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**STATE OF THE  
INDUSTRY ISSUE**

OCTOBER 2004

# gamedeveloper

THE LEADING GAME INDUSTRY MAGAZINE

▶▶ **STUDIO REDUX**

INNOVATION THROUGH  
REINVENTION

▶▶ **HE SAID, HE SAID**

HOW PUBLISHERS AND  
DEVELOPERS CONNECT

▶▶ **POSTMORTEM**

THE MULTIPLAYER GAMEPLAY  
OF BLUE RIDGE'S MOMENTUM



# 20

PUBLISHERS

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## POSTMORTEM

### 24 THE MOBILE MULTIPLAYER GAMEPLAY OF BLUE RIDGE'S MOMENTUM

Six players. Six phones. One maze. Now throw in mobile phone network latency, phone call and text message interruptions, and a 16x16 pixel limitation for character development. When the developers at Blue Ridge set out to create MOMENTUM, the company's first multiplayer mobile game, they quickly realized that their platform would hold them back if they didn't wise up to its constraints and capabilities.

By Allen Eichler

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We asked. You told. Find out which company developers said failed on nearly every promise made and which one takes the cake by being an "absolutely professional company across the board." The results from a Gamasutra.com poll, surveys galore, and financial data from the publishers are in and have been used to rank the top 20 publishers you want to work for.

By Tristan Donovan

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By Stuart Roch

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By Jamil Moledina



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# SOFTIMAGE® | XSI®

## Jun Takeuchi on XSI

“We continued to work with Softimage on **Onimusha 3** because we knew the project would require reliable support as well as leading edge technology. With its flexible character creation workflow, profound tool integration and unique Animation Mixer, **SOFTIMAGE | XSI** has significantly improved our workflow. And, of course, Softimage’s support and responsiveness continue to be assets as we push the boundaries of game design and development.”

**Jun Takeuchi**, Producer  
**Onimusha 3**

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Download a free, fully-functional 30-day trial version of **SOFTIMAGE | XSI** version 4.0 from [softimage.com/XSI](http://softimage.com/XSI)

**i am 4.** the future of animation.

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YOU CAN REACH JAMIL MOLEDINA AT JMOLEDINA@GDMAG.COM



## HEALTH METER

ONE MIGHT BE QUICK TO SAY THAT THE STATE OF the industry is strong by pointing to high sales numbers, yet many independent developers continue to get the short end of the stick. While creativity is perceived to be down, it's more prevalent that innovation is deliberately stifled in favor of the sure-thing rehash. From a more macro perspective, consolidation is rampant, both in literal terms and in the homogeneity of output. Some fear that in the industry's eagerness to be a contender, it's mimicking all the wrong things about the film, music, and yes, even media publishing industries, where five or six behemoths dictate similar content (of course, there are gentle, well-intentioned giants, such as the ones you and I work for). The features in this month's magazine speak to these issues by providing a snapshot of where we are as a business community, examining publishing opportunities, and offering some positive next steps in guiding the evolution of game development.

At the center of our coverage is our "Top 20 Publishers" feature (page 10), which, regular readers will remember, is our annual special report that analyzes and ranks our industry's gatekeepers. This year, we chose to factor in a broad range of qualitative factors such as developer feedback, cancellation rate, and game reviews, in addition to raw revenue. The integration of these developer-centric factors extends the relevance of the ranking by comparatively illustrating how income, corporate behavior, and product quality relate in our industry. Some of the changes and similarities to last year's pure revenue rankings are quite telling.

### METAMORPHOSIS

Now then, you might want to sit down for this, if you're not already doing so. While quietly minding my own business preparing this issue, the powers that be asked me to run the Game Developers Conference. I knew the position was open; it simply hadn't occurred to me to throw my hat in the ring. I even suggested several kind readers for the position. After all, I was editor-in-chief of *Game Developer*, and for the first time in my life, I loved my job. However, life has a strange way of opening doors when you least expect it. So I jumped through with both feet.

As for the beloved *Game Developer* magazine, fear not. We've hired a new editor, Alex Handy, who many of you will recognize as a recent feature contributor to this magazine and a freelance game technology writer. For that matter, we also have a new managing editor at Gamasutra.com, Simon Carless, also a writer for the magazine and the web site, and former editor of Slashdot.org. As for me, I am continuing to work closely with our strong editorial teams to ensure that *Game Developer* magazine, Gamasutra.com, and the Game Developers Conference continue to offer the greatest degree of insightful content that each division is uniquely qualified to deliver. So I'm not going anywhere.

### ACKNOWLEDGMENTS

Before I sign off, I have to express my profound gratitude to Dominic Milano. Dom was editor of *Interactivity*, *Keyboard*, and *DV*, recently lending a hand as editorial director for the CMP Game Group, before returning to run the CMP DV Group. He trusted me to go with my instincts on this magazine and run it with full autonomy, while offering sage advice born from his extensive editorial experience. Running *Game Developer* has been the most beautiful experience of my working career to date, and I owe much of it to this true gentleman.

I would be remiss if I didn't also mention the shining example provided by Jennifer Olsen, whose passions for the core disciplines of game development and grammatical correctness inspired everyone who came within range. I am also going to miss Kenneth Wong, who is leaving to write the second great Burmese novel (he's already written the first one). His Zen approach to crunch mode has often brought balance to my perfectionist bent. Of course, none of this happened in a vacuum, and I have to give credit to Hal Barwood, Jon Blow, Noel Llopis, and all our advisory board members, columnists, and contributing writers who have guided and illuminated me and the magazine.

Yet, this isn't goodbye. I'm sure I'll be seeing you all in San Francisco in March at GDC. ✨

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# Battlefield Brought to Life.



"Havok raised our game to a whole new level. The dynamic gameplay scenarios resulting from Havok physics are outstanding and have brought MCHPA to life."

**Brady Bell, Project Lead, EA LA**

"Havok enables our development teams to focus on the gameplay and not the technology. The world of MCHPA is a dynamic place. Simulating it with Havok makes it easy."

**Mark Dochterman, Technical Director, EA LA**

Check out Havok on the web at:

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## COREL GETS SLICK WITH PAINTER IX

### MINIMUM SYSTEM REQUIREMENTS

**Mac.** Mac OS X (10.2.8 or higher); Power Macintosh G3, 500 MHz or greater; 256MB of RAM recommended; mouse or tablet; 24-bit color display; 1,024x768 or greater monitor resolution; CD-ROM drive; 395MB available disk space.

**Windows.** Windows 2000 or XP (with latest Service Pack); Pentium II, 500MHz or greater; 256MB recommended; mouse or tablet; 24-bit color display; 1,024x768 or greater monitor resolution; CD-ROM drive; 380MB available hard disk space.

**COREL PAINTER, THE ARTISTS' SOFTWARE THAT** renders art through mimicking traditional mediums and tools, has upgraded to version IX (available this month), with new features such as oil paints, Brush Control palettes, and decreased latency. In the games industry, artists tend to get the most out of Corel Painter when creating background landscapes, cover art for packaging, or detailed concept art, as illustrations are 2D only.

By electronically recreating traditional fine art mediums, such as oil paints and watercolor, Painter IX gives digital artists an expansive set of tools at their fingertips, best accessed via a tablet (Corel suggests using a Wacom tablet for its accurate response to pen pressure). The tool set is further complemented by the ability to fine tune almost every detail of each tool quickly with the Brush Control palette, which, for example, can increase or decrease how much clumping your oil-paint brushes experience. When blending colors on screen, you can experiment on the canvas or a palette, play with the paint's wetness level, and tweak how fast the paint dries, allowing you to blend endlessly or add distinct layers of color.

— Jill Duffy

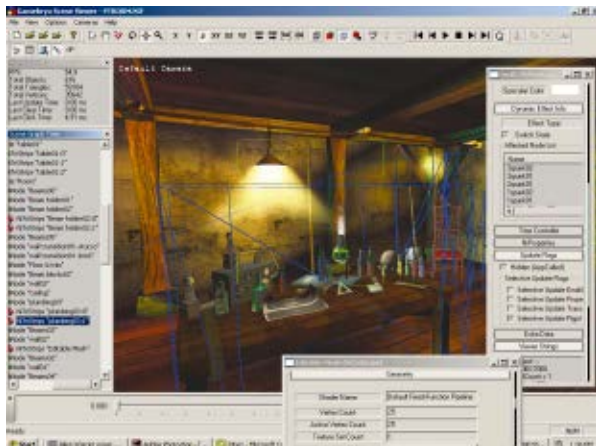


## Gamebryo Turns 1.2

**THE KEY ENHANCEMENT IN** Gamebryo 1.2 is the animation system that has been rewritten to take advantage of the new engine's capacities. The latest animation system includes general weighted blending of an arbitrary number of animation sequences with priorities—a refinement aimed at producing

more sophisticated behaviors with smaller animation sequences. The collision and particle systems also received some improvements. Upcoming games developed using Gamebryo include Sid MEIER'S PIRATES!, Firaxis's EMPIRE EARTH 2, and Mad Doc's PLAYBOY: THE MANSION.

— Kenneth Wong



### CALENDAR

#### SERIOUS GAMES SUMMIT D.C.

Loews L'Enfant Plaza Hotel  
Washington, D.C.  
October 18–19, 2004  
Cost: \$695

[www.seriousgamesummit.com](http://www.seriousgamesummit.com)

#### CTIA WIRELESS I.T. & ENTERTAINMENT 2004

Moscone West  
San Francisco, Calif.  
October 25–27, 2004  
Cost: \$545 and up  
[www.ctia.org](http://www.ctia.org)

#### THE STATE OF PLAY, CONFERENCE

New York Law School  
New York, N.Y.  
October 28–31, 2004  
Cost: \$250–\$350, and "scholarships" available

[www.nyls.edu/stateofplay](http://www.nyls.edu/stateofplay)

#### THE BILLBOARD DIGITAL ENTERTAINMENT CONFERENCE & AWARDS

The Regent Beverly Wilshire  
Beverly Hills, Calif.  
November 4–5, 2004  
Cost: \$175 and up

[www.digitalentertainmentawards.com](http://www.digitalentertainmentawards.com)



For more news and information, including a feature on game developers pursuing serious games applications, visit [www.gamasutra.com](http://www.gamasutra.com)



# Super Genre Breakout

Based on Total U.S. Units

PC Games Unit Volume %

	JAN-JUN 2003	JAN-JUN 2004
ACTION	5	4
ADVENTURE	5	6
ARCADE	2	2
CHILDREN'S ENTERTAINMENT	12	9
FAMILY ENTERTAINMENT	10	12
FIGHTING	0	0
FLIGHT	3	3
RACING	4	4
ROLE-PLAYING	8	9
SHOOTER	13	16
SPORT GAMES	6	6
STRATEGY	27	25
OTHER GAMES/COMPILATIONS	4	4

Source: 2004, The NPD Group/NPD

## FLASHBANG TO MAKE A SPLASH IN ADULT SWIM

**FLASHBANG, A SMALL INDEPENDENT STUDIO KNOWN FOR CASUAL GAMES,** won the IGF 2004 Project Goldmaster award sponsored by AOL and Cartoon Network. They have been contracted to build a game based on a show from *Adult Swim*, Cartoon Network's late-night lineup targeting more mature audiences. According to Flashbang, they have picked a concept for production from four possible game scenarios, and additional documentation, concept art, and a playable prototype are on the way to Cartoon Network. The game is slated to debut in Q3 2004.

— Kenneth Wong

## A DISTURBANCE IN THE FORCE

**IN AUGUST, A LITTLE OVER A YEAR AFTER LAYING OFF 29 STAFF MEMBERS,** THE San Rafael, Calif.-based LucasArts was forced to trim its force by 31 more people. After the resignation of longtime LucasArts president Simon Jeffery, Lucasfilm vice president Jim Ward stepped into the vacated spot in May 2004. According to a recent LucasArts press release, after a "hard, critical look" at the business, Ward concluded that the company needed to "make some fundamental changes." LucasArts also declares that it will be "concentrating on fewer titles." As part of the restructuring, Ward appointed Peter Hirschmann, who worked on *SECRET WEAPONS OVER NORMANDY*, as vice president of product development, to oversee both external and internal development. It's unclear exactly which titles will be affected, but a game based on *Star Wars: Episode III: Revenge of the Sith* is being outsourced to The Collective.

— Kenneth Wong



## CONSOLIDATION NATION

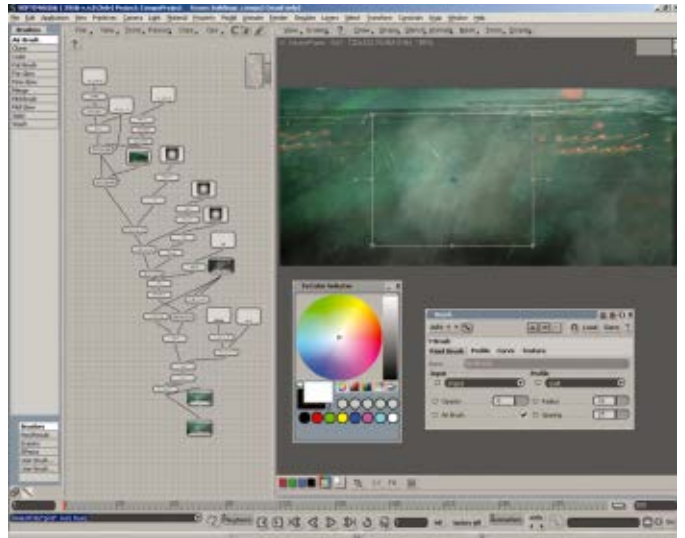
**AROUND SIGGRAPH, ALIAS AND KAYDARA** announced that the Maya provider was acquiring the MotionBuilder provider. At the show, Alias president Doug Walker was quite up front about his company's expansion plans, declaring that "growth by acquisition" was a key element of his vision. To allay developer fears, he also made it clear that Kaydara's product line would remain the same, complete with support for Maya's competitors such as 3DS Max. Following the announcement, we caught up with Kaydara's president Michel Besner, who will probably be an Alias vice president by the time you read this. "We would have been head to head three years from now," said Besner. "We're a company of 60, they're a company of 500—it's high risk." While borne from practical concerns, Besner says that developer response to the merger has been positive, since the acquisition ensures that MotionBuilder will continue to be actively supported by one of the industry's leading tool providers.

— Jamil Moledina

## SOFTIMAGE XSI 4.0

JUSTIN LLOYD

Painting textures in XSI with the integrated hierarchical vector-and-raster paint tool: As you manipulate a texture in the right pane, the hierarchy of the operations are displayed in the left pane.



