in two and a half minutes, visually restores to its original glory the ancient Greek monument that has stood at the head of the Athenian Acropolis for two and a half millennia.

The film—created by a team led by Paul Debevec, executive producer of graphics research at the Institute of Creative Technologies (ITC) in Los Angeles and research assistant professor at USC—applied new techniques to reassemble and renew the Parthenon, considered to be one of the world's most architecturally refined structures.

Constructed in 432 B.C. as the temple to the goddess Athena, the Parthenon has been damaged by wars and the elements over the centuries. Adding insult to injury, most of the classical statues and sculptures decorating the monument were removed in the early 1800s and placed in the British Museum, where they remain on display today.

To create CG models of the sculptures, Debevec's group developed a 3D scanning system consisting of a standard 1024x768 video projector and a 1kx1k video camera. With



Images © 2004 USC. Courtesy Paul Debevec.

To create this photoreal scene of the Parthenon, Paul Debevec's team applied several novel modeling and rendering techniques.

the device, researchers captured 2200 scans, accurate to approximately 1mm, which they assembled into precise models. Next, they employed a 3D laser scanner, taking some 120 panoramic scans of the Parthenon and collecting more than six billion point measurements, which were assembled into a 90-million polygon model.

Once the CG models were completed, the team devised a novel method of generating accurate color texture maps that overcomes the shortcomings of traditional techniques. Rather than simply using digital photographs—which record surface

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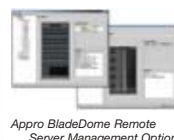


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colors only as they appear under lighting conditions that can vary widely according to cloud cover, time of day, shadows, and so forth—the researchers recorded precise lighting measurements as they took each photo. The readings were taken with a new “light probe” device from Debevec’s group that measures the incident illumination—that is, all the light arriving at a given point, including direct light from the sun as well as indirect light from the sky, clouds, and ground.

Using this data, the group applied an inverse global-illumination technique to “un-light” the photographs and reveal the true colors of the temple’s surfaces.

Another advantage of the approach is that the results can also be used to re-light and render the virtual scene under any desired illumination. So, rather than waiting in Greece to capture lighting with a desired combination of clouds and sun, the team returned to Los Angeles and recorded illumination from



When taking digital photos of the Parthenon, the researchers simultaneously captured precise incident-illumination data using a new “light probe” device.

the roof of the ITC using High Dynamic Range process imaging. According to Debevec, the new HDR technique is the first to directly capture the full dynamic range of natural illumination—from the dark predawn sky to the brilliant light of the midday sun—a range of more than 100,000 to one. The researchers then used the results to create the time-lapse lighting in their final renderings of the Parthenon.

In “The Parthenon” animation, the lighting appears photoreal, even as the intensity of the illumination changes—moving from cloudy to sunlit during the rapid time-lapse effects—and as the virtu-

al camera moves through the digital models of the Parthenon and the British Museum.

During the short film’s climactic sequence, after the statues return to their original condition and location and the long-lost pieces of the monument are refitted, the camera pulls back to reveal in dazzling color and detail how the Parthenon may have appeared when it had first been built. —Phil LoPiccolo



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From over 60 entries, the panel has awarded two prizes: the Mobile Animation Award to

Eric Petajan for 'Radio Face'; and the Mobile Art Award to Patrick Burke for 'Onadime People'. Congratulations are extended to all of the entrants.

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PART 2

of a two-part series

Visual

In 1981, the debut of Music Television (MTV) helped spin the obscure music video medium into a new entertainment genre. Initially, innovation was relatively easy to achieve, as nearly every type of visual element was deemed inventive because it simply had not been done before. During the past two decades, the art of creating a music video has definitely evolved, as music videos have run the creative gamut, from novel to controversial, to unfortunately, blasé. • Last month, in Part 1 of this series, we examined cutting-edge projects that, through imaginative CG and video techniques, are raising the bar for music videos higher than ever. And this month, in Part 2, we look at digital artists who are taking the art form ever further by creating groundbreaking CG imagery and innovative video sequences that borrow the best techniques from other entertainment genres, including cinema (*What If*), theater (*Your Game*), short film (*I Tiki U*), art (*Trance/Dance and Other Living Things*), and computer games (*With My Mind*). As a result, these novel hybrids are redefining music videos and breathing new life into the medium.

Notes

Digital art heralds a new generation of music videos

By Karen Moltenbrey

- **Cinema**
- **Robb Roy's**
What If

When it comes to creating music videos, there is no chicken-and-egg quandary; the music, rather than the video, is conceived first. However, this linear process became scrambled for the Detroit-based rock band Robb Roy's *What If*. Instead of the band seeking a partner to generate the accompanying imagery to its song, in this case, it was director and digital artist Kevin Carrico who approached a band member, pitching a visual concept he believed was in harmony with the band's lyrics and melody.

For some time, Carrico longed to incorporate a cloak-and-dagger story line along with a black-and-white film treatment into a project, but had little opportunity to do so—that is, until he heard *What If*. With its moody tone, the song became Carrico's muse, as he created a visual story of emotional depth that unfolded in a classical motion-picture fashion.

Carrico interpreted the song as a plea to belong and be accepted. To him, the ultimate state of not belonging is not being alive or real, and a character that best exemplifies that is a doll, like Pinocchio. "I started thinking how lonely it would be know-

ing you can never belong, and this became my starting point," he says.

Over the course of a year, Carrico worked with the band to distill the essence of the song into a series of visual sequences whose style resembled that of films from the 1960s. In particular, he used an ominous film noir treatment, enhancing the soulful song through the use of contrasting black-and-white imagery.

The result is a portrait of loneliness, told through the visualized thoughts of a modern super spy. "I wanted a Stanley Kubrick *Dr. Strangelove* look blended with a silent-

film style," says Carrico.

Surprisingly, rather than creating this retro film design through cinematography, Carrico achieved it using state-of-the-art computer graphics, including 3D animation, a digital character, and virtual sets. "This is not a style you typically see in 3D animation," Carrico points out. "However, it's a look I've always liked, and I've wanted to do a project

of this artistic level for a while." Directing brightly lit, product-focused television commercials didn't allow him that opportunity, nor did any of the other pop-rock music videos he had previously produced. "I wanted to break out of those molds with an idea that was off-center from the norm."

Carrico would have done so by building physical sets and then filming the action if given an unlimited budget. But the reality was that he was working with limited funds. Being in the unusual situation of having both digital artistry and directorial experience, Carrico knew he



The imagery in *What If* is computer-generated, with a few exceptions, including video of the band members (appearing here on the monitor), which was shot with a Sony 24p camera, whose crisp format maintains a cinematic quality and composites well with the CG.

•••• Music Videos

could achieve his cinematic storytelling through the use of digital tools and techniques. And the extent to which he could rely on CG was even more apparent to Jon Synnестvedt, Carrico's founding partner at 3D animation boutique Skylight Digital Images.

"I started laying out the video in [NewTek's] LightWave as an animatic, thinking I'd film a large part of the action in HD and composite the video into synthetic sets," Carrico recalls. "But the more I discussed this with Synnестvedt, the more he convinced me that we should do most of the work in LightWave."

Image-Based Reality

In the end, all the imagery became computer-generated, with three exceptions, two of which appear on a bank of video monitors (which are 3D models) in a sequence reminiscent of the war room scene from *Dr. Strangelove*. One segment includes clips of the band members, who were filmed with a Sony HDW-F900 24p camera.

That footage is interspersed with shots of another live performance in what appear to be home movies that the main character (who is 3D) begins watching. These video sequences—depicting the character's thoughts and imagination—feature real actors, whom Carrico filmed with a Panasonic AG-DVX100 mini-DV camera. Later, he processed the footage so it would resemble grainy Super 8 film from the 1960s.

The last live segment, shot in HD, immediately follows the home-movie segments. In it, Roy imagines himself celebrating something only a real person has: a birthday.



Director Kevin Carrico used a bleak film noir style for *What If*, with stark lighting and obscuring, deep shadows, along with integrated fog and silhouettes.

"It's unclear if the movies are scenes from the character's past or just scenarios he longed to experience but never did," explains Carrico. "But in the final shot, you discover that the guy is not real, but a toy from a spy kit, wishing it were alive."

The use of color, in addition to establishing an overall mood, also played a major part in the storytelling, especially in the "war room" sequences. Carrico used black and white throughout the video, but when the character sees himself as real in the birthday party segment—his perceived reality—the director applied color, although that eventually fades once Roy realizes his situation.

Key to pulling off the surprise ending was the integration of a

digital character that looked like a real person, but not so real as to contradict the story ending. Handling this particular modeling mission was Synnестvedt, who referenced photographs of the character's live counterpart in the home movies while constructing the digital double. To make the model more authentic, both he and Carrico applied photographic textures with Right Hemisphere's Deep Paint 3D, and used Worley Labs' Sasquatch hair-simulation tool for the character's locks.

To ensure that the model moved as lifelike as it looked, Synnестvedt used Kaydara's MotionBuilder to apply motion-captured data, provided by mocap studio Motek, to the model. Afterward, he and Carrico were taken aback at the overall realism of the CG character. In fact, at times it looked too real for the story line, requiring Synnестvedt to cut out some of the more believable action.

Like the main character, the sets are virtual as well, built in LightWave and textured with Corel's Photo-Paint. And Carrico doesn't regret going digital for that task, either. "Had I used video, I would have been committed to certain camera angles or camera distances, or I'd have to reshoot the scenes," he says. "With CG, I was able to control all the variables."

Cinematic 3D

Nevertheless, Carrico admits that despite his familiarity with computer graphics, it still was difficult, as a filmmaker, to embrace the medium for achieving photorealistic character performances. But he changed his tune halfway through the project when he realized that nearly all of the scenes up to that point had been done digitally instead of being shot live. "There were parts I was hard-set on filming, but once we figured out how to do it in CG, we were able to do it faster and cheaper," he says. "After that, I kept asking if there was anything else we could do in CG, because I was finding that I had more control retaining the cinematic look, and that was very important to me. Digital tools enable you to be not only extremely photorealistic, but extremely artistic as well."

Achieving this cinematic style in LightWave, however, required experimentation with filters and software plug-ins to eliminate the typical "electric, self-illuminating" look that is a computer graphics hallmark. These programs included Evasion 3D's Shadow Designer for controlling the shadows that were vital to the video's theme, and DigiEffects' Cinelook and Delirium tools for a film-stock look. "I didn't want even one frame to look CG," says Carrico. "Even though there are some modern references in the video, I wanted it to look like the sequences were shot in the '60s. Moreover, I wanted it to be one of those atypical examples of 3D that you see now and again, usually in animated short films from Europe."

Without a doubt, *What If* pushes the state of the art in music videos with its cinematic and storytelling appeal, so much so that Carrico describes the project as a music-based short film. Unfortunately, Carrico has had to find outlets other than MTV for this offbeat project, one of which is the Web. "Ironically, the video and song are about fitting in," Carrico says, "but the video itself doesn't exactly fit into the typical music video world."

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•••• Music Videos

● Theater

● Will Young's *Your Game*

The dazzling stage sets—with extensive cityscapes, modern dancers, a high-kicking chorus line, a swaying gospel choir, and singers and dancers dressed in period costumes—look like scenes from a major Broadway musical. In one instance, the sequences resemble *Chicago*, in another, *42nd Street* or *Wonderful Town*. Surprisingly, they're none of these, but rather a music video by Australian-based Babyfoot Productions for international production facility Partizan London.

The video, showcasing *UK Idol* winner Will Young and his new single *Your Game*, is broken up into a series of increasingly elaborate stage sets that are presented in rapid-fire rotation, starting with a single spotlight focused on the stage and eventually transitioning to 350 dancers stepping their way across a seemingly enormous set. Incredibly, none of the segments are repeated through the production.

"The entire video clip pays homage to a number of MGM musicals, but with a digital twist," says Mike Seymour, visual effects supervisor at Digital Pictures, which generated the effects and composited them into the video for its client, Babyfoot Productions. "As with all musicals, choreography is at the heart of the production, and in the video, we blended traditional big-production numbers with an edgy modern aesthetic that was achieved using state-of-the-art effects."

The scenes are ambitious for any stage production, let alone a music video, especially one for a newly crowned pop artist. But with *Idol* fever running high worldwide, producers wanted Young, and his video, to get the ultimate star treatment. In fact, one constraint imposed by directors Michael Gracey and Peter Commins of Babyfoot Productions was that the grand-scale effects could not upstage the vocalist. "Because of this, many of the most spectacular shots appear on screen for only a moment," says visual effects supervisor Peter Webb, "but long enough to leave the audience wanting more."

Stage Right

Using high-quality 35mm film rather than more economical video, director of photography David Wakley shot the live action over a four-day period. Later, the film was transferred into a digital format for editing and compositing, at which point the group retained the cinematic quality of the 35mm format by finishing the project in uncompressed HD resolution rather than the lower-quality SD that's typically used for music videos.

In keeping with the majestic look and style of the production, the historic State Theatre in Sydney, Australia, served as the main set locale. However, as the scenes in the video progressed, digital

artists had to extend the Theatre well beyond its structural walls. Commins achieved this by creating extensive CG matte paintings with Discreet's 3ds max and Corel's Painter. Then, before the film shoot, he printed the bottom portion of the mattes and used them as large set pieces measuring approximately 36 feet wide by 10 feet high. This, in turn, allowed Wakley to take close-up and mid-range shots of Young and the dancers against the partial backgrounds. Moreover, the CG artists were able to use the shadows and reflections on the set pieces as reference points for digitally extending the backgrounds in postproduction.