### XSI 4.0

PRETTY SLICK +

#### STATS

**Softimage**  
3510 St. Laurent Blvd.  
Montreal H2X 2V2, Canada  
www.softimage.com

#### PRICE

XSI Foundation 4.0 (\$495); XSI Essentials 4.0 (\$1,995); XSI Advanced 4.0 (\$6,995); XSI Advanced Academic 4.0 starting at \$175.

#### SYSTEM REQUIREMENTS

Windows 2000/XP Professional or Linux, Pentium III or AMD K7, 500+MB of hard disk space, 1,280x1,024 screen resolution (dual monitors at 1,920x1,200 makes everything feel less cluttered), 256MB RAM (try 1GB+ for any scene of a decent size), OpenGL-accelerated graphics card.

#### PROS

1. Provides a Platform Developer Kit for connecting XSI to a Microsoft Xbox.
2. Better integration of workflow tools.
3. Current release offers far more to game developers than ever before.

#### CONS

1. The Custom Display Host feature still feels like an early product.
2. 2D painting tools are not yet up to the level of something like DeepPaint.
3. Not as well supported by third party tools and books compared to competing products.

### SOFTIMAGE XSI HAS ALWAYS BEEN

pitched as a very high-end (with a high-end price point, too) 3D animation package, mostly used for film. The tools in Maya and 3DS Max are just more mature when it comes to the vagaries of game development. Perhaps it was just my personal experience, but when I looked at its prevalence in game development, XSI was almost nowhere to be seen outside of boutique art houses that use it for high-end cut scenes. The lack of exposure was caused mostly by the price point, but a lot had to do with Softimage's lack of attention to game developers. Now, it appears that the company is attempting to redress the balance with a more amenable pricing structure and a feature set to woo game developers.

I've been a Softimage user for nearly 10 years, having formally trained on it using SGI Indigo hardware before the release of the first XSI version, so it's a package that over the years has become as comfortable to me as Microsoft Developer Studio. I have a lot of history with this software and really know my way around it, so I wasn't expecting too much from a half-version update [I've been making use of XSI 3.5 since November 2003]. According to Softimage, XSI 4.0 is the biggest update to the application since Version 1. I find myself mostly agreeing with that claim. It's very different. Different is good (this time). XSI 4.0 adds dozens of big new features—far too many to cover in this review, so I'll concentrate on what's important to game developers.

#### FEATURES FOR GAME DEVELOPERS.

Let's start with the user interface—massive changes. All your layouts and panels can now be customized and, most importantly, saved (actually as XML, but that's just a nice feature). This is quite a departure from earlier versions,

especially from the early days where almost everything was nailed down and you couldn't move it around. Along with the customization aspects, XSI adds a lot of workflow features, notably the concept of media shelves, where you can store all the items you're using—models, textures, scripts, shaders—in a particular scene for quick access. The concept is that you reach up to the shelf and take down what you need for a particular part of the scene. This is one of those subtle interface changes that you don't realize how handy it is until you've used it.

There's also a per-scene table of contents that lists all the shaders, scripts, objects, textures, and other elements in a human- and machine-readable form so that asset lists can be tracked, parsed, and manipulated.

The days of having to use a low-resolution stand-in object when animating dozens of highly detailed objects that bring your machine to its knees even in wireframe mode are over. You now have the option to use low-resolution reference objects in place of the actual geometry. Finishing the workflow by naming a reference object and the actual object identically and then swapping one for the other (hoping that you got all the appropriate instances) when you wanted to do a final render is no longer the chore it was.

XSI also applies the same idea to textures, utilizing low-resolution proxy images that load faster and can be manipulated quickly when you're blocking out the movement in a scene or tweaking a pose. The technique also

applies to shadows, using low-resolution stand-ins for performing rapid lighting-calculations on highly detailed objects.

XSI adds a vector and raster painting tool that lets you paint directly on textures, single frames, or videos, allowing quick touch-up work without resorting to an external art package such as Adobe Photoshop. The solution is reasonably robust and feature-rich, especially for frame-by-frame tweaking that can be a real chore in other packages. But it is no Photoshop.

Compositing has been overhauled with new tools for handling tracking and pinning along with an Image Compare window for side-by-side comparison of before and after images. XGS (XSI Graphic Sequencer) is Softimage's new programmable graphics pipeline technology that allows adept programmers to implement custom rendering solutions that execute on the GPU for full scene and per-object effects.

Softimage has done a lot of licensing of other technologies with this release, notably Open Dynamics Engine (ODE), an Open Source Rigid Body Physics solution used in a number of other commercial products, though XSI is the most high-profile application to date. Check out xpend rally (<http://xr.techland.pl>) to see this engine being used in a commercial game. ODE is implemented in XSI as a plug-in, so it's possible to alter the source code, recompile, and distribute a new build to the artists within a team. I can't say whether Softimage has made use of a vanilla build of ODE or tweaked it for its specific purposes.

## OUR RATING SYSTEM :

👍👍👍👍 DA BOMB

👍👍👍 PRETTY SLICK

👍👍 SLICK

👍 SO-SO

👎 LAME

The particle system in version 3.5 was capable, though it lacked many features that game developers desired. XSI now offers attractors and repulsors to influence the flight of particles, which Softimage refers to as goals. The particle parameters along with the emitters and goals are exportable, and the entire particle system is exposed via an API that allows programmers to implement parts of the game engine to allow the artists to tune their particle systems for a particular implementation.

Along with the standard Mental Ray renderer that XSI is known for, you now receive several other options suitable for game development: the OpenGL renderer and support for DirectX 9 shaders is welcome and should prove useful for artists who will be building objects to run in a game engine. You can even apply a high-level shader language to just a particular part of the scene (tell your DirectX programmer colleagues about it).

XSI also adds polygon reduction tools that are comparable to those found in Maya 6. As you might expect, there are adjustable parameters for polygon count, angle limits, and automatic generation of multiple level-of-detail (LOD) models

for use in a game engine. Each LOD can be individually tweaked, though the automated features are still no magic wand, so artists will want to keep those low-polygon skills sharpened. XSI still supports the previous Windows scripting options such as VBScript, JavaScript, and Python and has added ActivePython for the Linux Platform.

**BE PATIENT WITH YOUR HOST.** The feature I was most excited by when XSI 4.0 was announced was the new Custom Display Host (CDH) that lets you embed other applications into a window within XSI. This can be an application such as Adobe Photoshop, a non-linear editing package, or your game engine. By making your game engine aware of the XSI object model, it is possible to send data in both directions, allowing artists to construct and place models within the game engine and then switch over to the game and fine tune the object parameters (or any other custom game parameters) that can then be sent back into the modeler. You can do all this without actually leaving XSI, which makes the application useful as a level editor as well as a modeler. CDH debuts in the current version and is still rough around the

edges. I didn't have as much time with XSI as I would have liked, but this was the feature that had me up until 3 a.m. trying to integrate my game engine. I cannot describe it as a smooth ride, though with persistence I was able to eventually get the engine to a point where it no longer took down XSI every time it exited. Yes, the problems most likely existed in the game engine, not XSI, but with the problems I had, I would have to say that you should allow plenty of time for integration, don't expect it to just happen.

**NEW KID ON THE GAME BLOCK.** The package really does absolutely everything you could want. Softimage has gone out of its way to accommodate game developers, and the new pricing structure has brought it within the realm of many development studios as a possible alternative to the two major competitors. ❖

*Justin Lloyd has more than 18 years of commercial game programming experience on almost every released platform.*



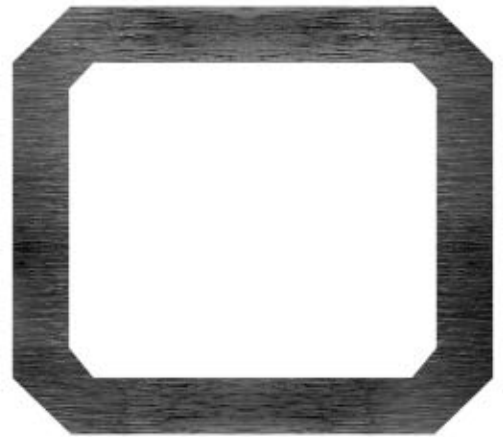
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## PUBLISHERS

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**WELCOME TO THE SECOND GAME DEVELOPER TOP 20 PUBLISHERS** guide. Over the next few pages, we investigate the ins and outs of the world's leading publishers in the hope of arming you with some useful insight into what makes these publishers tick. Whether you want to know what a particular publisher's track record on using external developers is, or their annual turnover, or their interest in original IP—it's all here.

For those who read the first Top 20, you'll find a few changes since last year. For a start, we've overhauled how publishers are ranked. Last year we ordered publishers by revenue alone, but this year we've given each publisher a score depending on a number of different performance measures.

Revenue remains a factor, but measures such as the review scores of the games released, number of titles canceled, producer quality, and the amount of original IP have all been given equal importance (see the sidebar "Methodology" on page 14 for more details).

The result has a number of surprising changes. Japanese giants Capcom and Bandai, who both were featured in last year's Top 20, have dropped out of the chart and have been replaced by new entries Codemasters and Empire, two U.K. publishers. We reckon the new scoring system will prove more valuable for developers—both internal and external—by giving them a better idea of how publishers perform across the board. It also brings to light a growing trend of dissatisfaction among developers with their publishers. So, without further ado, here's this year's rundown.

### 20. NAMCO

**2003 RANKING:** 16

**YEAR FORMED:** 1955

**HEADQUARTERS:** Tokyo

**STUDIOS:** Monolith Software (Tokyo); Namco (Tokyo); Namco Hometek (San Jose, Calif.); Namco Tales Studio (Tokyo)

**NAMCO MAY BE ONE OF CONSOLE GAMING'S ELDER STATESMEN**, having been one of the first publishers to make games for the NES, but the Japanese firm's arcade roots are still very much in evidence. Its coin-op activities cover the whole arcade supply

chain from game development to running the arcades.

On the home videogame front, Namco remains a significant presence, although many of the firms once considered its peers have now eclipsed it—notably Square and Konami. The firm's annual report hints that Namco realizes this and suggests it will be doing its utmost to catch up.

Part of this effort has been reorganizing its internal studios, creating branded teams, such as Monolith Software and RPG specialist Namco Tales Studio, that are charged with producing AAA titles.

But these internal changes have not prompted the firm to abandon the use of external developers, with 36 percent of its releases originating from outside. The firm is also keen on developing new IP, as 35 percent of its titles are new despite its long history in the industry. Action games form the bulk of Namco's output (59 percent). Consoles dominate Namco's output accounting for 84 percent of its games. The remaining 16 percent is divided equally between computer and handheld titles.

### 19. EMPIRE INTERACTIVE

**2003 RANKING:** Not ranked

**YEAR FORMED:** 1989

**HEADQUARTERS:** London

**STUDIOS:** None

**THE FIRST OF THE TWO NEW ENTRIES TO THE TOP 20 IS ALSO** the only leading publisher lacking an internal development studio, sticking firmly to its publisher status. Empire also lacks the international presence possessed by many of its peers. As a result, it tends to handle publishing duties in Europe but farms out that role to other publishers when it comes to North America (even though this region accounts for 57 percent of its revenue). Empire lacks big name titles of its own but invests heavily in original products, which accounted for 64 percent of its output in 2003. This didn't help win over the critics though, and Empire's releases proved to be the least liked of all the Top 20 publishers, thanks to an average review score of 65 percent. It does, however, also own the eJay music software label and is the most PC-focused publisher profiled here.

## 18. KOEI

2003 RANKING: 18

YEAR FORMED: 1978

HEADQUARTERS: Yokohama, Japan

STUDIOS: Beijing Koei Software (Beijing); Koei (Yokohama, Japan); Koei Canada (Toronto); Tianjing Koei Software (Tianjing, China)

### OVER THE PAST YEAR KOEI HAS CONTINUED TO EXPAND ITS

reach beyond Japan through offices in North America, Europe, and mainland Asia. Despite this, it remains arguably the most niche publisher in the top 20, thanks to its range of long-running action and strategy titles based on Japanese and Chinese history. This results in about 45 percent of its games falling under the strategy genre, the highest of all publishers. Action games comprised 27 percent, while horse racing titles—G1 JOCKEY and WINNING POST—accounted for the remaining releases. Despite its seemingly narrow focus, Koei continues to perform well. It remains a console-only publisher but is making more use of external developers than in the past, with outside studios making 42 percent of its products.

## 17. MIDWAY GAMES

2003 RANKING: 20

YEAR FORMED: 1988

HEADQUARTERS: Chicago

STUDIOS: Midway Games (Chicago); Midway Home Entertainment (San Diego, Calif.); Surreal Software (Seattle)

### MIDWAY HAS BEEN ONE OF THE BENEFICIARIES OF THE NEW

method for compiling the Top 20. Last year, it managed to scrape in at number 20, and due to a \$97 million drop in revenue, it is unlikely it would still be here if we had ranked publishers exclusively by wealth. Midway is looking to improve its standing in the industry. Notably, it bought Surreal Software, developers of THE SUFFERING, earlier this year. Midway's business strategy remains focused on sports and mature titles. But when it comes to the number of titles published, Midway is the smallest publisher in the Top 20, although its commitment to multi-format releases means most of its products appeared on at least three platforms. Midway produced no PC titles during its last financial year and it is largely focused on home consoles, which accounted for more than 80 percent of its releases. Original IP made up 40 percent of its releases in the 2002/2003 financial year. Given that it employs just 310 internal developers, Midway is also a heavy user of external studios with 64.5 percent of its games having been developed by outsiders.

## 16. SQUARE ENIX

2003 RANKING: 11

YEAR FORMED: 2003

HEADQUARTERS: Tokyo

STUDIOS: Enix (Osaka, Japan); Square (Tokyo)

### ALTHOUGH SQUARE ENIX WAS FEATURED IN LAST YEAR'S TOP 20,

the year ending March 31, 2004 represented the publisher's first real year of operation following the merger of Square and Enix. As you'd expect, role-playing games, primarily FINAL FANTASY, remain the bread and butter of the firm with 91 percent of its games falling into this category. Only ALL-STAR PROFESSIONAL WRESTLING III, a wrestling title for the PlayStation 2, broke the mold. The reliance on the FINAL FANTASY series and other past hits, such as SWORD OF MANA, also resulted in the firm investing little in original IP (18 percent of releases).

## 15. KONAMI

2003 RANKING: 8

YEAR FORMED: 1969

HEADQUARTERS: Tokyo

STUDIOS: Konami Computer Entertainment Hawaii (Honolulu); Konami Computer Entertainment Japan (Tokyo); Konami Computer Entertainment Studios (Tokyo); Konami Computer Entertainment Tokyo (Tokyo); Konami Digital Entertainment (Redwood City, Calif.); Konami Software Shanghai (Shanghai)

### KONAMI IS ONE OF THE INDUSTRY'S BIG HITTERS WITH A STRONG

presence across the world. Its portfolio of hit games—METAL GEAR SOLID, DANCE DANCE REVOLUTION, and SILENT HILL—gives it strong foundations. The firm's videogame business benefits from connections with the firm's other interests, such as the popular Yu-Gi-Oh! card game series that it has now turned into an equally successful console game.

Despite its strong back catalog, a quarter of Konami's releases use original IP while another quarter is based on licensed brands such as Teenage Mutant Ninja Turtles. Unlike many of its Japanese peers, Konami releases a significant number of PC games (26 percent). It's also the biggest third party publisher for handhelds in the Top 20, dedicating 26 percent of its releases to the Game Boy Advance.

Konami's has an extensive internal development setup with its Japanese, U.S., and Chinese studios boasting a 1,000-strong workforce.

## 14. SEGA

2003 RANKING: 10

YEAR FORMED: 1952 (as Service Games)

HEADQUARTERS: Tokyo

STUDIOS: Amusement Vision (Tokyo); Cinematic Online Games (Tokyo); Hitmaker (Tokyo); Sega AM2 (Tokyo); Sega Wow (Tokyo); Smilebit (Tokyo); Sonic Team (Tokyo)

### THE VIDEOGAME INDUSTRY IS NOTHING IF NOT A TURBULENT

one, and for Sega the past year has been an unsettled one. First off, the publisher's internal studios underwent a major revamp resulting in Sega's nine studios being turned into seven. Then Sega spent several months being courted by a variety of potential buyers before Sammy Studios finally took control earlier this year. Although Sammy is a small-fry publisher of home videogames, it has a strong presence in the coin-op market, as does Sega. Quite how Sega's home game business will develop in the wake of the takeover is not yet clear.

It should be noted, however, that for this year's Top 20 we have treated Sega and Sammy as separate companies.

Sega's latest ups and downs, however, haven't affected its use of outside studios, with 26 percent of its titles being produced externally compared to 28 percent last year. More in keeping with last year was the type of game published by Sega with action, sports, and racing titles featuring prominently. Sega's interest in original IP, however, has taken a turn for the worse with just five percent of its output in the year ending March 31, 2004 coming under this category. In comparison, original IP made up more than 18 percent of its output in the preceding year. Sega has also continued to develop games for other publishers during the year.

## 13. ACCLAIM

2003 RANKING: 17

YEAR FORMED: 1987

HEADQUARTERS: Glen Cove, N.Y.

STUDIOS: Acclaim (Glen Cove, N.Y.); Acclaim Audio (Cincinnati); Acclaim Studios Austin (Austin, Texas); Acclaim Studios Cheltenham (Cheltenham, U.K.); Acclaim Studios Manchester (Manchester, U.K.)

### THOSE SURVEYED FOR THE TOP 20 HAD FEW POSITIVE

comments about the firm. One accused Acclaim of short-termism and of “sacrificing its long-term ability to effectively support its business.” Unsurprisingly, such comments were backed by a low rating in the overall survey—2.5 out of a possible 10.

Comparing this year’s performance with last year’s, it’s clear the firm increased its emphasis on racing and sports games and licensed titles too. However, at the time of the surveys, Acclaim’s revenue had fallen by more than \$160 million since 2003. At press time, the firm filed for Chapter 7 bankruptcy, closing Acclaim’s doors indefinitely.

## 12. CODEMASTERS

2003 RANKING: Not ranked

YEAR FORMED: 1986

HEADQUARTERS: Leamington Spa, U.K.

STUDIOS: Codemasters (Leamington Spa, U.K.)

### NOT ONLY IS CODEMASTERS THE HIGHEST NEW ENTRY IN THE

Top 20, it is the only privately owned company in it as well. Although it originally formed as a publisher of throwaway budget games, Codemasters has developed far beyond its humble roots. It’s now a console-focused publisher and invests most of its development budget in producing the sports and racing titles that make up 90 percent of its releases. This sports focus also helps make the British publisher the most reliant on licensed IP with 80 percent of its releases based on licenses. The firm is now gearing up for the next stage in its development with plans for flotation. Despite only having one development studio—at its U.K. headquarters—just 28 percent of its games are made externally.

But its relations with external developers are far from encouraging, with those who took part in our survey expressing nothing but criticism for the firm.

## 11. VIVENDI UNIVERSAL GAMES

2003 RANKING: 5

YEAR FORMED: 2000 (although its origins date back to the late 1970s)

HEADQUARTERS: New York

STUDIOS: Black Label Games (Los Angeles); Blizzard (Irvine, Calif.); Blizzard North (San Mateo, Calif.); Coktel (Paris); Impressions (Cambridge, Mass.); Knowledge Adventure (Los Angeles); Massive Entertainment (Malmö, Sweden); Papyrus (Watertown, Mass.); Sierra Entertainment (Bellevue, Wash.); Universal Interactive (Los Angeles)

### WITH THE SHOCKWAVES OF VIVENDI’S FINANCIAL PROBLEMS

now residing, the conglomerate’s videogame division seems on more stable footing than it was when we put together the last Top 20. Talk of VU Games being sold has amounted to nothing, and the firm has recently reorganized itself into three regional operations—Asia-Pacific, Europe, and North America—in the hope of improving its global presence.

Despite these improvements, VU Games’ revenue declined in 2003 to \$719 million from 2002’s \$832 million. The firm has also upped its use of external development studios, which now accounts for 83 percent of its games. Licensed IP remains a prominent part of VU Games’ portfolio, making up 48 percent of its 2003 releases. Its use of original IP is, at 23 percent, significantly up on 2002’s 11 percent.

Action titles are the biggest single genre for VU Games, although children’s titles at 20.5 percent of releases are also significant. While VU Games is a heavy user of external studios, those who took part in our survey said the experience was an unhappy one. Overall, Vivendi got a rating of 3.57 out of 10 from external developers while its producers received a below average score of 4. One studio reported that Vivendi’s producers “failed on nearly every promise made.”

PUBLISHER	SCORE *	REVENUE [\$ 'e' denotes estimate]	TITLES	RELEASES	EXTERNAL (%)	ORIGINAL IP (%)	LICENSED IP (%)	PRODUCER RATING	MILESTONE PAYMENT RATING
ELECTRONIC ARTS	189	2,957,000,000	36	96	36.46	3	51.35	7.6	9
MICROSOFT GAME STUDIOS	185	635,264,000 e	32	32	78.13	56	3.13	9.33	9.5
SONY COMPUTER ENTERTAINMENT	179.5	1,781,000,000 e	34	36	44.44	38	17.65	10	–
THQ	176	641,000,000	45	69	71.01	27	42.22	8.2	8.25
UBISOFT	172	624,925,280	22	35	37.14	27	13.63	7	7.5
EIDOS INTERACTIVE	150	250,414,350	13	21	57.14	38	7.69	6.33	8
ACTIVISION	145	947,656,000	27	45	68.89	26	44.44	4.57	6
TAKE-TWO INTERACTIVE	133	1,033,693,000	15	28	71.43	20	20	3	2
ATARI	125	468,900,000	44	55	61.82	20	31.82	3.8	4.25
NINTENDO	124	2,103,791,500	26	26	38.46	12	3.85	–	–
VIVENDI UNIVERSAL GAMES	119.5	719,288,700	44	78	83.33	23	47.73	4	4
CODEMASTERS	119.5	137,757,600	10	18	27.78	30	80	1.5	1.5
ACCLAIM	103.5	142,700,000	12	31	51.61	0	41.67	3.5	–
SEGA	102	585,832,210	21	30	26.67	5	28.57	–	–
KONAMI	99	888,078,320	16	23	17.39	25	25	–	–
SQUARE ENIX	98	606,642,350	11	11	0	18	0	–	–
MIDWAY GAMES	95	92,524,000	10	31	64.52	40	20	–	–
KOEI	87	265,962,756	11	12	41.67	18	9.09	–	–
EMPIRE INTERACTIVE	86	54,307,480	11	17	100	64	27.27	–	–
NAMCO	82	197,533,110	17	25	36	35	11.76	–	–

\* For details about scoring, refer to the sidebar, “Methodology,” on page 14.

## 10. NINTENDO

2003 RANKING: 3

YEAR FORMED: 1933 (although its origins date back to the 19th Century)

HEADQUARTERS: Kyoto, Japan

STUDIOS: Brownie Brown (Tokyo); Entertainment Analysis & Development (Kyoto, Japan); HAL Laboratory (Tokyo); Intelligent Systems (Kyoto, Japan); Mobile 21 (Tokyo); ND Cube (Tokyo); Nintendo Software Technology (Redmond, Wash.); Retro Studios (Austin, Texas)

### DESPITE THE GAMECUBE'S WOES, NINTENDO SHOULDN'T BE

underestimated. While Nintendo's heyday as king of the consoles may seem a long time ago, it should be remembered that in purely financial terms, Nintendo is still the second largest game publisher on the planet.

The press is also still in love with Nintendo, which boasts an average review score of 82 percent—the highest of any Top 20 publisher and the only one to score above 80 percent on average. Where Nintendo comes unstuck, however, is in its reliance on its past successes. Only 12 percent of Nintendo's games were based on original concepts, the rest relied on existing IP such as MARIO, METROID, POKÉMON, and ZELDA. The strength of Nintendo's own IP is such that titles based on licensed IP rarely feature in Nintendo's release schedules.

The firm's numerous internal studios are widely seen as some of the best in the industry, but external developers are still used. In the year ending March 31, 2004, Nintendo brought in outside studios to develop 38.5 percent of its games. Nintendo's non-Japanese internal studios have been undergoing a number of changes in the past couple of years, with Rare being sold to Microsoft and Silicon Knights becoming an independent studio again.

At present, Nintendo divides its releases equally between the GameCube and Game Boy Advance, but the imminent Nintendo DS handheld will doubtless get strong software support from the company. Nintendo publishes games across all genres, but action titles dominate, accounting for 42 percent of its releases.

## 9. ATARI

2003 RANKING: 7

YEAR FORMED: 1983

HEADQUARTERS: Lyon, France

STUDIOS: Atari (Santa Monica, Calif.); Atari Interactive (Beverly, Mass.); Eden Studios (Lyon, France); Humongous Entertainment (Bothell, Wash.); Melbourne House (Melbourne, Australia); Oddworld Inhabitants (San Luis Obispo, Calif.); Paradigm Entertainment (Carrollton, Texas); Reflections (Newcastle, U.K.); Shiny Entertainment (Newport Beach, Calif.)

### AFTER ITS SPENDING SPREE OF RECENT YEARS, WHICH SAW IT

snap up publishers and developers like they were going out of fashion, Atari is now settling into its role as a major league publisher. Hits like ENTER THE MATRIX and UNREAL TOURNAMENT 2003 have confirmed its status.

However, external developers who took part in our survey felt the publisher's internal structure was in need of a rethink. "Atari had some good producers who were sadly let down by bad higher-management," said one studio employee. Internal studio employees were also disparaging, giving Atari a rating of just 1.2 out of 10, the worst in the Top 20. There wasn't much comfort to be taken from the critics either, with Atari having the second worst average review score rating in the Top 20. No wonder CEO Bruno Bonnell is far from keen on Warner Brothers' suggestion of fines if games using its IP get poor reviews.

Despite the buy-outs, contracting external studios is still the development method of choice at Atari, with more than 60 percent of its games being handled outside the company. It also remains a big producer of computer games with almost 55 percent of its releases being for the PC market.

## 8. TAKE-TWO

2003 RANKING: 6

YEAR FORMED: 1993

HEADQUARTERS: New York

STUDIOS: Cat Daddy Games (Bellevue, Wash.); Frog City (San Francisco); PopTop Software (San Francisco); Rockstar Leeds (Leeds, U.K.); Rockstar North (Edinburgh, U.K.); Rockstar San Diego (San Diego, Calif.); Rockstar Toronto (Toronto); Rockstar Vancouver (Vancouver); Rockstar Vienna (Vienna)

INTERNAL DEVELOPER RATING	EXTERNAL DEVELOPER RATING	REVIEW SCORE AVERAGE	PERCENT OF RELEASES BY CATEGORY									
			ACTION	ADVENTURE	STRATEGY	SPORT	RACING	CHILDREN'S	OTHER	COMPUTERS	CONSOLES	HANDHELDS
7.1	9.8	77.16	31.43	2.86	17.14	34.29	8.57	5.71	0	22.92	67.71	9.38
6.6	7.1	73.23	25	9.38	25	15.63	18.75	0	6.25	31.25	68.75	0
8.4	—	74.33	25.93	11.11	0	25.93	7.41	3.7	25.93	0	100	0
8.8	7.85	68.22	35.56	8.89	4.44	8.89	24.44	13.33	4.44	30.43	44.93	24.64
5.8	4.1	79.03	63.64	18.18	9.09	0	0	4.55	4.55	25	70	5
5.6	7	75.28	46.15	0	30.77	23.08	0	0	0	28.57	71.43	0
4.72	5.4	73.56	55.56	7.41	14.81	11.11	7.41	3.7	0	35.56	60	4.44
5.6	1.6	68.92	53.33	6.67	26.67	0	6.67	6.67	0	42.86	57.14	0
1.2	3.95	66.23	40.91	13.64	11.36	18.18	6.82	9.09	0	54.55	36.36	9.09
—	—	82.24	42.31	23.08	3.85	7.69	7.69	0	15.38	0	50	50
—	3.57	69.74	45.45	9.09	6.82	2.27	9.09	20.45	6.82	32.05	52.56	15.38
—	1.4	75.28	0	0	0	50	40	0	10	11.11	88.89	0
2.45	—	66.44	16.67	0	0	58.33	16.67	0	8.33	6.45	83.87	9.68
—	—	76.96	33.33	14.29	0	28.57	19.05	0	4.76	6.67	76.67	16.67
—	—	70.96	43.75	31.25	0	6.25	0	0	18.75	26.09	47.83	26.09
—	—	76.58	0	90.91	0	9.09	0	0	0	9.09	72.73	18.18
—	—	73.03	60	0	0	20	20	0	0	0	83.87	16.13
—	—	71.81	27.27	0	45.45	0	27.27	0	0	0	100	0
—	—	65.03	27.27	0	27.27	0	36.36	0	9.09	58.82	29.41	11.76
—	—	75.22	58.82	17.65	0	11.76	11.76	0	0	8	84	8

## PROPELLED EVER FURTHER BY THE SUCCESS OF THE

GRAND THEFT AUTO series, Take-Two watched its income smash through the billion-dollar mark in year ending October 31, 2003. Electronic Arts, Nintendo, and Sony Computer Entertainment are the only other publishers who have managed to push through the billion-dollar revenue mark.