Later, the compositing teams used Discreet's Flame and Inferno as well as Apple's Shake to integrate 3D and live-action elements



Your Game uses enormous, elaborately detailed backdrops, created as CG matte paintings, to provide a theatrical feel to the music video.

with the CG mattes, including more than 350 actors and actresses who were filmed against greenscreen and added to the base plate. The background, meanwhile, was enlarged sevenfold, to a height of more than 82 feet, to support the project's elaborate design.

All told, well over half the project features digital video and CG effects. The most ambitious of these appear in a *Chicago*-inspired sequence in which dancers move in sync with the cars of a CG train that thunders across the stage on an overhead bridge. Using 3D, the digital team previsualized this complex action to resolve a number of issues, among them how fast the dancers needed to traverse the stage in the time allotted. Later, on set, the directors viewed the CG composites to judge the pacing, timing, and the speed of the performances.

The constantly evolving array of backdrops and cast members reaches a crescendo in the final sequence, which transitions from 150 dancers to a pullout shot from the back of the State Theatre. Next, the camera pulls back even further, moving out of the building and through a virtual cityscape dotted with theatrical neon signs that grow more distant in the background. Then, it zooms in again, eventually focusing on a dimly lit stage. Only instead of Young standing in the spotlight, as he did in the opening, there's a janitor who, after a last swoosh of his broom, turns out the lights.

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•••• Music Videos

● Short Film

● Blazique's

I Tiki U

What happens when two creative artists/designers have a little free time on their hands? If it's the husband and wife team of Steven and BenniQue Blasini, partners in the visual effects boutique BFX Imageworks, they create a music video—and a song to go with it.

Indeed, the Blasinis wrote the lyrics, composed the score, and performed and recorded the song under the fictitious band name Blazique. For a second act, the couple filmed and edited hours of video footage—starring themselves, of course—then created computer-generated imagery and digital effects that they later added to the video. For an encore, they received a Videographer Award and a Telly Award, given to outstanding television, video, and film productions.

"The project, called *I Tiki U*, began one day when I, being of Spanish descent, told my wife, 'Te quiero,' which means 'I love you' in Spanish," explains Steven. "BenniQue, who is obviously not Spanish, replied, 'I tiki U, too.'" Over the next year and a half, during downtime between feature-film projects, the couple turned that personal joke into the award-winning music video that tells the story of their whirlwind romance through the use of live action and computer graphics. The video begins with stunning shots of the couple performing amid the blaze of a setting sun. Then, reflective of the humor that initiated the project, it transitions to light-hearted segments of the duo in various costumes and an animated sequence of themselves as "bubblehead" cartoon characters.

"I think so many music videos today lack a story element," says BenniQue. "In contrast, *I Tiki U* is more like a short story; it has a beginning, a middle, and an end."

Foremost, the video served as a creative diversion for the artists, who at times found themselves so immersed that they would work on the project for 12 to 18 hours straight without realizing it. "We need to be creative all the time," says Steven of the passion that drives the couple. He also used the project as a learning tool, familiarizing himself with a new Panasonic AG-DVX100 24p camera he had just purchased.

With camera in hand, the couple took to the road, shooting at nearby Los Angeles locales and using their Dodge Caravan as a

makeshift dressing room. "We tried to find places where we could film for free, but there were times when we liked a spot and would sneak a few shots," says Steven. "It wasn't always easy, because we were also trying to perform." He recalls one incident when a park ranger asked what they were doing, to which they responded, "taking some vacation pictures." They left, but only after getting the desired shots.

Obtaining the footage of the sunset scene was especially challenging because of the short time frame between the so-called "magic hour," when the shadows are deep and everything is awash in a red glow, and sundown, when the gray of evening settles in. "We wanted a shot of all 'four' band members—which is me at vocals and playing the drums, and Steven playing the guitar and keyboard," says BenniQue. "It had to look like four different people, so we had to change for each take, but we had to act fast, before we got caught and before the shadow movement became too obvious in the shots."

These shots turned out to be so striking that many people who see the video ask about the effects in them, but there are none in that segment. "About 10 percent of the project is pure videography, and that's some of it," says Steven, who, along with BenniQue, co-directed the project.

Jack and Jill of All Trades

In fact, directing was just one of several roles each assumed. BenniQue found herself on familiar ground as the video's art designer. She also proved to be a quick study as makeup artist and costume designer, selecting uncommon garments from local thrift stores. However, her stint as a musician required more than a little practice—despite the fact that the drums she plays in the video are CG. "I had to play 'air' drums, which was far more difficult than it sounds. I have good rhythm, and I thought, how hard can it be to keep a beat?" she recalls. "I'll never say that again; drummers don't get enough credit."

Steven similarly had to learn to play "air" keyboard, as the only real instrument in the video was the guitar that he plays. "I imagined where the notes were on an actual keyboard, and later a musician friend verified that I was doing it accurately," he says. A cost-saver, the virtual keyboard also gave Steven the ability to create a "key" effect midway through the video whereby the ivories begin popping off and floating into space.

Created by Steven and BenniQue Blasini, *I Tiki U* features the couple in a number of roles, including an Egyptian queen and slave (right), as well as an animated segment with themselves as digital characters (far right).



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•••• Music Videos

Nearly half the video contains digital imagery, a large portion of it requiring frame-by-frame rotoscoping, accomplished in Adobe's After Effects. At one point, Steven devised a method of using NewTek's LightWave as a compositing tool, in a way that he would have normally used After Effects, so he could obtain full camera motion for a sweeping crane move without having to track the images while mixing the media. In short, he used After Effects to cut the mattes, from which he generated alpha channel images. Next, he used the alpha channel images to apply a black-and-white clip map image to represent a portion of the 3D model to be clipped. This essentially generated a cardboard-like cutout of the images, but in actual 3D space. For generating the shadows, he used the 2D version of the cutout, made it invisible to the camera, and turned it

180 degrees so it would cast a shadow just as a 3D element would.

"I thought I'd be limited in my options because the cutouts would look like cutouts," Steven notes. "But I was able to get dramatic sweeping shots that didn't make the images look flat at all."

After completing all the filming and CG work, Steven edited the video using Adobe's Premiere Pro, and then output it to DVD format using Adobe's Encore DVD. In addition to submitting *I Tiki U* to film festivals, the couple is using the music video to showcase their work on multiple levels: collectively as a song/video package and individually with the song and video as separate pieces.

So what will the Blasinis do next? "We have at least five more songs that we wrote and are hoping to make videos for," notes Steven, "so stay tuned."

● Art

● Laurence Gartel's *Trance / Dance and Other Living Things*

A music video is the fusion of two artistic elements: music and visuals. While most use film, video, and animation to accomplish the visual portion, there is one art form that's often overlooked—digital fine art. And as CG art pioneer Laurence Gartel illustrates in a recent music video collection called *Trance/Dance and Other Living Things*, it's one that can raise the music video bar.

Gartel recently tapped the modern art segment of this seldom-used music video resource to create what he calls "digital music movies," which establish a visual melody to 28 songs by a range of "offbeat" techno-music recording artists featured on a compi-

lation CD/DVD from Raggaforce Entertainment. Just as each song on the disc is unique in style and rhythm, so are the accompanying images—thousands for each single on the release.

"The multimedia disc contains a kaleidoscope of visuals, moving and working in a unique way to look more like evolving art than anything else," describes Gartel.

To create all these visual elements, Gartel dug into his personal image reserve, a 30-year collection spanning the early days of computer graphics to the present. In addition to altering some previous works, he also generated new content using 2D and 3D software, video, traditional painting, and graffiti art. "My bailiwick is to do it all, and that is why the images look uncommon," says Gartel.

Like the graphics themselves, the tools Gartel used to make them could be from the annals of computer graphics. Some of the earliest pieces were crafted on a Commodore Amiga computer and the first Apple Macintosh. More current works were created on an iMac running a range of software, including Adobe's Photoshop, Corel's Bryce, Curious Labs' Poser, and Electric Image's Amorphium, as well as a proprietary fractal-based program the artist had written himself.

During the past year, Gartel began making collages by integrating the imagery—traditional and digital, past and present—in perfect time with each song. Having never synchronized imagery to music in this manner, Gartel soon realized how laborious a process it was. "You can't just throw a bunch of images together and hope they coincide with the music," he says. "The music is precise." So Gartel listened to each song repeatedly, interpreting the tone and style of each one. Then he listened some more, familiarizing himself with every note.

Only then was it time to compile the accompanying visuals and "evolve" them to the beat of the music, which Gartel did inside Apple's iMovie video editing software with assistance from his friend Steve Danzig. Each four-minute song track contains approx-



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Gartel's unique artistic style is autobiographical, representative of his cumulative experiences, both professional and personal.

● Computer Games

● COLD's

With My Mind

It's not uncommon for a music video to contain clips from a film, especially if the song is on the movie's soundtrack. Rarely, though, does a music video incorporate images from a computer game. But a recent collaboration between the band Cold and Midway Games proves that music videos can be fun, and games.

In what may be the first project to unite the two popular entertainment forms, Cold and Midway created both the song and the video to *With My Mind* based on Midway's *Psi-Ops* action/adventure game. Directed by Marc Webb, the creative mind behind several other Cold music videos, this project features a live performance by the band integrated with CG animation from the game.

Both Midway and Cold agreed on the content and the style of the video, which takes viewers into the world, and mind, of the game characters in *Psi-Ops*. This unique title from Midway breaks the usual shoot-'em-up game mold by combining traditional weapons with "psionic" (mental) powers, including telekinesis, remote viewing, mind control, mind drain, and aura viewing.

Because Cold wrote *With My Mind* specifically with *Psi-Ops* in mind, the song lyrics closely follow the game's story line, as does the imagery. In fact, some 40 percent of the visuals in the video are from key CG scenes within the game. Crafted mainly in Alias's Maya, the character models and animations are somewhat lifelike, though their features and expressions



The band Cold and Midway Games joined forces to create a song and music video for the game developer's *Psi-Ops* title. Aside from footage of the band, the music video also contains CG imagery from the game.

were slightly exaggerated for dramatic effect.

The other 60 percent is footage of the band's performance. For these sequences, the band's stage set was designed to resemble the *Psi-Ops* environment—harsh and foreboding. "The lighting matches the feel of the game and worked well without any post manipulation," notes Bill O'Neil, project editor.

To match the moody feel of these video seg-

ments, the artists stripped most of the color from the CG footage during the film-transfer process, increasing the black levels so very little color showed through. To augment this dark style, O'Neil and producer Jim Tianis chose to use fast, choppy cuts that gave the video the same sense of frenetic energy, urgency, and tension present in the game.

As for Midway's decision to use the music video to promote a computer game, senior product manager Randy Severin explains, "Cold's fans are video game players, too. It's a great way to reach basically the same audience." ■

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

imately 10,000 interrelated stills and video and animation segments, all of which were created or manipulated on the computer. Yet, as Gartel explains, the "still" images are not static photos, but actual artwork that has been processed for the video medium. They evolve, or animate, as they are played in succession, he says, so in the end they tell a story.

Gartel's hybrid music collection is, indeed, a true multimedia project. Not only does it embrace a range of visual media, but it can be played on a stereo, computer, or television, depending on whether the audience wants an auditory or visual experience, or both,

"We are living in computer times, when anyone can use a swirl filter, for example, but it's how you massage the pieces and make the great leap from static art to multimedia storytelling that make a project like this so different," explains Gartel. "People have a difficult time labeling this type of work, and I like that. I see it as a new genre of performance art and entertainment merged into one, new cutting-edge art form."

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..... Gaming

MOVIES

LIKE IN THE

Visual effects wizards apply filmmaking techniques to enhance gameplay while creating a more cinematic look

By Barbara Robertson

With the increasingly powerful real-time graphics capability of game consoles and PCs giving game developers the tantalizing possibility of creating ever more sophisticated graphics, the word “cinematic” is frequently used to describe the result. Often, though, “cinematic” is used as a synonym for “photorealistic,” which itself is a synonym for “realistic.”

Still, a few game developers have begun applying the game engine’s power beyond making only realistic-looking characters and beautifully textured backgrounds. These developers are learning how to use techniques from the film world to enhance gameplay and create a more interesting experience. Thus, given the intense competition in game development, it’s no wonder companies such as

Electronic Arts have been actively recruiting art directors from film effects studios.

Two such senior art directors at EA, Henry LaBounta and Habib Zargarpour, have reinforced that trend by creating stunning game visuals for what have become two of EA’s most successful games: the snowboarding classic *SSX3* and the *Need for Speed Underground* racing game. The racing game alone has reportedly sold more than seven million copies.

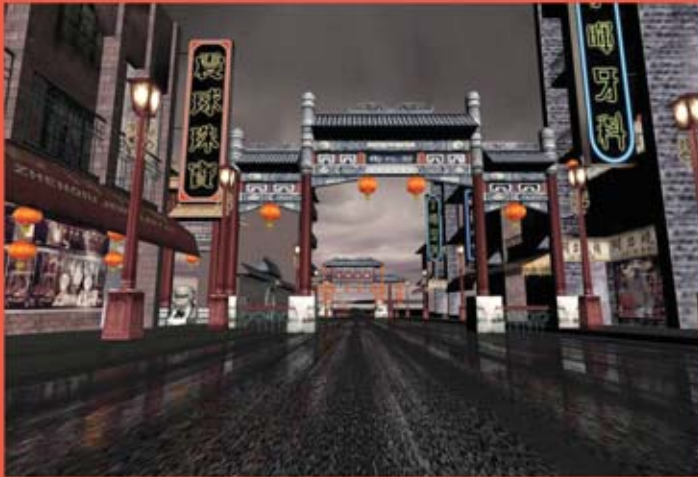
LaBounta joined EA in Vancouver, British Columbia, two and a half years ago from PDI/DreamWorks, where he was PDI’s visual effects supervisor for *Minority Report*. Before that, he parted the Red Sea in *The Prince of Egypt* for DreamWorks. And prior to that, he was at Industrial Light & Magic, where he received an Oscar nomination for the visual effects in *Twister* along with Zargarpour, who received a second Oscar nomination for his work at ILM on *The Perfect Storm*. Zargarpour is equally well-known for leading the team that developed the pod race in *Star Wars*

Episode I: The Phantom Menace under the supervision of John Knoll.