Given bloodthirsty releases like GRAND THEFT AUTO and MAX PAYNE, it's little surprise that children's titles do not feature high on the firm's product list, but given its buyout of TDK Mediactive, this is likely to change.

Most of Take-Two's games (71 percent) are produced externally. Despite what must be strong temptation to concentrate on exploiting its hit titles, 20 percent of Take-Two's releases were based on original IP. Internal and external developer opinion on Take-Two was mixed. Some complained that the publisher "often drops the ball in regards to more individual needs—communication between departments and payment of royalties" while others gave the thumbs up to the quality of its employee perks.

Action and strategy titles dominated Take-Two's mix of genres. The company's output is split roughly 60–40 in favor of consoles over PC titles. It produced no handheld titles during the year ending October 31, 2003, although its newest studio, Rockstar Leeds, may soon address that gap.

## 7. ACTIVISION

2003 RANKING: 4

YEAR FORMED: 1979

HEADQUARTERS: Santa Monica, Calif.

STUDIOS: Gray Matter (Los Angeles); Luxoflux (Santa Monica, Calif.); Neversoft (Woodland Hills, Calif.); Raven (Madison, Wisc.); Shaba Games (San Francisco); Treyarch (Santa Monica, Calif.); Z-Axis (Hayward, Calif.)

**ACTIVISION MAY INCREASINGLY BE SEEN, LIKE ELECTRONIC ARTS,** as a home to big name licenses, but the truth is the firm's commitment to original IP has improved significantly on its performance last year. In 2003's Top 20, just 14 percent of its games were original. However in the subsequent year, Activision

has almost doubled to 26 percent. That said, licenses form the bulk of Activision's releases accounting for 44 percent of its games.

Developers, both internal and external, have generally good things to say about Activision—until you mention producers, that is. "With the right producing staff, Activision would be a very good publisher to work with," summed up one external team. Internal developers were less charitable, one going so far as to brand the publisher's producers as "incompetent."

Although Activision has amassed a sizeable collection of internal game development studios, it is still a heavy user of external teams—69 percent of its games are done by outsiders. In terms of revenue, Activision is within spitting distance of hitting the magic billion-dollar turnover barrier and the firm is now hoping to break it in the 2004/2005 financial year.

## 6. EIDOS INTERACTIVE

2003 RANKING: 19

YEAR FORMED: 1990

HEADQUARTERS: London

STUDIOS: Beautiful Game Studios (London); Core Design (Derby, U.K.); Crystal Dynamics (Palo Alto, Calif.); IO Interactive (Copenhagen); Ion Storm (Austin, Texas)

### LIKE SEGA, EIDOS HAS HAD A ROUGH RIDE SINCE THE LAST TOP

20. The latest installment of its key franchise, TOMB RAIDER, was panned by the critics and prompted a decision to shift development of future Lara Croft titles from Core Design to Crystal Dynamics. On top of this, the firm's long-standing relationship with developer Sports Interactive, which made the CHAMPIONSHIP MANAGER series of soccer manager games for Eidos, came to an end. Eidos has kept the CHAMPIONSHIP MANAGER brand and set up a new studio—Beautiful Game Studios—to oversee future installments. On top of this, the buyout of Denmark's IO Interactive took a turn for the worse when HITMAN CONTRACTS underperformed. Despite its problems, Eidos has turned out to be a strong performer under our new rating system. Its strong focus on original IP (38 percent of releases), coupled with above average performance in other criteria, have pushed Eidos to the upper reaches of the Top 20.

## 5. UBISOFT

2003 RANKING: 12

YEAR FORMED: 1986

HEADQUARTERS: Paris

STUDIOS: Blue Byte (Mülheim, Germany); Red Storm (Morrisville, N.C.); Tiwak (Montpellier, France); Ubisoft Anancy (Annecy, France); Ubisoft Barcelona (Barcelona); Ubisoft Bucharest (Bucharest, Romania); Ubisoft Casablanca (Casablanca, Morocco); Ubisoft Milan (Milan, Italy); Ubisoft Montpellier (Montpellier, France); Ubisoft Montreal (Montreal); Ubisoft Paris (Paris, France); Ubisoft Shanghai (Shanghai); Wolfpack (Austin, Texas)

### GIVEN THAT VIVENDI UNIVERSAL GAMES'

French connections are pretty much limited to the Gallic roots of its parent's parent company, it is fair to think of Ubisoft as the biggest European publisher on the block. And while it doesn't lead the pack in any of the criteria we used to work out each publisher's score, it performs well across the board, and

## methodology

The *Game Developer* Top 20 is compiled using information from a wide variety of sources. A large amount of information originates from the publisher's financial reports—we have only examined publicly listed companies or private firms whose accounts are made public. Additional information has been collated from publisher press releases and from the publishers.

In addition, average review scores were based on information drawn together by *gamerankings.com*, and information was cross-checked with a number of gaming web sites. Each publisher's score was derived from the following information: revenue per

title; average review score; percentage of games published that used original IP; the number of forthcoming releases; and the number of games scrapped during development.

We also conducted confidential polls, both directly and through an online survey on our sister site *Gamasutra.com*, asking developers their opinions on the publishers they have worked with or are working with. From the polls, the overall ratings for each publisher, as given by internal developers and external developers, were added to the formula. Each publisher's overall rating for producer and marketing

quality, internal and external developers combined, was also included. The resulting scores for publishers could range from –22 to 239. Only the 30 biggest publishers, in terms of revenue, were considered for entry into the Top 20. Revenue figures were converted into dollars using historical exchange rate data from the U.S. Federal Reserve.

Every effort was made to ensure the accuracy of the information contained within this article. However, we cannot guarantee its accuracy or completeness, and we will not accept liability for any direct, indirect, or consequential loss arising from its use.



the internal and external developers we surveyed were positive about their experiences.

But for external developers, there's bad news. Ubisoft's strategy is to concentrate on its internal studios as it feels this will improve both quality and profit margins. In addition, Ubisoft's numerous studios create and share development tools, which the publisher sees as an added bonus. Certainly, its truly global network of development studios is one of the most impressive around, employing 1,564 people in nine countries across four continents. Ubisoft tends to focus on action games, which make up 64 percent of its titles. It is also a publisher that concentrates on consoles, with 70 percent of its games being for PlayStation 2, Xbox, and GameCube. Computer games account for 25 percent of Ubisoft's releases.

## 4. THQ

2003 RANKING: 13

YEAR FORMED: 1989

HEADQUARTERS: Calabasas Hills, Calif.

STUDIOS: Cranky Pants Games (Kirkland, Wash.); Heavy Iron Studios (Culver City, Calif.); Helix Games (Burlington, Mass.); Pacific Coast Power & Light (Santa Clara, Calif.); Rainbow Studios (Phoenix, Ariz.); Relic Entertainment (Vancouver); THQ Australia Studios (Brisbane, Australia); THQ Wireless (Calabasas, Calif.); Volition (Champaign, Ill.)

### FOR A PUBLISHER WITH NINE INTERNAL DEVELOPMENT STUDIOS,

including cell phone game developer THQ Wireless, it is slightly surprising to find that THQ is a big user of external studios. In 2003, more than 70 percent of its games were developed externally.

Thankfully, THQ's relationship with the external studios it uses appears to be first rate, with developers giving it an overall score of 7.9 out of 10. Internal developers also praised the firm, handing it the highest rating of all publishers—8.8 out of 10.

THQ's output is aimed pretty squarely at the mass market as opposed to the dedicated gamer. It is also a big publisher of titles aimed at children, with these releases making up 13 percent of its output.

Action and racing games, 36 and 24 percent respectively, were other key genres for the firm.

## 3. SONY COMPUTER ENTERTAINMENT

2003 RANKING: 2

YEAR FORMED: 1993

HEADQUARTERS: Tokyo

STUDIOS: 989 Studios (Foster City, Calif.); Contraile (Tokyo); Polyphony Digital (Tokyo); Naughty Dog (Santa Monica, Calif.); Sony Bend (Bend, Ore.); Studio Cambridge (Cambridge, U.K.); Studio Liverpool (Liverpool, U.K.); Studio Soho (London); Zener Works (Tokyo)

### SONY'S DOMINANCE OF THE CONSOLE MARKET HAS HELPED

its game publishing arm grow into one of the biggest in the industry. Despite its success, Sony Computer Entertainment remains a surprisingly experimental publisher with a quarter of its titles existing outside the main videogame genres, for example EYE TOY: PLAY. Original content is also big for Sony, accounting for 38 percent of releases.

Sony's internal studios are responsible for most of the publisher's games, but 44 percent of releases are still handled externally. As you'd expect, Sony only produces games for the PlayStation 2 and the original PlayStation. The forthcoming PSP handheld will no doubt receive strong support from Sony Computer Entertainment's studios. Please note that Sony Online Entertainment is treated as a separate publisher.

Staff members in Sony's internal studios who took part in our survey were positive about the company, handing it an overall rating of 8.4 out of 10. Producers at Sony were particularly popular, gaining a full 10 out of 10 rating.

## 2. MICROSOFT GAME STUDIOS

2003 RANKING: 9

YEAR FORMED: 1975

HEADQUARTERS: Redmond, Wash.

STUDIOS: Bungie (Redmond, Wash.); Ensemble (Dallas, Texas); Rare (Twycross, U.K.); Microsoft Game Studios (Redmond, Wash.); Microsoft Game Studios Japan (Tokyo)

### ALTHOUGH MICROSOFT MAY HAVE DABBLED IN VIDEOGAMES SINCE ITS

early days, particularly through the FLIGHT SIMULATOR series, it wasn't until the arrival of the Xbox console that Microsoft really became a major player in publishing. In the space of a few years, Microsoft Game Studios has gathered together a network of studios to rival all its peers and helped create some of the leading products for the Xbox, notably HALO.

Bungie, Ensemble, and Rare are all heavyweight developers with strong track records, although Microsoft's other two studios are lesser known. But Microsoft's build-up of internal talent has yet to put a stop to the firm's use of external developers. In the year ending June 30, 2003, a total of 78 percent of Microsoft's games were developed by external studios. Impressively, Microsoft has held on to its commitment to original IP, which made up 56 percent of its releases compared with the 58 percent from last year's Top 20.

What has changed from last year is the firm's focus. Last year, Microsoft's games were a 50–50 split between PC and Xbox titles, but now almost 69 percent of its games are for the Xbox. Despite increasing its focus on Xbox games, Microsoft's efforts in Japan have been a disappointment, and none of the games designed specifically for Japanese gamers, such as NUDE and SNEAKERS, have made a big impact. On the plus side, Microsoft has a sterling reputation with developers, particularly in regards to the quality of its producers and for its adherence to agreements on milestone payments.

## 1. ELECTRONIC ARTS

2003 RANKING: 1

YEAR FORMED: 1982

HEADQUARTERS: Redwood City, Calif.

STUDIOS: Criterion (Guildford, U.K.); EA Canada (Montreal and Vancouver); EALA (Los Angeles); EARS Studio (Redwood City, Calif.); EAUK (Chertsey, U.K.); Maxis (Walnut Creek, Calif.); Origin (Austin, Texas); Tiburon (Orlando, Fla.)

### FOR THE SECOND YEAR RUNNING, ELECTRONIC ARTS HAS TOPPED

the publisher league. Last year, which was based purely on revenue, was an easy victory for the Redwood City-based publishing giant, and while the new approach to compiling the Top 20 helped make for a tougher contest, Electronic Arts is yet again in pole position.

Electronic Arts performs consistently well across all the Top 20 criteria. Its revenue is the largest of all publishers, the external development studios that took part in our survey regard it as the best around, and its marketing prowess is viewed second only to that of Sony Computer Entertainment. Internal developers at Electronic Arts' numerous studios are also a happy lot, one developer summing up the company as an "absolutely professional company across the board."

Most of Electronic Arts' development work (63.5 percent) is handled internally, something that the recent acquisition of Criterion is only likely to further increase. But, on the downside, if you're keen on developing new IP, Electronic Arts' success won't be good news, as a mere 3 percent of its output in the year ending March 31, 2004 was original. But given that its nearest revenue rival, Nintendo, earned almost a billion dollars less in the same financial year, there's little chance it will feel tempted to abandon its license-heavy course. ❖

# THE NEW STUDIO MODEL

## A SEARCH FOR STUDIOTOPIA

» **IT DOESN'T BOTHER ME TOO MUCH WHEN I RUN ACROSS THE** standard "decline of the industry" article from the gaming press. Every gaming journalist seems to have his or her own bone to pick. And it certainly makes for a good headline.

But it gets scary when the mainstream press starts to pick up on the idea. Reuters says there's a "crisis of creativity." CNN says, "it's easy to believe innovation is dying." The *Philadelphia Inquirer* says that seeing the same brand names, like Mario, Lara, and Sonic, over and over again is "the gaming equivalent of watching non-talents such as Anna Nicole Smith and Paris Hilton on TV."

We're at a creative crossroads here. It's no breakthrough statement to say that the game industry has been remarkable lately for being unremarkable: derivative games, derivative sequels, and derivative licensed properties. But maybe the real lack of creativity is in our approach to the fundamental management structure.

Publishers will tell you that the public wants games based on existing intellectual property. On the other hand, you can argue that the higher sales figures for licensed properties are the result of a limited selection of good, original games and the publishers' lack of willingness to get behind anything, marketing-wise, that isn't already an existing brand.

At the same time, the Entertainment Software Association recently released a survey showing that about one-third of gamers would like to see fewer licensed titles, especially as technology expands the boundaries of what's possible.

Regardless, the publishers aren't flashing the green lights very often for new, original titles, while those that are produced wither on the vine, unadvertised and unappreciated.

Meanwhile, independent developers are fighting a two-front war: maintain creative integrity and pay the rent. Development houses are being gobbled up by larger publishers at an alarming rate, and those that fail to be assimilated have a tough time making ends meet. Sure, there are quite a few successful independent developers right now. But how long will they stay in control of their destinies before business pressures and a lucrative offer lure them into a publisher's system? There always will be notable exceptions, of course, but I already miss the days when companies such as Rare, Westwood, Looking Glass, and Bullfrog made names for themselves by pushing the creative envelope.