While many of the tricks and techniques that LaBounta and Zargarpour have brought to EA are visible on screen, others go beyond the inner workings of a game. “I was surprised by how easily and readily I could apply tricks and techniques from films to games,” says LaBounta. “I thought there would be more technical limitations than there are.”

Pre-Production

One of the big differences LaBounta and Zargarpour noticed was that game developers paid less attention to developing a style for a game during pre-production than they had experienced in the filmmaking world. “Directors of photography and cinematographers in film



For the game *Need for Speed Underground*, Habib Zargarpour, senior art director at Electronic Arts, applied such visual effects techniques as actual velocity motion blur, honed while working at Industrial Light & Magic on sequences including the pod race in *Star Wars Episode I: The Phantom Menace*.

spend a lot of time developing a visual language,” says LaBounta. “But in games, I think people were comparing what they were doing to the competition or to what was done last year when they looked for ways to make it look better.”

Thus, LaBounta and Zargarpour expanded the visual development pre-production phase to further refine the concept art. “It’s hard to set a high initial visual target without going through reference gathering, editing, and concept art stages,” says LaBounta. “Even if you know a game or a sport in your head, it’s hard to make up a beautiful image from scratch unless you’re a master painter.” Moreover, it costs less to create concept art than full 3D scenes. “If a concept sketch is not working, we can throw it away and do another,” he says. “It’s a creative process.”

When Zargarpour began work on *Need for Speed Underground*, he started developing the look of the game well before putting the ideas into production. “In film, I would have to prove the look before we created it, but this was not the norm in the game industry,” he says. “People tried using videos here and there, but we honed in on what the game could look like just

as we would in a visual effects process.” To accomplish this, Zargarpour’s team used assets and geometry from the game to create a video that represented the visual style they were trying to achieve and showed how the effects would enhance the sense of speed.

“There are some games that have strong art direction, where visual goals have been applied through the game, but in a lot of cases, I think the games look the way they do by accident,” Zargarpour says. “You could argue that it’s better to stay free and loose to the end of development, but I think that if people plan what they want to achieve early on, everyone can work toward that goal and know what they need to develop for it in terms of programming and rendering.”

Another surprise for LaBounta when he moved into games was the lack of color control during production. “When I started at EA, and I’ve since found this to be true at other game companies, there was no calibration for the TVs or monitors; no one was looking at the video signals on a scope. As I walked around the

floor, the colors of a game would change,” he explains. He hired a contractor to calibrate the monitors, and he implemented a controlled lighting environment for consistency throughout the day. “We had artists with rays of sunlight hitting their screens while they tried to do the lighting,” he says. “We’re not working out of a garage anymore. This is a professional environment; we need professional standards.”

Lights

For *Need for Speed Underground*, Zargarpour was given two requirements from executive producer Chuck Osieja for creating the look of a street racing game that would take place entirely at night. “There were a lot of concerns about visibility,” he says, “about not getting claustrophobic

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and helping players see where they were going. Second was adding to the sense of speed.”

Games are often brightly lit to make it easier for players to navigate, but Zargarpour had other ideas. “The constraint of night racing spurred us to find out how we could use visual effects to guide the eye.”

Drawing on his film experiences, Zargarpour brought motion blur into play. “I think this was the first use of actual velocity motion blur on a console game,” he says. “It helps give a sense of speed because your eye can follow an object off screen, rather than having a random set of flickering textures.”

In addition, the team used streaking lights to give a sense of speed and to help with navigation. For reference, they used a music video by singer Terri Clark in which time-lapse footage and streaking lights created an illusion of speed. “It’s part of motion blur,” Zargarpour says, “but it’s a High Dynamic Range effect, so we made our version appear like a light trail, and it became a unique look for *Underground*.”

The team also selectively lit areas of the environment to help with navigation, using pools of light and colors to lead the driver. “All these effects were in the video we created in pre-production after making sure our rendering programmers thought each effect was feasible,” Zargarpour says. “Arn Arndt, our chief rendering programmer, led a team that identified each effect, split them out, and implemented them.”

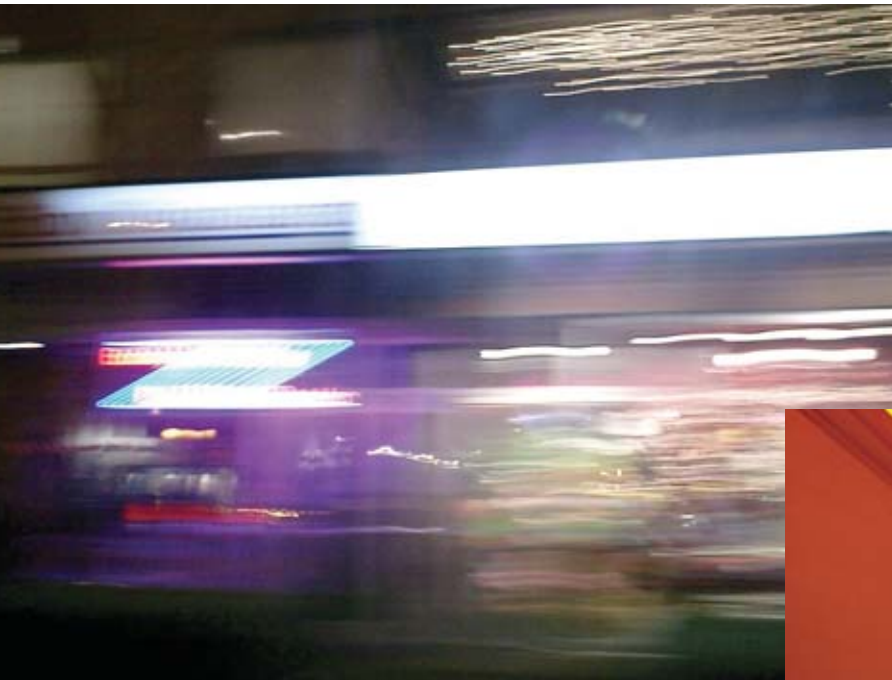
“People have said that *Underground* isn’t photoreal,” adds

Zargarpour, “that it’s its own thing. That was the idea. It was designed for night racing, to make you feel a certain way. The wet street makes you feel like you’re driving on glass, like you’re flying, and it gives you a little bit of a fear of heights; the motion blur brings back the sense of speed.”

Although *SSX3* takes place in daylight, LaBounta, too, used lighting and rendering techniques from the world of visual effects for film to enhance gameplay. “The executive producer wanted the game to be bright, shiny, and new,” says LaBounta. “In the previous games, the programmers did a great job of putting in basic capability. As I started on *SSX3*, I came up with a list of 30 things I wanted to be able to do. They rolled their eyes at what I was asking for, but we implemented a new approach.”

Rather than trying to do all the lighting with the real-time engine, LaBounta split the effects into pre-baked and real-time. “In *SSX3*, we have snow, trees, rocks, cliffs, and shadows cast from trees that don’t change, so they could all be done off-line,” he says. “I told the programmers, ‘Rendering software programs like RenderMan and Mental Ray do a good job of calculating lighting, so why not spend your time on effects that are dynamic and pre-calculate all the lighting that can be done offline?’ By implementing Mental Ray for our lighting calculations, we were able to go from a sticks-and-stones lighting method to sophisticated lighting that rivals what’s being done in film.”

That approach even extended to using High Dynamic Range radiance techniques to light the real-time snowboarding characters and integrate them into the environment. The real-time rendering engine probed “radiant spheres,” that is, spheres into which images of the environment were mapped, to calculate lights and colors that were applied to characters as they moved down the mountain. “It didn’t affect performance,” La Bounta says. “We bake the lighting



Lighting effects such as these in *Need for Speed Underground* were previsualized in videos using game elements before being implemented in the game. The streaking lights helped players navigate, created an illusion of speed, and gave the nighttime racing game a look that is unique compared to most games, which are typically brightly lit.



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down to an array of vectors that can be applied as efficiently as the real-time lights, such as street lamps or lights from windows, that are typically used in games.”

The artists working with LaBounta warned him that to make it easier for game players, the producers would want the characters super bright, to stand out from the background rather than integrating them into the background. “That went against everything I know,” says LaBounta. “I want characters to be nicely integrated, to be believable. What we did instead was use a common film trick, rim lighting, to achieve the objective of gameplay, so that even in a dark environment we could see the edges of the player.”

Similarly, Zargarpour applied standard lighting tricks from film to *Need for Speed Underground*. “In visual effects, one of the basic CG tricks is that to make a CG car look like a real car, all the reflections are bright, overexposed. We also put reflections into the wet streets. And, across the frame, we made the black levels black. We know that if black levels are gray, the environment looks fake. But with the exception of a few games, black typically isn’t used because the players need to see everything in the scene. We weren’t afraid to hit those blacks.”

Camera

One important part of the visual language Zargarpour and LaBounta developed for the games they art direct is the camera—the “photo” half of “photorealism.” “If you go back a few years in games,” says LaBounta, “the player’s character would always be dead center on the screen all the time, even if it was jumping, falling, or turning, and the camera was always locked onto that character. But with that you lose the impact of the experience, and it’s not interesting visually.”

Thus, for the gameplay camera in *SSX3*, LaBounta took advantage of the fact that the camera can anticipate some things about the player’s movement in advance. “If the player was likely to have the character snowboard to the right, we’d swing the camera left to get a better view of where he is going and help the gameplay in that way,” he says. “When the

character jumps, we let it go up to the top of the frame; when he’s falling, we let him get closer to the bottom. In film, you never have a camera lead the character; it’s always lagging behind, having to keep up with the action, and we tried to apply that in the game.”



By implementing such color-quality controls as monitor calibration and consistent lighting conditions, Henry LaBounta could be sure everyone working on *SSX3* was using the same color palette.

For non-interactive sequences—those scripted sequences in which a character might tell the player something about the game or congratulate the player—the trick was to give the camera a little brainpower. “We didn’t know which characters would be used or where the sequences would take place, so we gave the camera rules to use to create interesting camera angles,” LaBounta says. “It used to be that as long as the characters were in the screen and we could see them, that was good enough. But that’s like movies in the 1920s. Today, cinematographers spend a lot of time setting up the right camera angles, and we wanted to have that quality in the game visuals as well.”

Camera effects in *Need for Speed Underground* were also designed to enhance gameplay. “We learned on the pod race that when you have a camera locked to a car, it doesn’t feel as fast,” Zargarpour says. “We struggled to apply that to the game. We knew that it couldn’t hinder the game experience by not allowing you to see what you were doing. So instead of locking the camera to a car, we simulated a cameraman hanging out of another car trying to film the player’s car.”

To help design camera moves, the *Underground* team created a tool that’s now called ICE, for in-game camera editing, that gave them real-time camera editing. “We could do cuts and pre-



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The foreground blends seamlessly with the background sky box, or matte painting, because the artists paid attention to perspective lines and matched the color temperature of the shadows for *SSX3*.



The Dream Team

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view what was going on by scrubbing through time using the PlayStation 2 controller,” says Zargarpour.

Zargarpour also helped develop cinematic camera techniques for the game *James Bond 007: Everything or Nothing*. A camera-man follows Bond when he’s racing his bike into the sun, camera shake was built in to simulate a hand-held camera, and the non-interactive sequences in the game used an aspect ratio closer to letterbox than typical game screens.

Textures, Simulations, Compositing

For *Bond*, Zargarpour’s lead rendering engineer Peter Doidge-Harrison used a trick from visual effects called multi-texturing. “You don’t want to see repeatability in textures, so in large areas, we use different textures at different scales,” he says. “Using streaming technology, we could load different parts of the world as we needed them.”

Zargarpour also applied his knowledge of rigid-body simulations to oversee the creation of complex explosions for *Bond*. “There was no such thing as too much over the top, so it was a lot of fun,” he says. “We’d used the game physics when we could; otherwise we’d do rigid-body simulations in (Alias) Maya or (Discreet) 3ds max, bake those, and play them back.”

Explosions weren’t important in *SSX3*, but large vistas were, so LaBounta applied techniques learned in creating matte paintings for film. “We had a great concept artist, Tom Johnson, who had worked on *Final Fantasy*, create the sky box, which in film terms is a matte painting,” he says. “I wanted it to look like part of same world as the path the snowboarder is on. As people in the film world know, you can get 80 to 90 percent of the way there quickly, but that last 10 percent takes a lot of tweaking. It was a shock for the people here, how much noodling I wanted to do to nail it. But now the color temperature of the shadows matches the foreground, and the perspective lines make it look like it was all shot through the same lens.”

Although, for the most part, everything in a game is rendered at the same time in one pass, LaBounta experimented with a form of real-time compositing. “The light bloom that we used in the caves and color-timing effects were filters that could be considered compositing operations,” he says. “We’ve just scratched the tip of that iceberg. I hope that with the next generation of hardware we can use more advanced techniques such as rendering multiple passes and applying separate mattes for image processing operations. These techniques will soften that artificial hard edge of video games.”