Developers and publishers need to reach a compromise that balances the security and pre-existing audiences that licensed IPs bring with the developers' itch to get their original game concepts on store shelves.

What studio system offers American McGee the best chance to create his next videogame? Is there something better for Peter Jackson than a long-term relationship with

Electronic Arts? Would a new perspective on game development offer J.K. Rowling the ability to direct the next Harry Potter game exactly the way she wants it, with just the right level of involvement?

Looking at these examples, it's apparent that the industry needs a hybrid production model, one that alleviates the business and administrative headaches of the creative visionaries, but doesn't turn over creative control of original IP to publishers.

This kind of model—a hybrid of current game development structure and the production-end structure common to Hollywood—is well within our grasp.

### ORIGINAL IP

We say we want to return to focusing on creating original IP. What are we really talking about?

- Publishers desire less financial risk.
- Creative visionaries desire the opportunity to make the games they've always wanted to make, with full creative control.
- Developers (programmers, artists, animators, and designers) desire creative, comfortable environments that place the team members first.

These ideas are possible if we rethink the way publishers organize internal development studios. Right now, several publishers are moving toward a model where off-site development houses are consolidated into a few, central locations. EA has this down to a science and other publishers are following. The centralized model reduces overhead, encourages sharing resources, and streamlines the entire development process.

While that makes plenty of business sense for the publisher, it's wrongheaded from a creative perspective. Centralization more often than not stifles creativity, or it merely appears to, which is almost as bad because it can scare away talented individuals.

So, how do you marry the low overhead of centralized development with the creative, fresh ideas that will earn the most money?

In the New Studio Model, a publisher establishes a new internal studio—art, programming, animation, audio, general administration, legal, and quality assurance—into a Development Core that can handle four to six projects in a support role. The mission of this studio is to apply its development capabilities to original IP, acting in support roles for the lead programmers and art directors on the projects.

This Core focuses solely on original IP. Projects based on existing brands are directed to traditional publisher studios, while the publisher's flagship studio continues to provide common resources, such as sales, marketing, and human resources support. These don't need to be on site with the Core.

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Ideally, the Core has a strong management infrastructure with common goals that allow it to operate effectively. While that may sound awfully corporate for a developer, it's not so different than a current developer/publisher relationship. The key difference is that this corporate structure has clearly defined business goals that leave the creative goals in the hands of developers.

The Core's role encompasses all the needs of videogame development, short of the top-level talent and creativity. By itself, the Core can handle the nuts-and-bolts end of the videogame equation. The Core, then, is organized like a fully-equipped Hollywood production studio. Everything you need to make a movie is under one roof.

## YOU BRING THE DESIGN, WE'LL DO THE HEAVY LIFTING

Now that you've got the nuts and bolts in place, it's time to attract the top-level talent that will provide the spark of creative life.

Let's envision a model where a publisher invites top-level talent and offers them the opportunity to control their creative destiny on a single-contract basis, with the Core providing the heavy lifting capabilities.

Imagine the possibilities for a publisher who sets up these kinds of relationships, where the likes of Peter Jackson (director, *Lord of the Rings* trilogy), Warren Spector (designer, *DEUS EX*), and Patrice Desilets (creative director, *PRINCE OF PERSIA: THE SANDS OF TIME*) are all working in-house solely to develop the most creative games possible. The common thread between all these visionaries would be the desire to embark on the creative endeavor they've always dreamed about without the headache of managing a developer.

The Core makes that possible with its modular development scheme and support capabilities. Similar to how a Hollywood production studio operates with top-level writers and directors, the creative gaming leads—for example, the lead programmer or lead programming team, the art director, or the lead designer—partner with the publisher and direct the work of the Core to support their game designs.

As we'll see, a three-part relationship (see "What They Do") crafted along these lines stabilizes the often tricky relationships between publishers and the creative talent that drives new properties. Moreover, it provides a stable, creative environment for the team members who make up the Core.

## A WIN FOR THE PUBLISHER

The publisher is fronting the cost for the Core, a centralized development studio that can service four to six development teams. Surely, this is a major financial risk. How does the New Studio Model work for the publisher?

**ATTRACTING KEY, CREATIVE TALENT.** By offering the opportunity to work on its own game, a studio stands the chance of working with some of the most creative individuals in the industry. Done right, the Core concept allows a publisher to contact key creative talent and essentially toss them the keys to a top-notch development studio. It's a chance to finally make the game they've always wanted, but without the risk of striking out on their own and creating a brand new studio from the ground up.

To a visionary—perhaps one who has struggled in the past with projects assigned to her or him by a publisher and a marketing department with their own agendas—this is an enticing prospect.

The publisher will invite this key design visionary to set up an internal development team within the Core to craft the project of the visionary's choice. Using the raw materials of the Core—think of Hollywood's camera, costume and carpenters—visionaries could design their games without interference, set up a development schedule, and control their own destinies in much the same way they might have done had they formed a studio.

**SHARED RESOURCES EQUAL LOWER COSTS.** The structure of the Core is similar to the current, well-established model executed by EA. By combining the best development teams into a central studio model with shared resources, the publisher enjoys significant cost savings.

Manpower is a publisher's largest expense. But under the New Studio Model, the publisher is contracting talent, as opposed to hiring outright.

Under the model, the costs of the Core, along with the benefits, equipment, and other non-development costs, are shared with the visionary via contractual deals in which those costs are covered through a shared royalty structure. Again, we come back to a Hollywood example where the visionary shares the costs to get the game done in exchange for the greater potential on backend sales. The lower overall cost of the Core adds to this value, too: The shared resources and lower overhead result in even greater profit potential.

What we have, then, is a model where the publisher minimizes financial risk, while the visionary is encouraged to take an even greater ownership stake in the product being delivered.

Not every game that emerges from the Core would be a blockbuster success, of course. But I'm betting that the combination of cutting-edge talent, license-free original IP, and low overhead would provide a far greater chance for profitability.

### LET GO OF THE CREATIVE, KEEP CONTROL OF THE BUSINESS.

In the New Studio Model, the publisher relinquishes creative control to the visionary. On the other hand, the publisher retains business control of the Core. Is this a negative or a positive aspect? In the long term, it's a tremendous positive. Let someone like Shigeru Miyamoto handle the Miyamoto vision. The project's overall status and funding would still be balanced by a publisher partner with business sensibilities. With a centralized Core operating with robust, shared resources and visionaries who are the cream of the crop, the "it's done when it's done" mentality would be an exception and not the rule.

Besides, publishers need to stick to what they know best: marketing, sales, tech support, IT, and human relations. Let the visionaries handle what they know best: the ideas that spell the difference between a game you rent and a game you pre-order and tell all your friends about.

## A WIN FOR THE VISIONARY

**MAKE THE GAME YOU'VE ALWAYS WANTED TO MAKE.** What's in it for the visionaries? It's simple, really. The New Studio Model allows visionaries to try their hands at making games without the risk of personally funding a studio.

Take the typical creative lead of a top-selling game. This designer/producer/artist/programmer might have a dynamite game concept, possibly several, sitting on his or her home computer. But the developer might not have the desire or the financial wherewithal to make a gamble on a new company. However, he or she might be willing to take control of a bigger and better project, given a more realistic opportunity. The New Studio Model, with a sense of cost certainty and allowable creativity, might be the best bet.

For industry veterans who choose to participate in the New Studio Model, the ability to work on a project of their choice holds real value. Very few of us get to work on our "dream game," but this model would give more individuals the option to work on the game of their choice.

While the New Studio Model would certainly attract the unknown stars of our industry, what would happen to people like Louis Castle and Jason Rubin who already have the means to start their own company (or, in many cases, have already been there and done that)?

For these veterans, the New Studio Model contracts could be double-tiered, offering fewer benefits for rising stars looking for

## WHAT THEY NEED

### PUBLISHERS NEED

- Balanced game catalogs between original IP and license properties
- Top-notch development talent
- Reduced financial risks and cost certainty

### VISIONARIES NEED

- Opportunities to develop original IP while maintaining creative integrity
- To retain rights to that original IP

### DEVELOPERS NEED

- More creative opportunities
- Greater share of financial rewards
- Greater personal exposure and recognition

## WHAT THEY DO

### PUBLISHERS

- Operate the day-to-day business functions of the Core
- Manage common publisher resources such as legal and quality assurance
- Handle business decisions

### VISIONARIES

- Control creative development
- Direct the development team of the Core

### DEVELOPERS

- Create the game (art, animation, level design, programming, scripting, audio)

a break and greater benefits for those visionaries with a proven track record. Additionally, the New Studio Model would offer seasoned veterans the opportunity to take full creative control of a project while removing the headache of managing the day-to-day operation of an independent company. With the cooperation of the publisher and the skills of the Core, these veterans could focus 100 percent on making great games.

**HOLLYWOOD TALENT PLAYERS.** Through my experience working on previous Shiny titles, I've met more than a handful of Hollywood visionaries who are itching to get involved in games. The New Studio Model would allow these Hollywood names to get a game project up and running, while maintaining full creative control. At the upper levels of Hollywood, these visionaries could rely on the increased publisher support to allow them to direct the project as they see fit—as much or as little as possible, depending on their interest or the demands of their Hollywood projects.

**KEEP YOUR IP TO YOURSELF.** Imagine the difference between Will Wright creating *THE SIMS* for EA, and Will Wright owning *THE SIMS* himself.

This is perhaps the most important aspect of this exercise. Imagine a model that rewards the individuals who dream up new IPs by letting them retain the rights to their IP, rather than defaulting those rights to the publisher.

"Why would any publisher let the visionaries own the rights to their own brilliant ideas?" you ask. After all, the publisher coughed up the money. It's never been particularly fair, but hey, neither is life. Publishers won't hand over their revenue streams without something significant in return. The trick here is to make the deal a winning situation for both parties.

I propose that, under the New Studio Model, the visionaries own their IPs and earn royalties based on it. In turn, the publisher would have rights to publish games based on that IP until it passes on a first-look option to produce a game for a specific period of time. Again, this is akin to how Hollywood operates. Producers and studios often purchase the rights to produce films based on original IP (books, for example) for a fixed period of time. The writer retains the rights to the original IP. Kubrick and Nicholson be damned; Stephen King will always ultimately own *The Shining*.

Done with games, this model encourages greater creativity and provides the most beneficial environment for both the visionaries who actually dream up new properties, and the publishers that want to make profitable games. The visionary owns the IP outright, but the publisher basically owns the IP, too—or, at least, the part of the IP that actually makes money.

As it stands today, our industry is filled with creative ideas that developers simply aren't willing to talk about for fear of losing control of them to publishers. With IP rights defaulting to the visionary, we'll see more cutting-edge and creative titles to expand our gaming audience.

## A WIN FOR THE DEVELOPERS

What about the grunts in the development team, the guys and gals doing the real work? After all, the developers—people who actually make the games—must benefit as well.

**A BIGGER PIECE OF THE PIE.** In our model, the developers would be either contracted by the visionary directly or hired by the Core, depending on the visionary's interest level in the process. Contracted developers would operate under single-game contracts, organized along the same lines as every Hollywood studio. It's a lowered vision for job security, sure, but the positive benefit to offset that would be contracts that stipulate significantly greater royalty payments.

While it's fairly common for development teams of reasonably successful games to reap gross royalty payments of \$1 million or more, the publisher of the title often earns an enormous percent of the backend profit. For the New Studio Model, I

suggest that in order to attract the top talent, the developers receive an increased share of the profit in their royalty pool. This added incentive would encourage a greater sense of ownership in the final product, resulting in higher quality overall.

**WORK DIRECTLY WITH VISIONARIES.** Developers would be working with some of the premier creative minds in the business. The opportunity to work with Hollywood directors and game industry brand names would be enough to lure some of the top talent currently toiling for obscure development teams.

As mentioned before, developers working under the New Studio Model would be single-game contractors, just like Hollywood talent. An added benefit to this arrangement is the opportunity for developers to attach themselves to successful brands and network with the visionaries creating those brands.

In the end, the developers can finally take credit where credit is due for their work on a project. Very often, their work is hidden from view by publishers fearful of recruiters and competitive studios. But working within the New Studio Model, publishers are best served by actually promoting the talent working under their aegis, as better talent overall serves to attract the visionaries who drive the commerce engines.

**CREATURE COMFORTS.** Over the years, I've been fortunate to have jobs at companies willing to support their teams with the tools they need to get the job done. But from visiting other developers, I've noticed that not everyone gets this support. Why are publishers saddling developers with rickety gear?

With centralized purchasing power, teams working in the Core could be equipped with cutting-edge equipment and software tools. Decisions about the office would be made with the team members in mind. Comfortable chairs and large computer monitors would be standard. As equipment would be purchased or leased at the outset of each project, computers would have plenty of horsepower for the entire development cycle. Creature comforts such as ample desk space, television hook-ups and HDTV monitors would be standard. Every effort would be made to equip team members with everything they need to make a AAA game.

Since the visionary is only a part of the talent required to finish a game, the publisher would make all efforts to create an attractive development environment. Studios would be located in reasonably priced places to live, near Los Angeles, San Francisco, and New York but on the outskirts where publisher would be able to pass cost savings onto developer salaries. Offices would revolve around team member needs, with Aeron chairs, dual 21-inch monitors, and fast computers. You get the talent you pay for.

## A SHOCK TO THE SYSTEM?

New ideas and new technologies always disrupt the marketplace. IBM thought the hardware was important and left the software to Gates. Polaroid scoffed at digital cameras. Dot-coms created both the fantastically wealthy and the fantastically silly.

Can we learn from other industries, transform our practices, and create a host of new, great games? Can we do it without making someone the victim?

I think we have to.

The media says creativity is dying in the gaming industry. They're talking about game design ideas. But perhaps the real lack of creativity is in our approach to the fundamental management structure.

We all need to take more ownership in our industry and use our collective brainpower to solve the problems that won't solve themselves. Maybe part of the solution is a revised model for studio production, as I've suggested. There are lots of ideas out there, in *Game Developer* magazine and on personal blogs, for example. I encourage everyone to take a stab at some creative solutions and submit them to a public forum. ❖

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Gene Mauro of startup publisher Myelin and  
Chris Beatrice of independent developer Tilted Mill  
come clean on how they approached their publishing deal.