LaBounta believes that in the future, people will see scenes



Artistic effects such as the light bloom in the cave (top) and the expressive trees (above) were first created as concept art to develop a consistent visual language for the game *SSX3*.

from video games and not be able to immediately identify them as video game images. But while recognizing that cool visuals can affect sales and reviews, the goal is always to enhance gameplay. “We have a lot of areas to explore in invoking an emotional response,” he says. “In movie theaters, you get scared, you cry, you’re happy because you believe the images are real. But millions of polygons and beautiful texture maps alone won’t make an experience more believable. You also need to pay attention to physics in the properties of light and know how cameras work. Games aren’t limited to photorealism, but we haven’t achieved photorealism yet. It’s a good goal to have.” ■

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

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child's play

By Jenny Donelan

The painterly and realistic backdrop of wartime Korea is an ominous world of wonders for Birthday Boy's stylized main character



Images courtesy Sejong Park.

The expressive face of the lead character in "Birthday Boy" was widened by animator Sejong Park to help achieve a stylized look.

"**Birthday Boy**" is a timeless story set in a specific place and time—Korea in 1951. As the young protagonist of this nine-minute CG movie meanders home through a nearly empty town, we observe the bombed-out buildings and the ravaged landscape of a country at war. But we also see the delight on little Manuk's face as he finds a screw in the empty fuselage of a plane, or watches a stream of tanks roll by on the back of a

transport train. The camera spends a lot of time on that face, which is at one moment keenly concentrating, at another seemingly devoid of thought. It's the face of any child at play. But Manuk's simple diversions take place against the backdrop of a war that will soon affect him much more than it already has.

"Birthday Boy," which was named Best Animated Short in the Computer Animation Festival at SIGGRAPH 2004, is the first 3D CG film from animator Sejong Park, a recent graduate of the Australian Film Television and Radio School, where he completed the project. (The film, incidentally, is also the first from the school to have earned the prestigious award at SIGGRAPH.)

The inspiration behind the movie, Park explains, was the desire to compare the innocence of childhood with the realities of wartime. “I wanted to tell the story of human life using animation,” he says. “Life is not always fun; it includes both happy and sad times.”

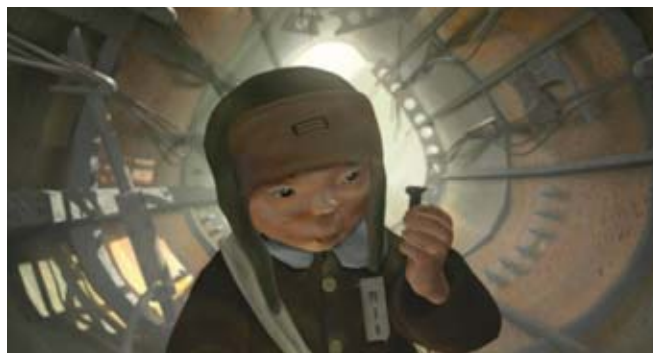
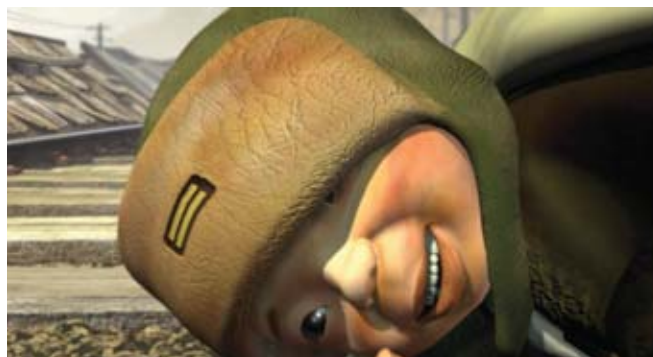
Park says that “Birthday Boy” is also a reflection of his childhood in Korea, where he was born and where he lived until he was 31. Though his relatives weren’t involved in the war, “it is still recent history and very much alive in the Korean consciousness,” he says.

Park also relates to Manuk’s creativity and resourcefulness. In the film, the child crafts soldiers and other toys out of bits of metal that he finds on his rambles through the half-destroyed town. “I was never given any toys as a child and enjoyed making my own,” he recalls. On moving to Australia, he was struck by how many presents children received for their birthdays. “This was a vast contrast to my own childhood experience. It was very different in Korea.” Even so, “Birthday Boy” doesn’t preach or deliver a heavy-handed message. The story proceeds at a deliberate and gentle pace, as we observe Manuk’s interactions with his surreally disrupted world.

It’s a story for which CG animation would seem to be the medium of choice rather than the medium of necessity. “Birthday Boy” doesn’t have any chatty aliens or inanimate objects that spring to life. There are no otherworldly textures or blue fur. In fact, the film could theoretically have been shot with live actors, or made in 2D. But Park says that 3D software tools he learned to use at school made it possible for him to control the look and vision of the animation in a way he couldn’t have otherwise.

To begin with, although Park was already a 2D animator and illustrator before he began work on “Birthday Boy,” using 2D animation would have required more involvement from more people, and would have taken longer. “In 2D animation, you need to do cleanup, in-betweening [creating the drawings between key frames], ink and paint, layout, layout cleanup, and background painting,” he explains. “With 3D animation, although the modeling and character setup take a lot of time, once it’s done, there’s no in-betweening or cleanup time needed.” And, he adds, once a 3D character has been textured, it doesn’t need to be textured again, as it would in traditional 2D animation.

Park began “Birthday Boy” by drawing the storyboard by hand. He then scanned in the storyboard, and used Adobe’s After Effects to create a 2D animatic. To make Manuk, he first sketched him by hand, then modeled him in Alias’s Maya. All the textures used for



Hand-painted mattes provided the backdrop for Manuk’s bombed-out town (top) and hand-painted textures gave a realistic look to his coat and cap (center images), as well as to the various metal objects that become his toys (bottom).

●●●● Animation

Manuk's skin and clothes were hand-painted. His clothing was scanned from an original concept painting, and his face was hand-painted in Adobe's Photoshop. Park created the airplanes, tanks, and trains in Maya, relying, he says, on a combination of period photos for reference and his imagination. "The models are not highly realistic," he notes, "but I tried to make them conceptually realistic for the story."

To achieve a consistent look for the project, Park had one associate create all the matte paintings for the backgrounds (in Photoshop and Corel's Painter) and another do all the lighting (in Maya). He also sought a "stylized, realistic" look that was different from that of most other 3D animations. To do so, he chose to work with people on the basis of their artistic abilities rather than their technical skills. Rendering was done in Maya, and all the elements were composited in Discreet's Flame.

Manuk, as the central and almost sole character in the film, represented one of the biggest challenges for the director. Park wanted him to look realistic enough to match the setting of the story, but stylistic enough to look like animation. "It was very difficult to create both a stylistic and realistic character," he said. He ended up widening the face and body of the child to achieve that stylized effect. But he sought



The look of concentration on Manuk's face is designed to mirror that of a real six-year-old boy who was observed by the animator.

to create textures and facial expressions that were as realistic as possible.

To make Manuk look and act like a believable character, Park studied the facial



CG animation provided a cost-effective way to create scenes of 1950s Korea, such as an old crash site in which a rusting airplane lies embedded in a building.

features, expressions, and movements of a real six-year-old boy—his wife's nephew. He videotaped the boy, then viewed the tapes as a basis for the boy's movement. "This was more of a study—I did not rotoscope any of the material," he says, "but used it for ideas." Manuk is completely keyframe-animated, notes Park. When Manuk marches at the end of the movie, his arms and legs are out of synch because the real-life boy moved that way in the video, and Park decided to copy that motion. And when the character sniffs, then wipes his nose with his hand, he's mirroring the movements of an actual child as interpreted by Park.

His live model's facial expressions also served as inspiration. One of Park's achievements in this film is allowing us to see Manuk's world not exactly through his eyes, but as reflected in them. For much of "Birthday Boy," we are at eye level with Manuk. His face often fills the screen. We watch him register determination, surprise, satisfaction, and wonder—emotions that seem genuinely childlike. Whether he is scurrying between bombed-out houses or scavenging in airplane wreckage, he is happy and content in a world that would seem bleak and frightening to us.

Of course, it is his birthday, though to Westerners, there is little beyond the title of the movie that would indicate this,

except for a few subtle cues. Park explains that the badge Manuk wears says, "Happy Birthday" in Chinese characters, and that the dinner table that appears in the final scene of the film is set for a special birthday meal and is clearly recognizable as such to Korean viewers.

Park's engaging protagonist, muted style, and affecting story have appealed to juries since the film was completed this year. Besides the SIGGRAPH award, "Birthday Boy" has won more than 10 prizes in Australia, and recently earned an Award of Distinction at Prix Ars Electronica in Linz, Austria, as well as the Jean-Luc Xiberas award for a first short film at Annecy.

Park, who has now graduated with a master's degree in digital media from the Australian Film Television and Radio School, is continuing a career as an animator and illustrator. Of the poignant message at the heart of "Birthday Boy," he says, "I wanted to make a film that was different from the usual ones with a lot of comedy and happy endings. It's been really encouraging to me to find that 'Birthday Boy' has been self-explanatory to those who have seen it. People obviously understand what I'm trying to convey." ■■

Jenny Donelan is a contributing editor for Computer Graphics World. She can be reached at jdonelan@adelphia.net.

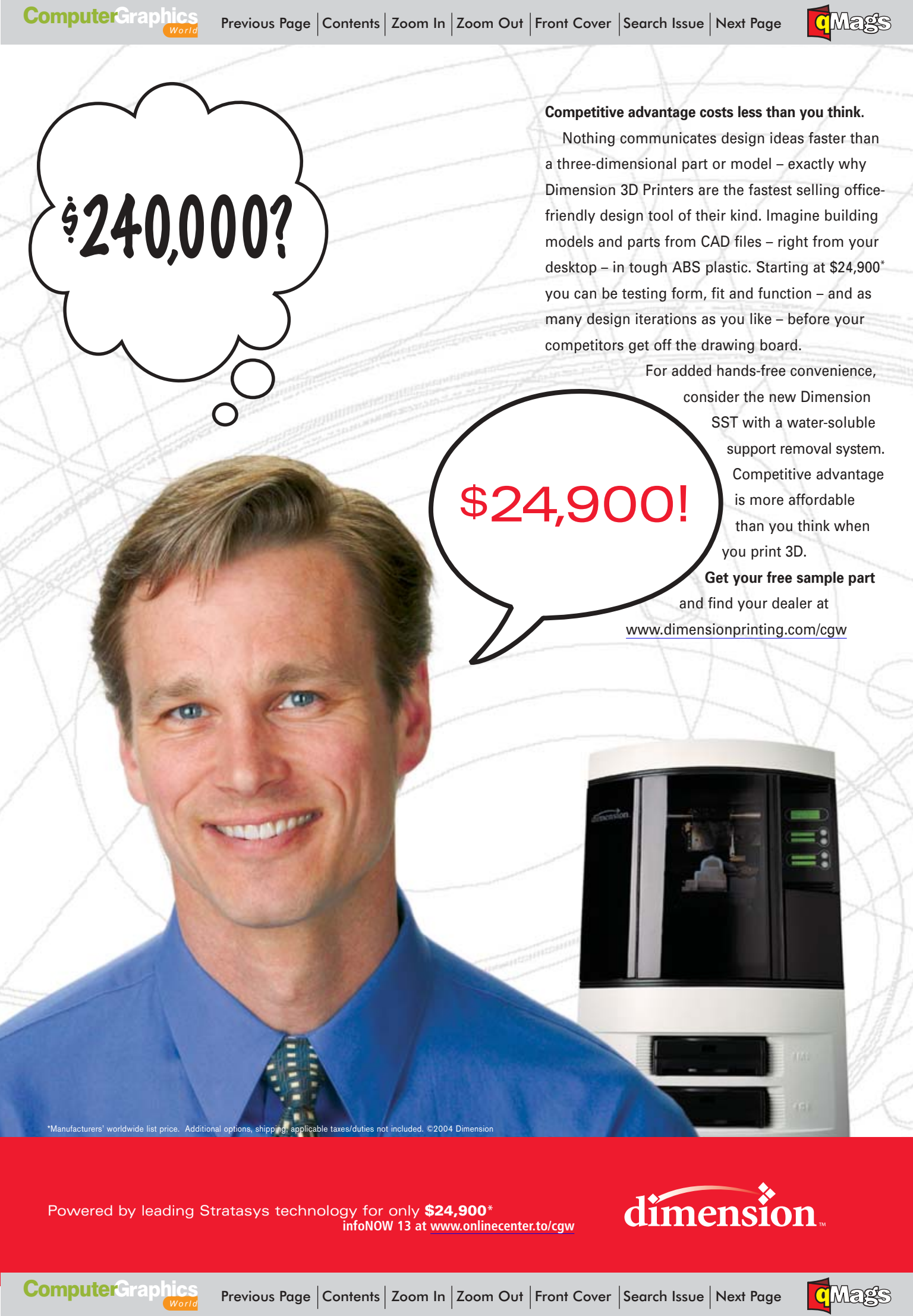
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Portfolio

SIGGRAPH 2004 Animation Theater

**Clockwise from top left:**

Microcosm, directed by Joe Takayama of the Kyushu University in Japan, uses original software to generate a micro world of organisms whose simplistic cell structures form artistic shapes.

Oddworld Stranger CG Intro, directed by Lorne Lanning, provides a glimpse into the game world, created in Maya, that's inhabited by a bounty hunter called Stranger.

Pffirate, directed by Xavier Andre and Guillaume Herent of Supinfocom/One Plus One, is a 3ds max production featuring an inflatable pirate who defends his boat against a determined bird.

eu esperu, directed by Damien Stumpf and Mickael Lorenzi of Supinfocom/One Plus One, uses Maya models to tell the story of an old man waiting for the rain to fall so he can save his garden.

The 2004 SIGGRAPH Animation Theater featured a selection of projects illustrating revolutionary ways of implementing the still-young medium of computer graphics within the diverse fields of visual arts, entertainment, and science. Some of the pieces were selected for their artistic level, others for their compelling storytelling. And, there are those that represent technical achievement in the advancement of computer graphics, animation, or visual effects.

According to chair Chris Bregler, this year's Computer Animation Festival, which includes the Animation Theater and the prestigious Electronic Theater, contained an unprecedented breadth of animations. "We had variety—submissions from the major film schools, the major studios from New York City to London to Brazil, and individuals,



all of which tell engaging stories or focus on edgy topics, or are just plain funny," he says. "In particular, we had a lot of strong short stories, so the jury had to be especially selective. As a result, a lot of big studio pieces and short-story projects—which would have been selected a few years ago—didn't make this year's cut."

To accommodate the 53 works that were selected for the Animation Theater, the jury assigned them to one of four shows, titled Paraphernalia, Magic, Commercials/VFX, and Twisted, which played at different times during the conference and exhibition.

"There is a definite edge to the show, some of it expected and some of it a surprise," says Bregler. "There are even selections that reflect the current times in which we live."

Several still images from the theater appear on these two pages. —Karen Moltenbrey

Clockwise from top left:

First Life, directed by John Bair of Edgeworx, uses 3ds max and photographic effects to simulate the cosmic events that formed Earth.

1 May, directed by Daniel Zdunczyk of Virtual Magic, is a 3ds max-created hyper-realistic rendering with simulated motion dynamics.

The God, directed by Konstantin Bronzit, uses Softimage|XSI and Mental Ray to illustrate a god's quest to eliminate a pesky fly.

Tetra Pak: Forests, directed by Frederic Planchon of the Moving Picture Company, shows greenery, created with BioNatics' tree simulation software, sprouting in unsuspecting spots along a London street.

The Pier, directed by Jason Bennett of Ringling School of Art and Design, tells an unusual fish tale that was generated in Maya.

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SPECIAL SECTION

storage in the studio

THE LATEST TRENDS

IN DATA STORAGE

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PROFESSIONALS

Breaking Barriers*EFilm teams storage area networks and low-cost disk storage***Scaling Up***The Orphanage adopts a shared file system to manage growth***Keeping It Simple***Stargate Digital relies on disk arrays for easy upgrades***Growing Pains***Cry Havoc spells relief with direct-attached storage*

Breaking Barriers

EFilm enlists storage area networks and low-cost disk storage in its quest to redefine the state of the art of digital mastering

In Hollywood, pushing the envelope beyond what's been done before can bring high praise from critics and industry peers. According to EFilm, a leading digital intermediate film company and subsidiary owned by Panavision and Deluxe Laboratories, it can also bring you almost more business than you can handle.

That's the double-edged sword of success EFilm has had to deal with since it created the first 100 percent digitally mastered feature-length film in 2001—Paramount Pictures' *When We Were Soldiers*, directed by Mel Gibson. The film, mastered in standard definition, or 2K-resolution format, soon brought other filmmakers to EFilm's door for the same digital intermediate treatment. According to Bob Eicholz, vice president of corporate development, EFilm now routinely handles between 10 and 20 film projects at any given time.

In large part because of the reduced cost of disk storage, EFilm was also able to achieve another digital mastering breakthrough with its recent work on *Spider-Man 2*, for which it produced the world's first 4K-format, high-definition, digitally mastered feature film. "What you see on the screen is much better than anything that you can get out of a normal film process," says Eicholz.

"It would have been cost prohibitive to do a 4K movie three years ago," Eicholz explains. "At that time, a single terabyte of storage cost about \$20,000. If you needed 4 terabytes for a 4K movie,

the cost was astronomical. That cost is now in the \$2000 to \$4000 per terabyte range."

The push into 4K digital mastering led EFilm to acquire an additional 120TB of storage earlier this year, in the form of several TP9500 disk arrays from SGI. The arrays are based on Serial ATA (SATA) disk drives, which are less expensive than Fibre Channel or high-end SCSI drives.

TO THE LIMIT

Eicholz and his 15-person team of "data traffic cops" meet at least once daily to determine how best to manage the flow of more than 200TB of data stored on the company's 19 storage area networks. The SANs include SGI's InfiniteStorage SAN servers, a CXFS clustered file system, and a mix of TP9400 and TP9500 disk arrays to manage and share data with users throughout the organization.

Eicholz estimates that when EFilm first begins work on a 2K film, the footage can take up about 3TB of disk space. After three weeks, however, this capacity can quickly expand to more than 10TB as the team adds multiple versions of scenes, lower (1K) resolution proxies used for color-correction work, and other video versions. By the time the project is finished, the film's storage requirements usually drop back down to around 5TB. The data is then archived to LTO2 tape via the use of Veritas's NetBackup software and a 200-cartridge tape library from Overland Storage. "The

only things we keep in our online storage are images that we're actively using," Eicholz explains. "Once we make a permanent tape archive for a film, we delete the files from the system."

Over the next two to three years, Eicholz expects 4K, high-definition, digital film to replace 2K as the industry standard used for feature-length films. To accommodate this, he expects EFilm's storage requirements to grow to as much as 800TB. He is looking forward to new generations of denser Serial ATA drives coming to market. While he admits that low-cost SATA drives are slower than other types of disk drives, his overall experience with them has been positive. "Although there was a

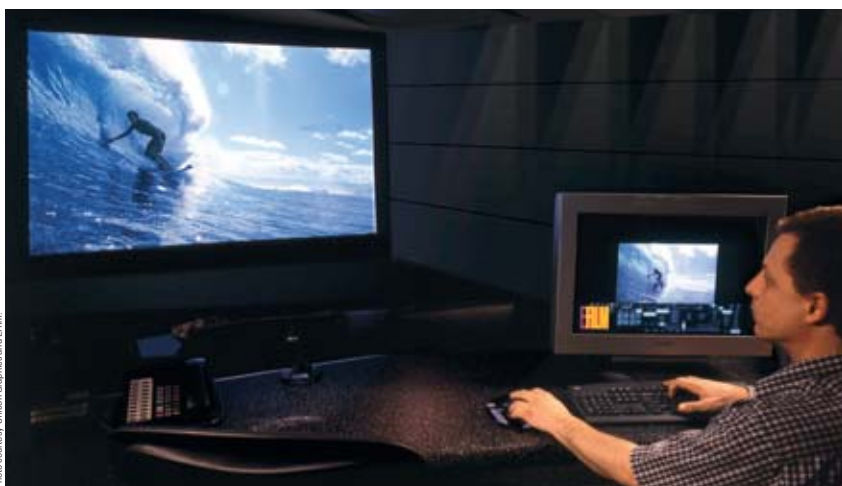


Photo courtesy: Silicon Graphics and EFilm

In addition to the 200TB of data stored on 19 storage area networks, EFilm also has more than 20TB of local storage for color-correction work, such as that being performed on the Hawaiian ocean waves and sky for the film *Blue Crush*.

batch of bad drives early on, for the most part they've been a god-send," he says. "They're fast enough for what we're doing. They're on the SAN, so we're not using them to play back in real time."

During its life cycle, data from a single movie can move through three or four of EFilm's SANs. In addition to content on the SANs, the company also has between 20TB and 30TB of local storage distributed across four color-timing rooms. These are the rooms where cinematographers view projected, digital 1K copies of their movie images and work with colorists to digitally correct each film sequence, using tools in a proprietary version of Discreet's ColorFront color-grading software. Work performed in these rooms might include tasks such as correcting the color of someone's eyes or—in the case of Universal Pictures' surfing film *Blue Crush*—changing the color of Hawaiian ocean waves and sky for film shot on overcast days.

EFilm has one SGI Onyx 3400 or 3800 system with 16 processors and 5TB of direct-attached storage in each color-coding bay. At about the same time the film is being scanned into EFilm's systems, Eicholz's team uses SGI's CXFS shared file system software to rapidly transfer 1K copies of each frame from the SAN to local storage in one of the color-timing rooms. He notes that in some cases the group is able to transmit the data from the SAN at a rate of more than 600MB/sec.

FILE SHARING

Eicholz realized early on that it would be necessary to limit the amount of large-scale data transfers between the color-coding bays and the SAN. Utilizing local storage in each room to implement color correction was key. "If we were all to try to play back 2K files off our SAN, each room would require a data transmission rate of 300MB/sec to 400MB/sec. No network could handle that bandwidth," he says. "Using low-resolution copies, we still need approximately 100MB/sec for transmission of 1K files from the local disk to the local computer. For 2K files, it requires a minimum of 200MB/sec to 250MB/sec. If you go below that, it gets choppy."

EFilm's storage-related choices have also been influenced by the need to make film data available to as many users as possible, when and where they need it.

Using SGI's CXFS shared file system to share files among multiple users is one way the company has reduced the need for large data copies and transfers. "CXFS allows a multi-operational system to access SAN files transparently, even though you're on Windows computers," says Eicholz. "Most of our users can access the entire 200TB without moving from one place to another."

Another way EFilm has engineered its systems to allow multiple users to access and manipulate the same film files at the same time is by designing software to effectively use metadata. For example, instead of altering the original film images, cinematogra-

Video Storage Fast Facts

The world of feature films and video consists of two basic formats: standard definition (SD) and high definition (HD). Standard-definition footage is played back at 2K resolution, which displays 2048x1556 pixels on the screen. In contrast, high-definition footage is played back at 4K resolution, or 4096x3112 pixels. Additionally, the amount of data generated per film can vary based on the number of extra effects incorporated into a movie.

Average storage size of a finished feature film:

At 2K resolution = 2TB

At 4K resolution = 8TB

Data generated as work product for feature film:

At 2K resolution = 10–100TB

At 4K resolution = 40–400TB

Average size of a single frame of film (one second of film consists of 24 frames):

At 2K resolution = 13MB

At 4K resolution = 50MB

Typical bandwidth required for real-time film playback:

At 2K resolution = 300MB/sec

At 4K resolution = 1.2GB/sec

Number of 2GB/sec Fibre Channel host bus adapters (HBAs) required for real-time film playback:

At 2K resolution = 2 HBAs

At 4K resolution = 6–8 HBAs

Number of 2GB/sec host bus adapters (HBAs) required for real-time video playback:

SD, 2K-resolution video = 1

HD, 4K-resolution video = 1–2

Average amount of active data managed by a large digital intermediate facility = 200TB

Storage required for one hour of uncompressed video:

SD, 2K-resolution video = 75–150GB

HD, 4K-resolution video = 360–900GB

Bandwidth for real-time playback of video:

SD, 2K resolution = 21–42MB/sec

HD, 4K resolution = 100–250MB/sec

phers or colorists performing color-correction work actually end up creating a “recipe” that describes any changes that should be performed on the image after EFilm finishes working on it. “While the cinematographer is changing original colors, he’s not actually changing the original scans,” Eicholz explains. When EFilm performs a final render or produces the final digital master of the film, all of the metadata changes made along the way then become incorporated into the original film images.

ETHERNET VS. SNEAKERNET

While EFilm has ironed out many of the work flow issues surrounding data access that tend to plague some production studios, Eicholz is the first to admit technology still falls short when it comes to getting the final digital masters from place to place at a reasonable cost: “The issue that’s not been resolved yet is how to effectively transmit that volume of data—in a full-length movie or even a scene—across a city or across the country.”

According to Eicholz, if EFilm had to send even a few minutes of film footage to, say, London, it would take all night to transmit

the footage electronically. While the technology exists to transfer such large-volume files at a faster rate, most studios—including EFilm—find the cost to do so prohibitive.

Instead, EFilm resorts to the old-fashioned data-transfer method commonly referred to as “sneakernet.” “We put the film on disks and put them on an airplane. It’s much faster and cheaper that way.” EFilm often uses standard RAID-protected SCSI or SATA disk arrays to ensure data integrity during transport. “If it’s really critical, we’ll send two copies on two different disk arrays,” says Eicholz.

Although the company’s film data resides on its primary Fibre Channel SAN, Eicholz knows it pays to have a backup plan for everything. In the odd chance that the SAN goes down, EFilm falls back to its Gigabit Ethernet network to access key data. “At the end of the filmmaking life cycle, we can’t have downtime or introduce delays at any time. So we try to have as much redundancy as we can.” Disk arrays in the SANs are all RAID-protected as well, a good practice because several of the hundreds of drives the company has in operation tend to fail daily, according to Eicholz. “We’re in a constant state of rebuilding somewhere.” •

Storage in the Studio

By Michele Hope

Scaling Up

The Orphanage adopts a shared file storage system to manage explosive growth

The Orphanage, a San Francisco-based special effects studio, is no stranger to explosions. In fact, the company’s nearly 200 artists—whose credits include the creation of 2D and 3D special effects for such feature films as *HellBoy*, *The Day After Tomorrow*, *Sky Captain*, *Spy Kids 3-D*, and *Charlie’s Angels: Full Throttle*—immerse themselves in the art of making explosions look more devastatingly real on screen.

The group’s impressive arsenal of credits has led to an explosion of sorts within the company as well, with staff growing from 20 employees approximately a year and a half ago to almost 200 today. And according to director of IT Nicholas McDowell, The Orphanage is just at the start of an exponential growth curve.

With ultimate plans for a staff of 500 to 600 employees, The Orphanage gives new meaning to the phrase “explosive growth.” It also highlights how important it’s been for McDowell and his four-person IT team to get the most use out of the company’s current IT systems and storage—all while developing an underlying architecture that is easy to scale at a moment’s notice.

EXPONENTIAL EXPANSION

The Orphanage’s storage needs have also expanded exponentially since McDowell joined the company a few years back. Take the

recent *HellBoy* special effects project that involved almost 10TB of storage capacity at its peak and more than 100 of The Orphanage’s artists. “At one point during *HellBoy*, we were generating 500GB of new data per day,” says McDowell.