## THE ART OF THE GAME DEAL

### JAMIL MOLEDINA

is the editor-in-chief of  
Game Developer. He can  
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#### WHILE NO DEAL IS TYPICAL, THERE ARE CERTAIN FAMILIAR

threads that stand out in the game development mating ritual between publisher and developer. Is there a strong game here? What are the revenue projections? How risky is the innovation? When is the right time to sign? Can we make the game we want to make? Are we going to get paid what we deserve?

These generic questions become concrete realities frequently enough, and the deal between Myelin Media and Tilted Mill to develop and publish *IMMORTAL CITIES: CHILDREN OF THE NILE* is no exception. While the name Myelin may seem new to you, its driving force, Gene Mauro, has been building interactive entertainment deals for years with Dotted Line Entertainment and more recently the infamous Capital Entertainment Group (CEG). His first deal as CEO of Myelin was to publish Tilted Mill's latest game. On the other side, Chris Beatrice, Tilted Mill's president and director of development, also has a rich development history, having led Sierra's Impressions studio. In that capacity, his team developed and shipped the *LORDS OF THE REALM* and the *LORDS OF MAGIC* series, as well as the city-building archetype *PHARDAH*.

So what went through their minds? What criteria determined their decisions? Perhaps most importantly, how did this deal come about? Some of it was the old, unavoidable wink-wink, nudge-nudge. Yet a substantial element of making a deal comes down to balancing widely divergent goals. Read on to see how you too can doublethink your way into a publishing contract.

But before we get to that, first things first.

#### THE PUBLISHER

**Jamil Moledina:** Gene, why wasn't CEG able to raise enough money?

**Gene Mauro:** There was a lot of buzz at the time; a lot of interest around and in the industry, obviously a \$30 billion industry, brought a lot of interest from professional fund managers and venture capitalists alike. It was not unlike the way they approach a lot of their investments, meaning concentrate your early stage investment on a very specific focus, and then only on the strength of that focus proving true do you go to the next step. That kind of methodology really was familiar to them. What

was unfamiliar to venture capitalists—and where ultimately the hurdle was for us to close the \$30 million that we needed to sufficiently capitalize the company—was the creative production risk. At the end of the day, the venture capital community was really interested in the size of the market, the potential of the market but as it relates to game production, not unlike film production, or television production, or other creative production businesses in entertainment. They came to the conclusion that, jeez, this is going to be, at the end of the day, based largely on a creative process that is not necessarily predictable. And that was their big concern. There really isn't in console or game production a proprietary game component that you could run your numbers against, and that was the thing that really got in the way.

**JM:** So how have you overcome this hurdle with Myelin?

**GM:** Well, the CFO of CEG, Grant Winton, and I decided that there's still a gap between independent developers and publishers, and we wondered if maybe we can't apply what we learned at CEG into a model that might be more palatable for investors. And that was the genesis of Myelin—to change the investment target so that it was a bit later. Not quite as late as most traditional publishers like to see their product in terms of prototypes, but where a clear, quantifiable vision meets execution, is really what we were looking for. That was our first step.

We were then introduced to Carl Icahn, who is a prominent member of the *Forbes* 400. He had been looking at the videogame space on an opportunistic standpoint, and he has some portfolio companies that would benefit from some game content, and that's what initially brought him into this space. So with some of the principles of CEG, we began to form Myelin and actually made some other substantial changes that also mitigate risk. Certainly, changing the stage of investment is one way of mitigating risk;





Chris Beatrice, president and director of development at Tilted Mill

you can see more demonstrably what kind of gameplay you have if the mechanic is fun and interesting and can be differentiated in the market, therefore salable, but another way is to make a substantial leap from CEG, meaning to really behave much more like a publisher in bringing your products to market yourself.

**JM:** But creative development is still a risky business. In your model, isn't the risk just being passed to the independent developer?

**GM:** In a sense. The reality is that there is no other alternative financial channel available to independent developers today. We very carefully and very deliberately established greenlight criteria that are designed not to push the independent developer to the point where he's not able to achieve a level of demonstrable gameplay, which I think often is the case with traditional publishers. What we're looking for is a team of developers that have a very strong vision, and some level of execution to support that vision. Now if that's 15 percent or 50 percent through, we're open, and we're flexible. The most important thing is looking back behind where you are at that stage, so that a lot of titles we've looked at might have been in production for two years, but frankly it's not working, because it's not the right game—the game's not fun, or it's derivative, it's not unique, or whatever. Whereas there are other products that might be in production for as short a period of time as six months, that clearly has a special X-factor—something unique is happening there, something fun is working there. Now you want to get behind that project and provide the resources it needs in order to get to market successfully.

**JM:** So how does your first game, Tilted Mill's *IMMORTAL CITIES: CHILDREN OF THE NILE*, satisfy your X-factor test?

**GM:** When we happened upon Tilted Mill and their desire for a publishing deal for *CHILDREN OF THE NILE*, it was pretty evident to us that they had really evolved the category even further than they ever had before. I think it's based largely on a specific vision and focus that Chris Beatrice, the president of Tilted Mill and the lead designer, had. He very clearly identified an opportunity in the market. He saw that not just based on his experiences in designing and developing for the category, but based on real-time market conditions. There was a real absence, a real void in this category, and he saw his market opportunity and very deliberately went out and designed and developed a game to address that need in the market. We were fortunate to come upon Chris at a point where he

had advanced that to at least a 30 percent stage, and we very quickly moved toward wanting to do a deal with Tilted Mill.

**JM:** What does a developer like Tilted Mill get from you?

**GM:** We want to have a very close relationship with the developer. We bring them into the marketing process. Frankly, at the end of the day, we treat every one of our titles with a tremendous amount of focus and detail that I think a lot of large publishers simply can't. They've gotten so large, and the focus on dollars being spent, be it from promotion or marketing or otherwise, can often become a tricky and difficult thing to manage. So I think Chris is probably at the end of the day most excited by the amount of attention that we bring to his product.

**JM:** Considering you're a publisher with a single investor, how do you, Icahn, and Myelin's management team make publishing decisions?

**GM:** There are two other principles in the company besides Grant and myself. There's Kenneth Woo, and Brett Icahn, Mr. Icahn's son. The way we greenlight products is not too dissimilar from what most publishers do. We have weekly meetings and we gather up the various opportunities that we're evaluating, that we're looking at, and we weigh in with opinions and perspective on what we think is interesting and why, and not interesting and why not, other companies, and we ultimately have a vote on the one or two products that we think warrant further evaluation or further assessment, or due diligence. We have a very flat and lean management team, so we look to move through that very process quickly and really don't delay decisions to developers. But once we get to the point where we're serious about wanting to publish a game and make that investment, we'll work with Mr. Icahn as you would with any investment committee, on laying out what it is that we see as the opportunity in the market, what the financial models look like, what the projections and marketing analysis looks like, and from there we move, forward or not.

**JM:** What games are you playing now?

**GM:** I'm playing *RED DEAD REVOLVER* and I'm a bit of a football sports fanatic on PC, so I've always enjoyed *MADDEN*.

## THE DEVELOPER

**Jamil Moledina:** When you started to develop *CHILDREN OF THE NILE*, what was your pitching strategy for publishers?

**Chris Beatrice:** I've been making games for about 10 years but actually running a development studio for four or five of that, as a head of a studio at Sierra, working with one of my partners at Tilted Mill who was the financial guy. So when we spun off,



# THE ART OF THE GAME DEAL

we were passionate about a lot of different games, but also really passionate about running a business that's going to be around in a few years. Part of our pitching strategy was not to spin off and do something that had never been done before, but to do something that we knew we could do well; and so when we went to publishers they would also know that we had done it before and we could do it well. We wanted to pick or create a genre with a lot of potential but was untapped. And again, we were forced in that this was a genre that Impressions had basically invented, and although some other Impressions spin-offs had done some things like this, it was pretty much playing field. From those two perspectives, you could almost say our pitching strategy was kind of conservative. We built



this kind of franchise in the past, now no one's doing it. We took most of the team from Impressions, so no one's doing it. This was our first product and what's most important is that it's a great product, and that the company gets on its feet. That was our pitching strategy originally, and that morphed over the years. When we first started out, just to get the foot in the door, it was a lot of, "We're the guys who ran Impressions, I'm the lead designer of PHARAOH, now we're making an Egyptian city-building game." As the game has finally taken root, now we're definitely not emphasizing the PHARAOH connection because now we're fighting the other battle, which is, "How is it different?" [being asked by] the audience. So a pitching strategy for publishers is different from a pitching strategy for the audience.

**JM:** How far along were you before Myelin came along, and what was your gameplan leading up to the contact?

**CB:** Almost exactly two-thirds of the way along. We started in October 2001 and met up with Myelin in December of 2003. It's been generally accepted among many of my peers that the more you can do yourself before you approach a publisher, the better deal you're going to get and the better off you're going to be. Not just in terms of the finances, but because for a lot of people, if you go to them with an idea or something that's half done, as much as they want to say they have foresight, they don't. They see something that's not quite working just right, and they get turned off to it. I should say, though, that that's a bit of the old school mentality because I've also found the exact opposite to be true, which is you go very far along and you have a great looking product, but when you go to a certain publisher, they say, "You know what, we would have really liked to do a game kind of like this, but we really wish it was about developing an ice cream stand instead of a hot dog stand." In that case, it would have been better if you had been working with the developer from the beginning, which is much more like our past experience being an internal development studio. We would start ideas very early on just bouncing around, "What do you want us to do?" kind of a thing. By the time you got to full development, of course the publisher was completely on board. Here, it's kind of hit or miss. It's like this particular publisher just doesn't happen to be interested in this kind of thing right now. There's nothing wrong with what you're doing; they're just not interested. If I had to do it over again, I think I would do both approaches. Do a lot of proposing at the idea stage, just to see if you can catch a publisher who's really excited about that, before you've invested a lot of money into it. We had invested a lot of money by the time we started looking for a publisher.

**JM:** How did you connect with Myelin?

**CB:** It's not what you know, it's who you know. You know I honestly don't know how this industry survives! [Laughter.] I've known Gene Mauro for seven years. At his first company, he was basically a talent scout, and he recruited some key members of Impressions. I left Impressions about the same time he set out to start Capital Entertainment, and he was my first contact when I started Tilted Mill. I was really enthusiastic about working with Capital. So they kind of paralleled our development all along. When he closed Capital, I actually e-mailed him, and said "What are you doing now? 'Cause here's what we're doing." And he said, "Funny you should ask!" [Laughter.] And there wasn't any kind of formal introduction, we just happened to know each other.

**JM:** Since you know Gene so well, how would you characterize your working relationship with the entire Myelin team?

**CB:** I knew you were going to ask that! Can you turn off the tape recorder? [Laughter.] No, no that's okay. This business is just incredibly tough, and in all my 12 years now, I'm used to going home every Friday having gotten into a big argument with someone at one of the various publishers we're working with. It's a very high-pressure thing. As far as our day-to-day working relationship, all that pressure and that kind of stress is still there, it's no different. The environment's the same, there's no magic that makes all that stuff go away. It's a dynamic industry, you've got to do a lot in a very short amount of time,

CONTINUED ON PG 63





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# POSTMORTEM POSTMORTEM

## THE MOBILE MULTIPLAYER GAMEPLAY OF BLUE RIDGE'S MOMENTUM



### » MOMENTUM, RELEASED JULY 2004, IS THE FIRST MOBILE TITLE DEVELOPED BY

Blue Ridge Games. We set out to create a mobile game that would combine a vintage, arcade game style with the advantages of online communication. At the same time, we also wanted the game to address the latency problem commonly found on today's mobile phone networks. MOMENTUM's initial launch got thumbs up from critics, but because of its limited distribution so far, the consumers may not have had a chance to let us know if they agree with the critics. At launch, the game was only available through Verizon Wireless on the LG VX 4400, 4500, and 6000, and Audiovox CDM-8900 handsets (check our web site [www.blueridgegames.com](http://www.blueridgegames.com) for a current list).



In MOMENTUM, six players interact and compete against one another by leading their characters through a shared maze to collect eight coins. The collection of the eighth coin opens a player's door. If he or she manages to avoid other players, running the gauntlet on the way to his or her door, that player wins. In collisions, players with the same number of coins bounce off each other, while players with 1-7 coins crunch those with fewer coins (crunched players lose a coin and are teleported to a different part of the maze). The game adds to the excitement with a variety of power ups, and pre- and post-game lobbies with integrated chat and player statistics.

WRITTEN BY:

**ALLEN EICHLER** is the founder and president of Blue Ridge Games, Inc., and a 14-year industry veteran. He led the production and design efforts on Momentum. E-mail him at [aeichler@gdmag.com](mailto:aeichler@gdmag.com)

## WHAT WENT RIGHT

### 1 DESIRE, AMBITION, AND FORTITUDE TO CREATE SOMETHING

**NEW.** We wanted to make an innovative AAA title and retain ownership of the IP without having to raise millions in alternate financing. We chose the mobile platform partly because the platform limitations cap the amount of money that can be reasonably spent on production values. More importantly, we noticed the rapid uptake of game-capable handsets, and a casual gamer audience on a platform where consumers are used to paying for services. We also noticed that most mobile games, despite being played on communication devices, are solitary experiences.

We took our inspiration from the classic arcade games where a simple, engaging experience occurs in just a few minutes of play. While a phone doesn't have the controls of an arcade unit, it does have something no *SPACE INVADERS* cabinet ever did—a modem. And that opens up a world of opportunity for a creative developer. So we pulled together a team of seasoned client-server game developers and set out to bootstrap our way to a unique multiplayer mobile game.

Most mobile networks experience significantly higher network latencies than broadband or dial-up networks. With ping times frequently in the 0.5 to 1.5 seconds range, it was understandable that we could not find any multiplayer mobile games that weren't turn-based, or offered parallel play where there was no real-time interaction.

We had some ideas on how to deal with the network latency, but we couldn't be 100 percent sure how long it would take to implement the solution. In fact, several times during the development cycle, we doubted whether we could ever get the technology to work. If we did get it to work, we weren't sure it would be fun. This is where most big, risk-averse publishers would have pulled the plug. Being a small, independent studio, it seemed like a risk we could take. We knew if it worked, we would have a distinct product. After all, the big, conservative publishers would not take such risks, so they would not have a product of similar capacity.

**2 SECURED TOP TALENT.** I believe the game industry is a talent-based business. When trying to do something that has never been accomplished before, you have a much better chance of succeeding if you work with A+ people (but a good chance of never shipping the game with C people). I knew some of the A+ talent I wanted on my team, but they had other commitments. Just when I didn't know where I was going to turn, some talented people became available because a game they were working on ceased production. This turned out to be a good thing for *MOMENTUM*. We were lucky. I couldn't have picked a better team.