When McDowell arrived, the studio had one Apple Xserve server and only 2TB of locally attached storage. Today, it has 18TB of storage in a core production system that consists of InfiniteStorage Shared Filesystem CXFS cluster software and a



In a few years, The Orphanage’s storage system has expanded from one server to nine, and from 2TB of disk storage to 18TB.



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storage area network (SAN) with nine SGI TP9100 disk arrays, each of which has a capacity of 2TB.

Presenting itself as a massive, scalable network-attached storage (NAS) device to clients on the network, the CXFS cluster has eight server nodes at the front of the SAN that act as NAS heads, with open-source Samba code to allow files from the SAN's shared file system to be saved or accessed elsewhere on the network via the CIFS or NFS protocols.

Three of the eight servers are SGI Origin systems (models 300 and 350) running the IRIX operating system. The other five are Linux servers from a variety of manufacturers (see "The Orphanage's SAN," this page).

The Orphanage's artists save and retrieve data from the shared file system via the three IRIX servers, while the company's renderfarm communicates with the file system via the Linux servers. Artists use Adobe After Effects software along with custom plug-ins to develop special effects sequences.

The artists then send their work to the renderfarm consisting of 200 Windows-based dual-processor Intel systems from Boxx Technologies. "To quickly and efficiently render a shot that requires up to 300 frames, you need a massive amount of rendering power," says McDowell. "Also, with the CXFS shared file system, an artist can be reading from the same file as the renderfarm works on it."

McDowell, who was already familiar with other clustering technologies prior to implementing CXFS, admits to a steep learning curve when it came to exploring the potential of the shared file system. "It's very powerful, but complex," he says.

Nevertheless, McDowell says the shared file system has played a pivotal role in The Orphanage's ability to scale its architecture, in terms of both server and storage capacity, without incurring downtime. Scaling up was difficult before because it involved shutting the system down to add another card in the server, attach more disks, and so forth, he explains.

McDowell is impressed by what he calls both vertical and horizontal scalability within the CXFS cluster. "Vertical scalability is adding more things: servers, disks, and so on," he says. "Horizontal

The Orphanage's SAN

Servers (NAS heads):

- 2 SGI Origin 350 (IRIX)
- 1 SGI Origin 300 (IRIX)
- 2 HP/Compaq ML350 (Linux)
- 1 Open Source Systems AMD 64 Quad (Linux)
- 1 SGI Altix 350 (Linux)
- 1 Boxx 3D workstation (Linux)

Disk storage:

- 9 SGI InfiniteStorage TP9100 disk arrays, each with 2TB

Storage software:

- CXFS shared file system

scalability is increasing the hardware within any of those devices. We have a four-processor Origin 350 that can scale to 65 processors. And we could multiply that by 32 nodes."

STORAGE CONSOLIDATION

How does McDowell see the system growing over the next year or two to handle the company's growth in staff, projects, and storage capacity? He already has plans in the works to increase the number of NAS heads from the current eight nodes to 15 nodes. On the storage side, he is looking at more TP9100 arrays, and also the possibility of a TP9300 or 9500 array to accommodate the addition of The Orphanage's editorial group (which uses Macintosh platforms) to the CXFS shared file system.

We still send gigs and gigs of data a day across the Gigabit Ethernet network. With storage now centralized, it helps to cut down on the amount of data transfers," McDowell explains. "There are still a lot of data transfers going on now because the editorial group is not tied into the CXFS file system." The editorial group is responsible for tasks such as processing all the tapes received in the studio, getting the plates in line, getting frame counts right, and

getting the dailies together so the work done that day is available the next morning for review. The team currently operates on its own separate network, which is not yet fully integrated into The Orphanage's production systems.

Once that happens, McDowell says he anticipates that the volume of file transfers will shrink considerably, which will translate into less storage capacity required. "SGI recently released a Mac OS X client for CXFS. Instead of the editorial group having its own storage, it can be [integrated into our central SAN storage]. That would save us a lot of money," says McDowell. •



For rendering high-resolution images like this scene from *The Day After Tomorrow*, artists at The Orphanage send their work to the studio's 200-workstation renderfarm. The shared file system allows them to read from a file as the renderfarm works on it.



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Storage in the Studio

By Michele Hope

Keeping It Simple

Although the trend is toward networked storage, Stargate Digital relies on direct-attached disk arrays

When it comes to managing the many terabytes of visual effects content produced by Stargate Digital for TV productions such as *Spartacus* and *ER*, the studio's director of IT Joseph Meier says that his staff's job is twofold: It must ensure efficient work flows with minimal interruptions and implement affordable systems that it can basically plug in and let run without intervention.

Given Stargate Digital's data explosion over the past few years—now at more than 22TB and growing—Meier's first step toward fulfilling his role was to simplify the company's IT infrastructure. "In the past, we had a lot of Macs and SGI systems as well as Windows-based platforms. Moving information across the platforms was more trouble than it was worth," says Meier. The team's solution was to reduce the number of operating systems in use to just one—Microsoft Windows. "Having a single platform makes information flow and work flow more efficient," he says.

Meier also decided to keep it simple with respect to storage. Although 22TB of storage may suggest the need for networked storage—such as a storage area network (SAN) or network-attached storage (NAS)—Meier opted instead to go with a few

discrete pools of disk storage directly attached to key servers on the network. "A SAN would not make financial sense for us. We figured out clever ways to keep the traffic down and give everybody access to the information on the drives, which has improved work flow as well as disaster recovery."

The company's storage consists of disk arrays directly attached to each of seven servers on the company's Gigabit Ethernet network. The storage resources currently include four Nexsan Technologies InfiniSAN ATABoy2 disk arrays and several Infortrend RAID arrays that Stargate purchased through Zzyzx Peripherals.

To keep track of all the shots moving through Stargate's system, Meier and his team implemented a custom SQL Server-based tracking system. "The shots themselves live in a traditional Windows-based file folder, since they need to be accessible by everybody so they all know where the base footage is," Meier explains. Contents of the folders might include such elements as ancillary digital stills or other files containing high-resolution, high-definition footage shot by Stargate's photographers or company founder Sam Nicholson.



To manage digital data for productions such as the TV miniseries *Spartacus* (above), Stargate Digital simplified its IT infrastructure to a single Windows-based platform and opted for discrete disk storage directly attached to its server network.

Some of the major challenges faced by the IT team involve keeping network traffic flowing at a reasonable pace. "Optimizing the network is a huge job that has required a lot of understanding of where the bottlenecks are," says Meier. "When you're moving as much data as we are, you need to keep the response times on the network to an absolute minimum so people don't have to wait for, say, 10 seconds when they click on the icon for the network drive."

RELIABLE STORAGE

Stargate's peak activity period tends to follow the television industry's intense production schedule. "From late March to early June, during the pilot season, it's horrendous around here. People are working around the clock. If we didn't have such an efficient pipeline to move the data, we could never do it," says Meier.

During this cycle, avoiding downtime is job one. "We need absolute reliability. Once we're in a production season here, I don't have time to rip something out and search for a replacement," Meier says. "In a business like this, you want your equipment to be like a toaster or a refrigerator. You just turn it on and it runs."

In terms of storage, Meier reports that the four ATABoy2 disk

arrays, based on the ATA disk interface, fit his stringent requirements, as they are in nearly continuous operation. "Out of all the disk arrays we've used, we've had the fewest number of problems with those units," says Meier.

Meier also relies on the performance of automated tape libraries from Qualstar, which Stargate uses for routine backups in conjunction with Veritas's BackupExec software. The libraries are stored on Sony's Super AIT (SAIT) format tapes, each of which holds 500GB of uncompressed data. With the Sony tape drives, Stargate Digital routinely achieves sustained backup rates of 1.8TB/min. "We are reaching the theoretical maximum throughput of almost 30MB/sec," says Meier.

As Stargate's workload continues to grow, Meier is confident that the studio's current mix of IT systems, storage, custom software, and tracking systems will keep the digital content flowing smoothly. In fact, he sees the ability to move data efficiently as an instrumental part of Stargate's success. "In the past three to four years, the amount of work here has increased exponentially, and one of the reasons we've been successful is that we realized early on that work flow is key." •

Storage in the Studio

By Michele Hope

Growing Pains

Documentary producer turns to disk arrays to handle rising storage needs

Going from garage-style start-up to producer of TV documentaries for stations such as The Discovery Channel and Fine Living can cause a few growing pains along the way. This was certainly true for Cry Havoc Productions, which had to upgrade its data storage system to keep up with an accelerating workload that now requires juggling multiple projects at the same time.

A few years ago, Dylan Weiss, now CEO and president of Cry Havoc, got together with television producer (and father) Milt and longtime film school friend Gary Copeland and launched the Venice, California-based postproduction studio, after a series of kitchen table discussions about the types of projects they wanted to create.

Today, the partners are realizing their dream, directing and editing documentaries such as *Driving Design*, a one-hour program about how cars of the future will be designed, which aired this spring on The Discovery Channel. The team is also handling production and postproduction work on documentaries that cover classic-car restoration and the history of Ducati motorcycles.

In a world where 30 to 35 tapes of raw film footage for one documentary can consume as much as 800TB of disk space, Weiss says it's vital to have a storage system that's up to the task. And when it came to learning about the types of disk storage that can best support rapidly growing production requirements, Weiss had plenty of challenges along the way.

Back in his college days, Weiss used an Apple Macintosh system for film editing and production. For storage, he used disk drives based on the FireWire interface, which features a high-speed serial bus capable of moving large amounts of data from computer to disk. Unfortunately, he experienced a number of drive failures, often at critical times, and a subsequent lack of support from the supplier. Weiss also noticed that as the FireWire drive neared capacity, performance suffered. "I couldn't fill it up past 15GB," he says, "or it would slow down considerably."

When selecting a storage system to meet Cry Havoc's Apple Final Cut Pro-based video editing setup, the team chose Huge Systems' SCSI-based 1.2TB MediaVault disk arrays based on a faster, latest-



Image courtesy Cry Havoc Productions, Inc.

generation SCSI interface. After the studio optimized the array for high-speed transmission of film footage, Weiss began to notice improvements in the studio's over-

all workflow. For example, he was able to run multiple streams of standard-definition (SD) video for editing, effects, color correction, resizing, and so forth. He was also able to take advantage of improved rendering performance. "One thing that speeds up my work flow in the editing stream—where I'm pushing deadlines and doing real-time effects on multiple pieces of video—is that I no longer have to wait for things to render. I simply hit Play and see the effects run in real time."

Because Cry Havoc shoots and edits in SD, it only needs to process each 2K frame at between 28MB/sec and 32MB/sec, as opposed to the 120MB/sec to 180MB/sec required for HD footage. Since installing a Pinnacle CineWave HD-capable video capture card and an HD-capable disk array, the team has used the resulting boost in array performance to further streamline the editing process.

In just over a year, Cry Havoc has grown from one disk array to four. The studio now has two 1.2TB MediaVault U-320R Max (single-channel) disk arrays and two 1.2TB MediaVault U-320S Dual Max (dual-channel) arrays from Huge Systems. The devices are based on the latest-generation SCSI interface—Ultra320 SCSI, which is theoretically capable of transmission speeds of up to 320MB/sec per channel. The supplier claims that the storage subsystems are optimized for non-linear and high-bandwidth applications—such as HDTV, uncompressed broadcast video storage, content creation, and other high-performance applications—and that the arrays can be scaled up to 2.5TB per system and include dual SCSI channels.

Besides faster access speeds, reliability is crucial. "By the time a project wraps," Weiss says, "that 1.2TB system has everything that went into the show on it. It's of paramount importance for the disk system not to crash, for the data not to get corrupted, because you

Digital postproduction studio Cry Havoc relies on new-generation Ultra320 SCSI-based disk arrays for its storage needs while producing TV documentaries such as *Driving Design* (above) for The Discovery Channel.

have a lot of original material on there that doesn't exist on videotape." Weiss, who typically puts about 800GB of raw film footage on a 1.2TB array, notes that it's not uncommon for the array to remain filled to capacity for four months or more until a documentary is completed.

To safeguard the data, Cry Havoc uses each pair of disk arrays to store footage from different documentaries, assigning one array for primary storage and the second for redundant storage. The studio backs up all changes nightly to the second array. Weiss notes that routine backups—which used to take all night with his previous disk systems—can now be completed via the SCSI connection in a few hours.

Technical support has also been essential to Cry Havoc, most notably with respect to a quirky incompatibility issue between the SCSI version on the array and a recent Mac operating system upgrade. The problem, which froze access to storage, arose 10 days prior to Cry Havoc's final delivery deadline of its first documentary for the Fine Living network. To address the problem, Huge Systems dispatched a technician, replaced the drive, and in just under two days, the studio was back in business.

Despite rapidly evolving technologies in the storage market, Weiss thinks that the studio's current storage configuration will be good for at least the next year. "Every year, there are new drive formats, new standards, and faster data rates. It's hard to say that the Apple G5 system we bought is going to be viable for us next year. There will be something bigger and faster, and we'll probably need it. But one of the things in our edit suite that won't change is our disk system." •

Michele Hope is a freelance writer and owner of TheStorageWriter.com. She can be reached at mhope@thestoragewriter.com.

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ANIMATION

SoftimagelXSI 4

Softimage expands the feature set of XSI, bolstering productivity

By George Maestri

Version 4 is likely the most substantial upgrade Softimage|XSI has seen, and the new release contains a wealth of new features and improvements that adds significantly to the depth of the software.

One new feature is the competitive price. The costs of XSI Advanced, Essentials, and Foundations have been cut by more than half. The three packages sport incrementally more features, with Foundation having enough power to tackle most basic design and game animation work. XSI Essentials adds subdivision surfaces and advanced character animation, as well as soft- and rigid-body dynamics. XSI Advanced has the full feature set, including a superb new cloth module by Syflex—probably the most realistic cloth simulator on the market today.

XSI installs fairly easily, but it is the first package I've seen in a while that still requires a dongle. Users will find the interface essentially the same as the previous version, but with some nice enhancements. Customization is made easier with advances in user-defined layouts. Layouts are XML-based, making resizing windows and customizing the interface easier. A new organization feature, Shelves, enables users to store models, textures, sounds, and other assorted media in a floating window. Ghosting is significantly improved; users can ghost even complex tasks, such as simulations.

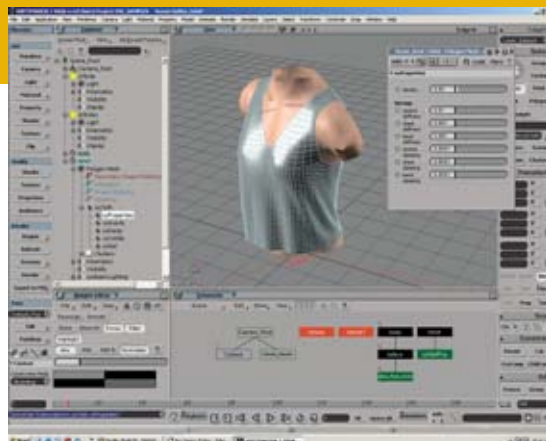
An interesting interface feature, Custom Display Host allows users to run virtually any third-party application within XSI. It's particularly useful for game designers who want to test games within a viewport.

Softimage has incorporated a 2D paint engine in XSI. Housed in XSI's built-in compositor, the paint engine supports vector and raster paint—great for doing anything from wire removal to creating textures. Although the paint tools are not as robust as those in Adobe's Photoshop, brushes and parameters can be animated, allowing for lots of great effects.

Rendering in XSI is improved by Mental Ray Version 3.3, which offers faster motion blur. Another bonus, Softimage doubled the amount of Mental Ray render nodes that ship with the package. Interface improvements include a mode that allows for quick rendering of final gathers, improving work flow for those using global illumination.

One of the best new rendering features is the ability to create materials libraries. Materials can be organized in groups, making them easier to store and transport. More important, the XSI interface finally allows for shaderballs, something users have been wanting since Version 1.0. Another new rendering feature is a nice UV Unwrap tool that makes texturing polygonal objects easier.

The addition of rigid-body dynamics allows for real-world physics to control the behavior and animation of objects. The implementation is fairly straightforward, with objects subject to forces such as gravity and wind. Objects can have mass, elasticity, and friction, among other parameters. After initial conditions are set, you can set the simulation in motion for realistic results.



Softimage|XSI 4 includes a license for SyCloth, Syflex's superb cloth module.

XSI's character animation tools have seen improvement over their already stellar implementation. XSI includes a number of pre-built character rigs, which are now more customizable. Fingers, toes, and even ears can be added with a few mouse clicks. Standard rigs also can support user-defined splines to assist in facial animation. Control splines can be rigged to simulate skin sliding by using curves to indicate where a character's face deforms.

Animating in XSI has always been easy, with the most advanced non-linear animation timeline on the market. New to XSI is timeline-based editing. Several animation editors are combined in the same window so users can work with multiple editors on the same scene. Animation can be edited using curves, clips, or a dope sheet—all from the same window. It is an easier way to organize the work flow for the animator.

Modelers and animators will appreciate Construction Modes. Artists can go back to the base version of a character and add more details, without destroying the subsequent phoneme and facial shapes built onto the original character, for example.

The interface improvements aid in productivity, the character animation tools are top-notch, and the rigid-body dynamics help the package expand into areas such as special effects. Softimage XSI 4.0 is a robust and capable package with a deep feature set. ■

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

SoftimagelXSI 4

Price: \$6995 for Advanced, \$1995 for Essentials, \$495 for Foundation

Minimum System Requirements: Windows 2000/XP Pro or Red Hat Linux 7.3, 8.0, 9.0, or Enterprise Version 3; AMD K7, Intel Pentium III, or higher processor; OpenGL accelerated graphics card; 520MB of hard-disk space; and 256MB of RAM

Softimage
www.softimage.com
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VIDEO

Premiere Pro 1.5

The latest version of Adobe's NLE premieres on Windows

By David Singer

Although Mac users won't benefit from this upgrade, PC-based video editors will be thrilled with Adobe's latest release, Premiere Pro 1.5. Premiere Pro's many new features include support for all standard HD resolutions (480p, 720p, and 1080i), Panasonic 24p Advanced, Bezier keyframes, and AAF and EDL import and export. These traits, as well as tighter integration with other Adobe programs and its continued ease of use, make Version 1.5 worthy of a closer look.

Taking a hint from Adobe Photoshop, Premiere Pro 1.5 includes four filters—Auto Levels, Auto Color, Auto Contrast, and Shadows and Highlights—to help speed work flow. Auto Levels, Auto Color, and Auto Contrast enable editors to make color and contrast adjustments with the click of a button, whereas the Shadows and Highlights filter intelligently corrects overexposed or underexposed video to maintain a proper exposure. Yet, as with any such correction, you won't be able to restore detail that isn't in the original file.

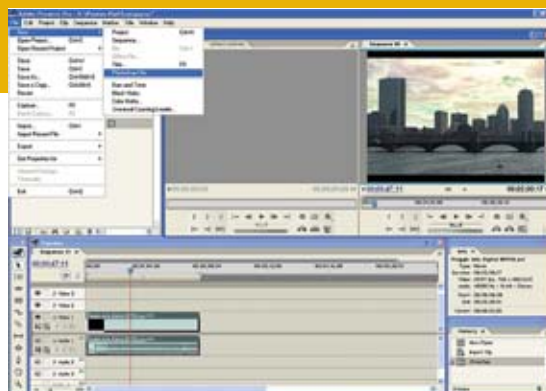
In Version 1.5, you can make custom presets and recall them in future projects. Once you have set the parameters for your effect, you can save them as presets under the Effect Controls menu and organize them in new Favorites folders or bins.

Adobe also has expanded the audio capabilities of Premiere Pro. With a new Snap on Sample feature, you can much more precisely edit audio in Premiere Pro

1.5. Using Snap on Sample, you can edit audio at the sample level within a frame of video, and then automatically snap audio edits to the same level. Also included in the upgrade are two new audio filters, DeHummer and DeEsser. These new plug-ins remove unwanted hum and hiss, such as that introduced by low-quality cables, to deliver truly professional results.

Adobe Premiere Pro 1.5 boasts tighter integration with other Adobe products than ever before. You can launch Photoshop CS (available separately or included in the Professional Version of the Adobe Video Collection) from within Premiere Pro 1.5 by simply selecting File, New, Photoshop File. After Photoshop automatically launches, your image will open in the correct resolution and aspect ratio. When you're finished editing in Photoshop CS, simply close the program and the edited version of your image will appear in your Premiere Pro project. And for users of Adobe After Effects, Premiere Pro 1.5 will automatically examine the After Effects plug-in folder. All compatible plug-ins therein automatically become available directly within Premiere Pro.

Noticeably absent from Premiere Pro 1.5, as well as the rest of the Adobe products, are work flow enhancements related to networking. Although Premiere Pro is



Thanks to improved integration with other Adobe applications, I quickly and easily moved between Premiere Pro and Photoshop CS, where I was able to edit and color-correct images in the accurate resolution and aspect ratio.

a solid NLE, I would like to see such features as network rendering added to the application, as well as to After Effects and Photoshop CS.

As with Photoshop CS, the latest version of Adobe Premiere Pro requires activation, a process that proved quick and painless. Without activation, Premiere Pro 1.5 will cease to function after a 30-day grace period. Adobe's user license, and activation scheme, allow for two activations—one each on a primary and secondary computer—as long as the installations are not used concurrently.

Despite the fact that the NLE market is crowded and competitive, Adobe continues to expand on its already powerful Premiere Pro offering. Version 1.5 is a top-level NLE worth serious consideration by any video editor. I tested the upgrade on three workstations: one a 2.26GHz Pentium 4 system with 768MB of RDRAM, another a 2.8GHz Pentium 4 computer with 512MB of DDR memory, and a 2.0GHz Pentium 4 laptop having 512MB of DDR memory. Premiere Pro 1.5 ran admirably on all of them.

Premiere Pro 1.5 is powerful, flexible, and highly stable. I highly recommend it to new and seasoned users alike. #

David Singer (*singercreativeservices@charter.net*) is a founding partner of Singer Creative Services offering digital photographic, video, and other services.

Premiere Pro 1.5

Price: \$699 for the full version, \$99 as an upgrade

Minimum System Requirements: Intel Pentium III 800MHz processor, Microsoft Windows XP, 256MB of RAM, 800MB of hard-disk space, a Microsoft DirectX-compatible sound card, a CD-ROM drive, CD recorder (CD-R/RW), DVD recorder (DVD-R/RW+R/RW), 1280x1024 32-bit color video display adapter, OHCI-compatible IEEE 1394 interface, and a dedicated 7200 RPM UDMA 66 IDE or SCSI hard disk

Adobe Systems
www.adobe.com
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ComputerGraphics World

The Magazine for Digital Content Professionals

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COMPOSITING

Curious gFx Pro 2.5

The new 16-bit version performs admirably under test conditions

By Frank McMahon

Curious Software ups the ante with an update to its desktop compositing program, gFx Pro. Curious gFx Pro 2.5 is suitable for painting, animation, rotoscoping, and digital effects for film and television, in up to 6K resolution and full 16 bit.

For those unfamiliar with the company and the program, Curious Software's claim to fame has been, up to this point, Curious World Maps software, a leading broadcast map-creation program. The company has employed much of that popular program's feature set in the creation of a desktop compositing program somewhat similar to Adobe After Effects and Discreet Combustion. Curious gFx Pro 2.5 falls into generally the same price category of those programs. The 8-bit version is priced at \$999, while the 16-bit version runs \$1999.

Installation is quick and easy, and copy protection is ensured via an Ethernet-linked license file on your machine or a dongle. Curious is very protective, whereas vendors, such as Discreet and Adobe, have loosened their copy protection in recent years through the elimination of dongles, for example. Curious's tight control could adversely affect its market share, as it often inconveniences and annoys legal users.

After gFx Pro is launched, the main screen opens with all your tools in full view. This seemingly simple characteristic is perhaps the best feature a compositing program can offer. Viewing footage with your tool set surrounding it, rather than having

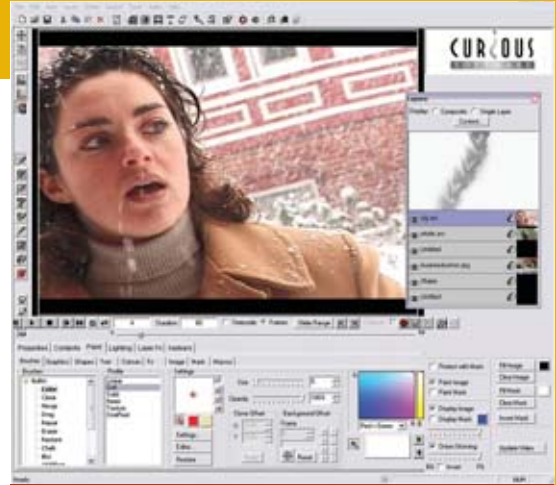
features buried in sub-menus and alternate windows, is invaluable, and key to a productive work flow.

The top row, above your footage, includes buttons for loading various elements, such as video, images, text, and shapes. To the right appear stacks of layers. The program excels at masking and having layers interact with one another, so having them on screen at all times is handy for manipulation. At the bottom of the interface are various playback controls, as well as multiple tabs for adding painting, lighting, and layer effects and for altering content on screen. Each layer can be composited with other layers in different ways. You can position, scale, and rotate a layer; adjust transparency; matte out a section; rotoscope a matte; choose a blend mode, such as dodge, burn, subtract, and pin light; and add trails and drop shadows.

Animators will love the many Paintbox features, including onion skinning and wire rig removal. In fact, it's safe to say that while other compositing programs are dedicated to adding footage effects, gFx is geared more toward roll-up-your-sleeves, pixel-pushing work—animating items and removing objects that need to be deleted. Most impressive are the program's tracking controls, which are crucial to any animator. The automatic tracking is amazingly easy to produce and adjust. After a quick glance at the man-

ual, in fact, I was able to track a graphic to a motion path I created in roughly one minute.

As for new features in this 2.5 update, viewer guides are included for various aspect ratios, cached frames play back faster and more efficiently, B-spline shapes have



In gFx Pro's main work space, all of the tools are accessible via tabs, which improves the creative work flow.

more control options, and keycode info exports with Cineon frames. Moreover, Restore Brush brings back your animated brush with a single click, RAM playback is adjustable, a new smoothing algorithm has been added to motion paths, and shapes can now be grouped in a tree hierarchy.

Curious's gFx Pro 2.5 has much to like, yet I was a little disappointed with its video card compatibility, consisting of only a few boards (Decklink and DPS). And while it works with QuickTime-compatible I/O cards, I'd like to see compatibility with FireWire output or 3D GL video for the program to be used with a dedicated monitor.

Technical support, via e-mail only, costs \$150 per year. I wish Curious would include free basic support. I can't comment on the quality of the support, because I did not require any assistance—a good thing.

The program's polished interface, similar to Discreet's Combustion, puts everything right in front of you and one quick click away. The learning curve is not steep; after going through a few of the included tutorials, you can figure out most of the program's features. If you are into pixel work, animating, motion tracking, keying, and rotoscoping, Curious gFx is a solid piece of software with a great interface. ■

Curious gFx Pro 2.5

Price: \$999 for the 8-bit version, \$1999 for the 16-bit version

Minimum System

Requirements: Windows NT 4, 2000, or XP with the latest service packs or Mac OS 10.2.3; a Pentium III 700MHZ or equivalent or G4; 256MB of RAM, and 1.3GB of hard-disk space

Curious Software
www.curious-software.com
infoNOW 130

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.