The core engineering team members had earned experiences developing MMOG titles such as *AIR WARRIOR*, *MULTIPLAYER BATTLETECH*, *ISLAND OF KESMAI*, *STELLAR EMPEROR*, and *MEGA WARS*. They brought their learning and skills to *MOMENTUM*. I would not have wanted to work with someone creating a client-server architecture, designing packet protocols, or tackling scalability issues for the first time. The project faced some tough new engineering problems and the team quickly diagnosed and resolved those issues. What's more, experience had taught them to address support costs in the initial design phase.

To enable the gameplay mechanics, we needed to keep characters to 16x16 pixels. The initial design acknowledged the characters might be nothing more than colored circles due to size constraints. Fortunately, I was able to secure an artist with 20 years of experience creating art for games on C64, Atari, NES, Game Boy, and other 2D platforms. He was able to make 18 unique, distinguishable characters despite the limited space.

### 3 SUCCESS WITH CORE DESIGN MECHANICS TO DEAL WITH NETWORK LATENCY.

We developed a look-ahead mechanism to accommodate network latency. By making players plan ahead, we were able to telegraph moves to the server and allow clients to accurately predict several seconds into the future. Without this, the whole project would have been dead on arrival. We ran into some issues testing on initial prototypes in keeping the shared state synchronized, but we pushed forward despite the initial mixed results. Eventually, we got it working. And, thankfully, when we finally played our first real-time multiplayer mobile game, we found the experience really fun.

**4 FOCUS ON THE USER.** We decided at the onset to try to attract more casual gamers who didn't want to spend 20 hours a week on mobile MMOG, so we let that notion drive many of our decisions. We worked hard to keep the game simple. We tried to keep the key-press rate to a slow pace. We wanted to keep game sessions short—not something you have to schedule for, but bite-sized enjoyment you can undertake when you have only a few minutes to kill. If a game starts running long, for example, the server sends more coins into the maze and moves exit doors closer to prospective winning players.

Despite short sessions, we wanted to give some sense of persistence, so we created a point and level system based on victories and opponent levels, along with a monthly tier system to match similar-level players. We wanted to let novice players get lucky and win, but wanted to give advanced users the ability to gain an advantage through tools such as power ups and radar. This focus drove much of the design and helped us pare down features to get to a ship date.

**5 LAUNCH WAS TROUBLE-FREE.** The launch was pleasantly uneventful from a technology perspective despite some moving pieces. Getting the production servers ready was more difficult than expected because we had insufficient general liability insurance and needed to secure a policy at the last minute before the co-location facility would allow our network engineer in the building. We also had some anxiety when the launch date from Verizon jumped around a bit, but were happy to finally see our product listed on their well-trafficked download screens.

## WHAT WENT WRONG

**1 UNFAMILIAR WITH MOBILE/DEVICE IDIOSYNCRASIES.** While the team had tons of experience developing PC games and some console/handheld work, none of us had significant experience developing for cell phones. During the course of development, we learned about the devices' odd behaviors.

**TCP/IP.** We developed a robust prototype (client, server, and core gameplay) on some Java phones early in the process. Though we had hoped that an http-connectivity scheme would work for phones that did not support sockets, we expected to use TCP/IP for the most part. It didn't give us the performance we needed. In fact, some of the phones we used in testing didn't want

## GAME DATA



**PUBLISHER:**  
Blue Ridge Games

**NUMBER OF FULL-TIME DEVELOPERS:**  
1

**NUMBER OF CONTRACTORS:**  
9

**LENGTH OF DEVELOPMENT:**  
12 months

**RELEASE DATE:**  
July 2004

**PLATFORMS:**  
BREW, J2ME

**SERVER:**  
Linux/C++

to do anything (for instance, they wouldn't redraw graphic animations or play sounds) while waiting for the TCP packet acknowledgment. To overcome this, we shifted to UDP. UDP provided the benefits of lower packet-overhead and more control, but we still wanted some features of TCP/IP, such as automatic retries, packet ordering, and so on. Switching to UDP meant we had to re-create much of the functionality found in TCP/IP.

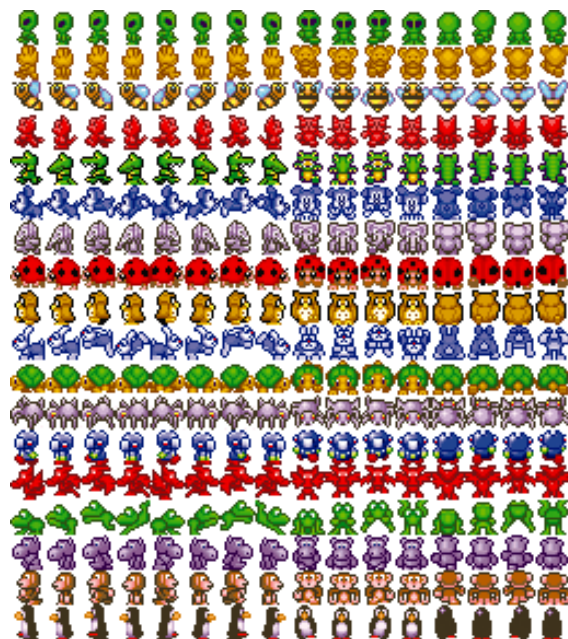
**IP address.** Initially, we noted the player's IP address at login time and used it as the session identifier to make sure the right traffic came from (and was sent to) the right person. Approximately a month after implementing the prototype, we noticed some players would mysteriously switch IP addresses in the middle of a session. We added a session ID so the game could handle IP-address switching. A month or two later, we discovered the cause of the address switching. We had been a little too good about keeping data traffic low, and game clients often went many seconds before sending a packet to the server. It turns out the connections were timing out due to inactivity. When the game client tried to send out its next packet, it had to reestablish a new connection and then receive a new IP address. We eventually added a minimum packet rate from the clients during the game to keep the connection alive.

**Closing connections.** As mobile game developers, we wanted to create a great game experience, but ultimately the device is a phone, and a phone has essential functions other than hosting gameplay. Initially, we weren't aggressive enough about shutting down the connection when phone calls and SMS messages needed to get through.

**Frame rate issues.** Toward the end of beta, we found a mysterious bug on a popular handset. We had a difficult time reproducing the bug and could not determine its source. We eventually discovered we were just asking the phone to do more than it could. The frequency of network polls was not leaving the phone enough cycles to update the graphics (and vice versa). To fix this, we created a configuration file that would reduce the frequency of network polls and graphics refresh rates for selected phones.

**2 GAME WAS NOT AS SIMPLE AS WE HOPED (FROM USER PERSPECTIVE).** We knew the game was going to be complicated to build, but we tried to stay focused on making it simple to play. We began informal usability testing in early alpha stage, and continued throughout development. Repeatedly, people had trouble understanding the look-ahead technique we implemented to handle the network latency. UI improvements helped reduce the frequency of these remarks, but they persisted through early beta. Approximately two months prior to the projected ship date, we decided to add an interactive tutorial, which added more than a month to the project. [Many mobile games are developed in just a few months.]

We wanted to keep the tutorial instruction text visible (and scrollable) during the interactive gameplay portion. This left about two to four lines of text per screens at 24 characters per line. We edited and re-edited the text more times than we should have, but it was difficult to limit the text to two screens per chapter. Something about shifting through a dozen pages before playing a phone game made us realize this game was clearly not as simple as we intended.



MOMENTUM's characters were limited to a 16x16 pixel design.



A chat screen lets players converse with their opponents.

### 3 BOOTSTRAPPING MADE STEADY PROGRESS MORE DIFFICULT.

There are a lot of great things about being a small, independent shop. The creative freedom, lack of bureaucracy, and clearly defined roles are great. Yet, there are other aspects that are less romantic, and some slowed down our progress.

Top talent demands top compensation. Sweat equity is nice, but everyone has to eat. Some people love the freedom and control of being independent contractors; others feel more comfortable with full-time jobs from big, stable companies. We lost some key people during the development process, adding a second round of ramp-up time to the schedule.

We were also significantly more cost-sensitive than many other production teams. Although many teams could benefit from paying more attention to expenses, I think this hurt us a bit. For example, we had to control the number of hours external contractors could work on the game in order to control our cash-burn rate. If we had been able to be more flexible with this, we would have delivered the product much sooner. Even small things like buying phones and activating more lines of service would have been pursued more aggressively if we were less concerned about spending.

### 4 BETA TEST: A LOT OF EFFORT, LITTLE FEEDBACK.

We created a web site with logins, beta test agreement, client downloads, and bug-report forms to create a proper beta test program. We wanted feedback on usability testing, some load testing for capacity projections, and some more data points for tweaking the multiplayer interaction (such as optimizing map size, number of coins, speed, lag factor, game duration, and so on).

While many of the family, friends, and business associates we invited expressed interest, we received little usable feedback. The first problem was a fairly complicated emulator download. Beta testers had to download the full Brew SDK from Qualcomm's site, which included a robust registration process. Some were confused about the concept of testing a phone game on their PCs; some didn't want to sit through a big download; others didn't know who Brew was and didn't want to share so much information.

To make matters worse, during the beta test we discovered a strange interaction between the system clock and the emulator, which caused multiplayer synch issues. It took us a while to

realize the multiplayer performance degraded only when there were one or more PCs online. We coded a fix for desktop PCs, but didn't tackle the harder fix for laptops (with power-save modes that added an extra level of complexity). Many beta testers used laptops and were effectively excluded from the test. Overall, we lacked the critical mass required for a beta test that corresponded to the effort we spent to setup and run the test.

## 5 SOFT KEYS ARE USEFUL, BUT ADD TO PORTING HEADACHES.

Most phones use a UI convention known as soft keys. The hardware has a set of buttons just below the screen on the right and left sides. Applications display text labels at the bottom of the screen on the right and left to indicate the functionality currently attributed to the physical soft keys below the screen. We found soft keys a convenient UI mechanism that was presumably well understood by most phone users.

We used static soft keys for navigating menus, selecting options, and responding to dialogues. We used dynamic soft key labels on the tutorial and pre- and post-game lobbies. For example, when a user enters a pre-game lobby, the left soft key says "Back," but the right one varies by context. When highlighting yourself or another player, it says "Info." Pressing the right soft key while a player is selected causes a popup with summary player statistics to display. Selecting an available position changes the right soft key to "Move." Pressing the soft key in this state lets the user change characters.

While porting to various handsets, this soft-key oriented navigation system proved troublesome. Some handsets hard-coded soft key labels (for example, the left label always says "Back" and the right one always says "Select"). Some handsets hard-coded the soft key button functionality (for example, the right soft key always issues a "clear" command regardless of what label you put above it). One handset manufacturer did not pass the soft key press events to the developer's applications (that means pressing a soft key sends no input event to the game application).

While soft keys are a powerful and compact UI mechanism users were already used to, they caused headaches for us in the long run. Ultimately, we developed a configuration file to be read by the application at run time to accommodate things such as key re-mapping and alternate text resources.

## PLAY TIME

Building MOMENTUM was a tremendous experience and will hopefully help us build some momentum for the company. Working with good people in a no-nonsense environment was a good head start. We were allowed to try something new, it worked, and the launch went well. We made plenty of mistakes along the way, but learned in the process.

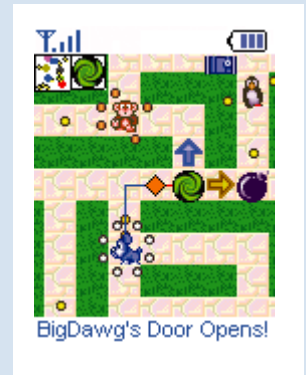
On the development side, the experience validated my expectation that creating multiplayer mobile gameplay is difficult; and creating real-time gameplay is particularly painful. There are other companies making good multiplayer mobile games, and some are ignoring the platform's limitations. I highly recommend playing some of these games before trying to make one. Networks are getting better, but I expect it will take some time for high-speed, low-latency networks to be generally available across the globe.

In the broader sense, I learned that bootstrapping an indie startup was, in-fact, exciting and rewarding. But I now more freely acknowledge the niceties of getting paid up-front and having a dedicated team. We will continue to try to develop and publish our own unique titles, but we are feeling the mounting pressure associated with a small developer self-publishing in this space.

There are several big publishers in the mobile games business, including traditional console/PC game publishers. These publishers have tens of millions of dollars at their disposal. It is still possible for a small company to bootstrap and compete in the mobile market independently, but it continues to become more difficult. Production costs are increasing, particularly with multiplayer and 3D. More funding will be required to produce "AAA" mobile titles in the wake of this "arms race."

Similarly, branded/licensed games are valued by carriers and the licensing fees for these properties are moving beyond the reach of the small developer. In the mobile space, for the most part, the carriers are the retailers, and the big publishers tend to have an easier time getting broad distribution across carriers. And strong relationships with carriers are important in getting your product in the good "shelf space."

In the end, we learned a lot and are thrilled to see our game win positive feedback from the critics. We hope for success with MOMENTUM and plan to release other multiplayer titles in the near future. In the mean time, I'm happy to challenge any of you to a game of MOMENTUM. Just look for me online—I'm "AE." ❖



A mobile phone screenshot of typical gameplay.

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## » THE INNER PRODUCT

## HYBRID PROCEDURAL TEXTURES

**KEN PERLIN FIRST PUBLISHED HIS THREE-**dimensional pseudo-random “fractal” noise function at Siggraph 1984. A few years later, Cook, Carpenter, and Catmull included Perlin noise in their shading language for what eventually became RenderMan. That noise function became the cornerstone of procedural texturing. Now, 20 years after the introduction of Perlin’s noise, GPUs are fast enough to compute noise-based procedural textures in pixel shaders.

Procedural textures offer infinite, non-repeating, high-resolution textures for very little memory. However, procedural textures have issues. GPU cycles are cheap, but they’re not free; we have to think about the value per GPU cycle, and the issues decrease that value to the point where other methods may offer a better tradeoff.

One set of issues is with the workflow in creating procedural textures: It can be difficult to find the right person for the job, since

building textures procedurally is effectively its own discipline. Even with a skilled developer, it’s still more difficult (hence, time-consuming) to create many obvious visuals, at least compared to making a texture map by slapping some pixels on a photograph.

The other problem with procedural textures arises when antialiasing them. Traditionally, procedural textures have been used with offline rendering, either with programs that adaptively supersample to antialias or with the user choosing to re-render bad frames with extra supersampling. Although Pixel Shader 3.0 offers derivative operations that make it more feasible for a shader to antialias itself, very few interesting procedural textures can be effectively antialiased with a closed form computation on a single sample.