A Graphic Arts Contest From Computer Graphics World:

What's in your
Dreams?

As the magazine of innovation in visual computing, *Computer Graphics World* has a rich history of recognizing what's new in the digital arts. Now we are proud to put the spotlight on the future: the talent and imagination of student artists and animators. To showcase the creativity of this new generation, we are pleased to announce a student art contest for the Fall of 2004, titled "**What's in Your Dreams?**". Open to anyone enrolled in a college-level program, the contest seeks to identify the most promising new digital artists and reward them with prizes and recognition.

When to Enter:

The contest begins September 15 and closes November 15, 2004. The awards will be announced in March 2005, and the selected images will be featured in *Computer Graphics World*.

What to Enter:

Any digitally created or enhanced still image will be accepted that illustrates the theme "**What's in Your Dreams?**". Please do not

submit any copyrighted, trademarked, or sexually explicit images. Images will be selected and featured that are most suitable for a professional audience.

How to Enter:

Please submit your entries at our website, www.cgw.com, where you'll find instruction for uploading images. Please include your name and contact information. We are accepting JPEG files, 7 x 10 inch @72dpi.

Judging and prizes:

The entries will be judged by the *Computer Graphics World* staff and other professionals in the industry. Prizes include graphics software, a workstation, design software, and more. Plus, the selected images will be featured in *Computer Graphics World*.

More information:

Complete contest information can be found at:

www.cgw.com

Workstations

By Courtney E. Howard, Senior Technical Editor

Intel recently unveiled its latest innovations, including Xeon processors with Extended Memory 64-bit Technology (EM64T), triggering a number of announcements from industry-leading workstation vendors. Moreover, Intel's PCI Express graphics bus is gaining popularity, and finding a home in the latest workstation offerings from industry-leading manufacturers.



Although a number of mobile workstations targeted at content creators have

come to market, this page concentrates on the latest releases in the desktop workstation arena. For more information, visit www.onlinecenter.to/cgw.

Hewlett-Packard

Hewlett-Packard has launched three new personal workstations: the xw8200, xw6200, and xw4200. All three models boast the company's latest advancements, including an innovative tool-less design for faster service and improved acoustics via new quiet fan technology. Able to run 32- and 64-bit versions of



Windows and Linux, the xw8200 and xw6200 boast the Intel Tumwater chipset, Intel Xeon processors with EM64T, and PCI Express technology.

Hewlett-Packard; www.hp.com

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Verari Systems

Verari Systems, formerly RackSaver, unveiled its latest graphics workstation: the NemeSys X64 during SIGGRAPH 2004 in Los Angeles last month. Attendees were among the first to witness Verari Systems' new dual-processor workstation designed for creative and technical professionals. The NemeSys X64 boasts 64-bit Intel Xeon processors, Intel EM64 Technology, and a PCI Express Nvidia graphics card. For more specifics about the NemeSys X64, turn to pg. 4.

Verari Systems; www.verari.com

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Dell

Dell has launched the Precision 470 and 670, which employ Intel Xeon processors with EM64T. Able to power 64-bit as well as 32-bit programs, the company's new dual-processor-capable systems incorporate DDR2 memory and the PCI Express bus to ensure heightened performance and future scalability.

Dell; www.dell.com

infoNOW 132

Boxx Technologies

Boxx Technologies has introduced its 4200 and 8200 series of digital content creation workstations. For 2D, 3D, and digital video, the 4200 family offers single-processor Pentium 4 systems. The 8200 series, designed for animators and video editors, boasts Intel Xeon-based, dual-processor configurations.

Boxx Technologies; www.boxxtech.com

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Alienware

Alienware has announced the MJ-12 3100 workstation based on the Intel Tumwater chipset, PCI Express, and DDR2 memory. The MJ-12 can accommodate up to two high-performance video cards; as a result, it can support four displays. Starting at \$1935, the MJ-12 3100 includes the Nvidia Quadro FX4000 graphics card and a choice of high-end software and hardware options, including a 400Gb hard drive. The new release is optimized for digital content creators with a large amount of space, high processing speed, and cutting-edge software and hardware components.

Alienware; www.alienware.com

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Apple

Apple has premiered the Power Mac G5, equipped with a 64-bit desktop processor and 1GHz front-side bus. The workstation, powered by the PowerPC G5 processor from IBM and Apple, features 64-bit processing technology, enabling users to benefit from memory expansion (up to 8Gb) and 64-bit computing. The Power Mac G5 is available now in three configurations.

Apple; www.apple.com

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IBM

IBM has infused its ThinkCentre A51p workstation with a tool-less enclosure, front airflow cooling, IBM Rescue and Recovery, and the IBM Embedded Security Subsystem. The new model incorporates the Intel 915G Express chipset, a Pentium 4 processor, standard Gigabit Ethernet, DDR2 memory support, and a 16-lane PCI Express graphics bus with an ATI graphics adapter.

IBM; www.ibm.com

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products

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

www.onlinecenter.to/cgw

SOFTWARE

PREVIZUALIZATION

RealViz for Previz

Win RealViz announced two innovations during SIGGRAPH in Los Angeles, StoryViz 1.0 and ImageModeler 4.0. Interactive 3D previz software, StoryViz aids directors, visual effects supervisors, 3D animators, graphic artists, and filmmakers in planning each film scene in detail and in real time. Based on a 3D rendering engine and non-linear editing tools, StoryViz links storyboards and film production by not only simulating the shooting phase, but also supporting the pre-editing of the final shots. StoryViz 1.0 runs on Microsoft Windows 2000 and XP. The latest version of RealViz's image-based 3D modeling software, ImageModeler 4.0, boasts a new 3D/2D Integration tool for incorporating 3D projects into 2D photos. The new UV Mapping Editor assists users in the UV mapping of textures, whereas Snapshot enables the exportation of a 3D scene as a JPG file. ImageModeler 4.0 is available for Windows 2000 and XP systems at a cost of \$1380.

RealViz; www.realviz.com

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ROTOSCOPING

Silhouette News

Win • Mac • Linux Silhouette FX unveiled the first release in a new family of products, Silhouette+roto. Created by artists, the new rotoscoping solution offers OpenGL-accelerated rendering and real-time shape preview, integrated motion trackers, variable edge softness, and the importation of shapes from Elastic Reality and Commotion. Silhouette's latest offering provides fully animatable shape tools with which to move, scale, rotate, and warp points, shapes, and groups of

shapes. Silhouette+roto is available as a plug-in to Adobe After Effects, Apple Final Cut Pro, and other host applications for \$395, or as a stand-alone application for Windows, Mac, and Linux operating systems for \$495.

Silhouette FX; www.silhouettestfx.com

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COMPOSITING

Now with Nuke

Win Boxx Technologies has entered into a co-branding agreement with D2 Software, makers of the award-winning Nuke compositing and effects software. Nuke 2D and 3D digital compositing software assists users in combining and manipulating scanned film, video plates, and computer-generated imagery. As a result of the new relationship, the companies will offer postproduction and visual effects professionals a high-performance, turnkey digital compositing system that combines Boxx's hardware technology and D2 Software's Nuke.

Boxx Technologies; www.bboxtech.com

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VIDEO

Speeding Chromakey

Reflecmedia unveiled Mattenee, a new plug-in for today's non-linear editing and compositing applications, during SIGGRAPH. Priced at \$395, Mattenee is designed to speed and simplify the chromakey process.



Developed by The Pixel Farm, Mattenee 1.0 works with such popular digital video programs as Apple's Final Cut Pro and Shake, Adobe's Premiere Pro and After Effects, and Eyeon's Digital Fusion. The Mattenee one-click chromakeying solution employs an algorithm that recognizes specific blue and green light generated by Reflecmedia's LiteRing, ensuring fast and accurate keying results.

Reflecmedia; www.reflecmedia.com

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HARDWARE

STORAGE

FireWire File Storage

Iomega, a leader in data storage, has introduced a new model in its family of Iomega Rev drives. The Iomega Rev 35GB FireWire drive achieves read and write speeds of up to 25MB/sec. Housed in a white and light grey enclosure, the drive features drag-and-drop



random access technology and a software bundle that boasts Symantec Norton Ghost for Rev, Dantz Retrospect Express for the Mac, and Iomega Automatic Backup Pro for PC users. Now shipping for Mac and PC systems, the Iomega Rev 35GB FireWire drive ships with one Mac-formatted disk at a cost of \$399.99. Separate disks, providing 35GB of data storage, are priced at \$59.99 each.

Iomega; www.iomega.com

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products

events

SEPTEMBER

9–13

IBC2004 Conference

held in Amsterdam. Contact International Broadcasting Convention (IBC), 44-0-20-7831-6909, www.ibc.org.

OCTOBER

23–30

2004 Savannah Film Festival

held in Savannah, Georgia. 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), 301-694-5243, www.ctia.org, www.wirelessit.com.

STOCK OPTIONS

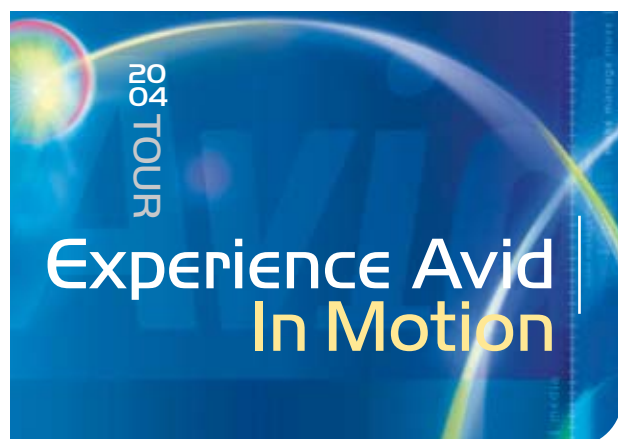
BROADCAST-READY AND ROYALTY-FREE

Producer of broadcast-ready, royalty-free animation and special effects, Hypereye Motion Graphics has announced the availability of a whole new line of commercial-grade, royalty-free animation. The company offers animations designed from the ground up with NTSC legal saturations and luminance levels. And pre-fielded sequences ensure drag-and-drop functionality. Designed for legal and political advertising and programming, *Legal Presentations* includes legal-themed animated backgrounds, effects, and double-loop-donut backgrounds. Double-loop donuts combine two backgrounds in one and incorporate an effect in the middle. Other new titles for the video production and commercial broadcast industries include *Ultimate Globes*, *Stars & Stripes*, and *Christmas*. Hypereye Motion Graphics' files are formatted as QuickTime files and meet NTSC standards for color, contrast, and motion.

Hypereye Motion Graphics;

www.hypereye.tv

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Arena Maxtronic Professional RAID Solutions

We make RAID solutions easy...

companyprofile

Arena-MaxTronic, Inc. founded in 1995, is a dedicated maker of top-of-the-line, user-friendly and cost-effective RAID solutions. Our team of seasoned professionals has wide-ranging know-how in the information-technology industry and over 10 years experience in manufacturing, sales, marketing, and distribution of disk-array technology. With a wide range of storage solutions for any computing platform and operating system, high quality technical support, as well as fast product deliveries, Arena-Maxtronic brings freedom of choice to all clients, from entry-level workgroup to enterprise-class RAID solutions. Our RAID systems integrate the leading edge hardware and firmware technology to deliver high performance and reliability for applications demanding performance, extreme fault tolerance, data availability, easy configuration, and management flexibility all in one RAID solution.

companysupport

Our staff here at Arena Maxtronic believes that the foundation of a successful business begins with quality customer relations. This is why each call is answered by an extensive team of service and support representatives. Arena MaxTronic not only focuses on product sales, but we also realize the importance of a company backed by friendly customer service. At Arena Maxtronic, you can expect peace of mind that goes along with purchasing a storage system for your companies data.

companymission

Our goal is to provide users with a high-performance, user-friendly and super-affordable RAID solution. We strive to offer users who demand exacting performance and data-protection, a company propelled by a unequivocal committed service. We assure that painstaking attention has been paid to all the engineered parts, including chassis, drive trays and controller-electronics. Arena MaxTronic will continue to sharpen and broaden our distributions to become a vital tool in enhancing customer's corporate profitability. We will be a company that can forge strong relations with it's partners, suppliers, and open source initiatives. With clients from all over the world, our sharp focus on meeting clients' needs are unmatched.

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- Full programmability

Wildcat Realizm 100

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- 256 MB
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Background

Infotrend was founded in 1992 by a team of engineers with extensive experience in storage subsystems. Our mission is to provide OEMs, system integrators, and select distributors with the highest performing product line available in the storage industry.

An experienced development team designs our products to be flexible, cost-effective and feature-rich, with support for a variety of protocols. Legacy support and upgrade paths make it easy for system managers to migrate as technology advances.

Innovative Products

Infotrend subsystems offer the highest levels of performance and fault tolerance in the RAID market, combined with exceptional value. All current systems support RAID levels 0, 1(0+1), 3, 5, 10, 30, 50, JBOD, or RAID.

All RAID controllers employ Infotrend's own custom ASICs, a high-speed CPU, and DRAM cache memory to achieve high data throughput and availability. They may be managed either locally or remotely via RS-232C ports/modem, the LCD front panel, in-band FC/SCSI, or SNMP.

RAID management tools include both a text-based RAID manager and Infotrend's own RAIDWatch™ a Java-based GUI manager for use in a variety of platforms, including Windows 2000/XP, Sun Solaris, and Linux.

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