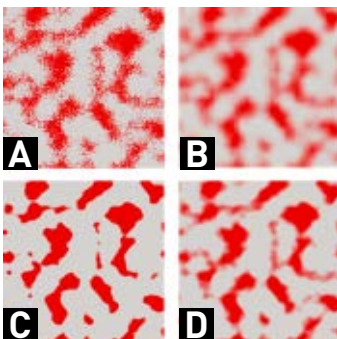
Figure 1 shows a simple procedural texture generated by summing weighted octaves of Perlin noise and using the result (clamped) to lerp between gray and red. The high frequencies cause a dithering effect around the transition regions. A correctly antialiased version of the texture will turn this dithering into smears of intermediate color. The naive procedural texturing solution (see References, page 30) simply throws away the frequencies that are higher than the Nyquist frequency for the current sampling rate (based on spatial derivatives). As shown, this produces a result with no dithering or smearing. It also includes sharp edges because the low frequencies’ amplitude is high enough that they’re not tamed by the lerp. It helps a little to widen the lerp transition region as high frequencies drop out, but not enough; there’s no right amount to widen it to, as the correct result depends on the content of the omitted high frequencies.

It is possible to do better; in *Texturing & Modeling* by David Ebert, F. Kenton Musgrave, et al. [see References], Steven Worley, one of the authors, discusses the intricacies of non-real-time shader antialiasing. He relies on computing multiple noise samples, sorting them, and using sum tables. GPUs are not there yet. At any rate, it seems like black art that must be deployed on a case-by-case basis and requires significant effort.

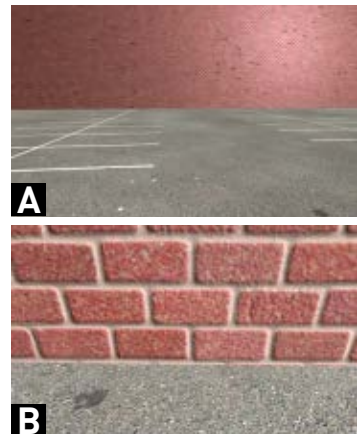
## GOING HYBRID

My friends Chris Hecker and Casey Muratori have a running debate they call “sampling versus synthesis.” They disagree on whether synthesis or sampling best allows a computer to generate rich, appropriate behaviors for any given task. Two examples they’ve discussed are musical synthesizers (physical-modeling synths versus sampling synths) and character animation (procedural/physical locomotion versus animation playback). In the end, they seem to agree on the utility of a hybrid—a sampling synthesizer with resonant filters or a character animation system combining motion-capture with IK.

I think we can find a similar middle ground for texturing by replacing procedural noise and color splines with texture maps. Because we combine them, the textures do not need to be all that large; the textures in Figure 2 use 300,000 and 340,000 texels each, about 400KB and 300KB of compressed textures (assuming 2 bytes per normal-map texel). In return, they cover a fairly large surface area without any obvious repeats.



**FIGURE 1** (A) A procedural texture, (B) a  $1/8^{\text{th}}$  scale mipmap, (C) truncating the high frequencies of the fractal noise, and (D) truncated frequencies and ad hoc transition region.



**FIGURE 2** (A) Two polygons textured with hybrid procedural textures. (B) A close-up of the two surfaces.

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The original UNREAL demonstrated a version of this concept, combining a primary texture with a more finely scaled detail texture and a more coarsely scaled “macrotexture,” the latter intended to reduce the apparent repetitiveness of a texture. This multi-scale treatment is suggestive of “octaves” of Perlin noise; but we need to go beyond just multiplying successive textures together.

Figure 3 shows a brick wall hybrid texture. The base texture is a tiling texture, which has the appearance of the face of a brick. This texture is only 256x256, although higher resolutions or a detail texture might improve things up close. It is rotated slightly so that any noticeable features on it won't reappear on bricks in the same row after only a single tiling. Next, we multiply the base color with a “macrotexture,” but a special one; texture filtering is disabled, and it is aligned so that a brick is exactly covered by two texels from the macro texture. I call this precisely aligned texture a “control texture,” because it is a large texture that controls a smaller scale feature—in this case, the color of each brick. Control textures are particularly important from a memory-consumption standpoint because you can get new texture variations by merely changing the coarsely scaled control texture. This particular control texture is 256x128; it never tiles visibly, and the brick wall is twice as wide as it is high. It also includes an alpha channel that de-saturates individual bricks for extra variety.

The control texture individually colors each brick, but because it uses nearest-neighbor sampling, it leaves hard-aliased edges at the brick boundaries. These are obscured by an alpha-blended mortar texture. The mortar texture defines the color of the mortar between the bricks and, by its absence, defines the shape of the bricks. Although it's not that realistic, I've allowed significant variation between the shapes of the bricks for demonstration purposes. The mortar texture is authored with a rotation, so that it has to be rotated to be aligned correctly with the actual bricks. This allows a fairly small mortar texture, with few unique brick shapes, without causing the brick shapes to repeat too quickly in a single row.

The three textures above (A, B, and C) fully create the brick wall's diffuse texture without requiring much computation. The

remaining three (D, E, and F) provide bump-mapping using similar techniques. The primary normal map is exactly aligned with the mortar texture because it must exactly match the irregular shapes of the bricks and the mortar between them. We could stop here and have a perfectly functional procedural texture, but I've taken one extra step to “sell” it for up-close views.

### SET UP THE BOMB

One traditional procedural texturing technique for adding variation, developed when large amounts of texture memory wasn't available, is called “bombing.” It refers to the semi-regular placement of decal-like images throughout a texture, with varying parameters such as orientation and position (and possibly others for procedural decals with other parameters). Although we could literally apply this technique, again, a hybrid approach seems more useful.

The classic bombing approach starts with a texel coordinate. The texel's location within a large-scale grid is computed as integers. Noise lookups on these grid coordinates determine the properties of the bombed decal for that grid cell—whether there is a decal, its jittered position within the cell, its orientation, and so on. The delta from the jittered decal's position to the original texel coordinate is determined and fed into a decal-rendering function.

We can also do this in a hybrid way. We pack a collection of decals into a single texture. The pixel shader reads from a control texture, which specifies which decal should be used, as well as its orientation and jittered location. A dependent-texture read fetches the actual decal texel to apply at this pixel. One could even apply multiple decals at different scales, using two texture reads for each.

For the brick wall, I'm bombing normal map decals to allow bricks that have been worn or chipped away or otherwise deformed. On the implementation front, I've done something simpler than what's described above, avoiding dependent reads. The decal textures are laid out to exactly line up with bricks. The control texture doesn't indicate jittering or orientation; it simply specifies “on or off,” indicating whether to apply the decal. In fact, it's actually an alpha value; at intermediate values, the decal is less visible. So at any given brick, the choice of decals is limited to whichever one from the

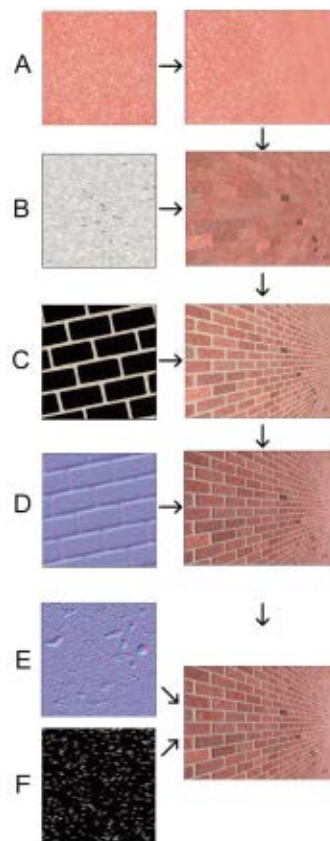
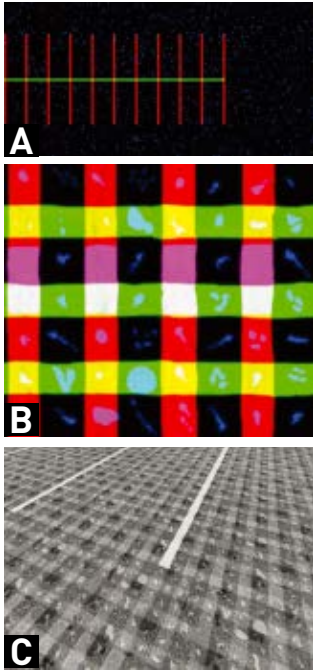


FIGURE 3 Hybrid synthesis of a brick wall texture. (A) A base texture, (B) with per-brick coloring, (C) overlaid mortar, (D) brick and mortar bump-mapping, and (E and F) bump-map decals.

decal texture happens to line up. (Once again, I've authored the decal texture to be rotated off the primary axis, so once rotated to match the bricks, a given decal won't always appear in an obviously limited set of rows and columns of bricks.)

In the brick texture, the bombing is fairly subtle and only really visible up close. The parking lot texture in Figure 2 demonstrates decal application taken further, so that its features predominate. The white stripes, large white blobs, and black stains on the asphalt are all rendered using a single decal texture and a single control texture, shown in Figure 4, page 30. (The RGB channels produce white; the black comes from alpha channels, not shown.)

To produce the painted lines as seamlessly as possible, the horizontal and vertical lines are computed separately. Because the decals are just a single color (white), I used the red, green, and blue channels as three separate decal overlays, all white. Combining the control and decal textures just requires a single dot product,



▲ **FIGURE 4** Two textures whose dot-product controls placement of white paint for creating a parking lot. (A) The control texture, (B) the decal texture, and (C) the composite applied to asphalt, with all decals partially visible.

the output of which is used as an alpha to apply a constant white color.

In the red channel, I encoded four different rough-edged “painted” vertical lines. (The control texture spaces the lines at a nonmultiple of eight so that adjacent painted lines use different decals.) In the green channel, there’s a collection of “painted” horizontal lines (although in the end I only used one of them). The control texture contains red where the vertical lines go and green where the horizontal lines go. Where they intersect, both are drawn. This may be slightly more opaque, which is fine because that’s how parking lots are actually painted. This separation is necessary, though; if there is only a single decal layer, you’d see little stubs of the opposite direction appearing repeatedly along the length of the lines.

The blue channel is used to drop random splotches of white (which may or may not be paint) to break up the asphalt texture; the alpha channel is computed separately and used to control a blend of a black color, creating

black blobs, possibly oil and other car fluid stains. (This control texture is random; a more carefully authored one would put these mostly in the parking spaces where they might naturally appear.)

Although the use of the dot product on three separate channels is a clever trick, it’s perhaps too clever for its own good; the RGB channels are not internally correlated, and texture compression won’t be effective for them. The storage estimates assumed earlier that these textures take 16 bits per texel.

### WORKFLOW AND ANTIALIASING

In terms of avoiding visual repetition, hybrid textures strike a middle ground between procedural textures and plain texture maps. Perhaps unsurprisingly, they also strike a middle ground between the two in terms of the workflow and antialiasing issues I mentioned before, hopefully a tractable one.

I used some clever tricks to get these effects: disabling bilinear filtering, authoring rotated textures, separating horizontal paint lines from vertical ones, and using a dot product for efficiency. These are programming tricks; I don’t think they’d be easy for artists to come up with. However, I think there are probably a number of tricks like this that are efficient enough that a programmer and an artist can devise a set of them upfront, giving them a nice but fairly limited layer-based shading tool that uses mostly plain old texture maps. Even if you want to get clever on every texture, you wouldn’t need much programmer time; in my limited experience, time spent authoring texture maps dominates the field.

Antialiasing is tricky, but this is the nature of any pixel shader that does more than just alpha blend. Merely multiplying two textures together produces a result that’s no longer linear; it won’t be correctly antialiased if the two textures are correlated. This may seem surprising, considering how long dual-texturing graphics hardware has been around, but most of our experience has been with lightmaps and detail textures, which typically aren’t correlated with the primary texture. However, control and decal



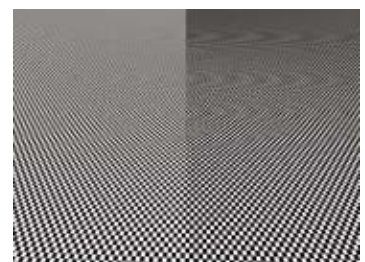
**FIGURE 5** On the left is a checkerboard texture; on the right is the same texture modulated with itself. They appear identical in the foreground, but the right texture darkens incorrectly into the distance because texture filtering is inaccurate antialiasing if a pixel shader processes the texture non-linearly.

textures are often correlated; for example, the white lines in Figure 2 (A) are more aliased than they would be if authored into a texture.

The most correlated a pair of textures can be is when they’re the same texture. Figure 5 shows a contrived example of this, multiplying a checkerboard texture by itself, demonstrating that texture filtering is a poor approximation to antialiasing. A correctly antialiased result, like you’d get from supersampling, would sample several locations from the source texture (each of which would be 0 or 1), then square each one (still 0 or 1), and then average the end results together (0.5). Texture filtering (both the limited anisotropic filtering in the mid-ground and the mipmapping in the distance) samples several locations in the source texture (each 0 or 1), averages them (0.5), then squares that in the pixel shader (0.25). The result is a texture that gets much darker in the distance (due to mipmapping), as well as having more significant aliasing artifacts (because the artifacts are squared).

The lesson seems to be that alpha-blending is perfectly safe, and control textures that bomb decals are fine so long as the decal is significantly smaller than the size of the control texel. As the size becomes similar, aliasing occurs; it’s most visible on extended features, but even single decals can shimmer somewhat. It might be possible to improve the results by preprocessing the mipmaps in some non-linear fashion, but I’m not sure, and that adds more complexity to understanding authoring them. In the long run, hardware supersampling should replace multisampling and things will get better.

The examples I’ve described here have been highly structured, semi-regular textures. I’ve also done some experiments with irregular textures; simply bombing decals works okay. But care must still be taken to avoid obvious repetition in the base texture map, and I haven’t yet figured out a good way to do this procedurally. Solved or not, the source code and data for what I’ve tried, including the brick wall and parking lot textures, are available on [www.gdmag.com](http://www.gdmag.com), along with an executable for GPUs that support GeForce 3 shaders. ❖



### REFERENCES

Steven Worley, “Advanced Antialiasing,” Chap. 5 in *Texturing & Modeling: A Procedural Approach*, 2nd ed. Morgan Kaufmann, 1998.

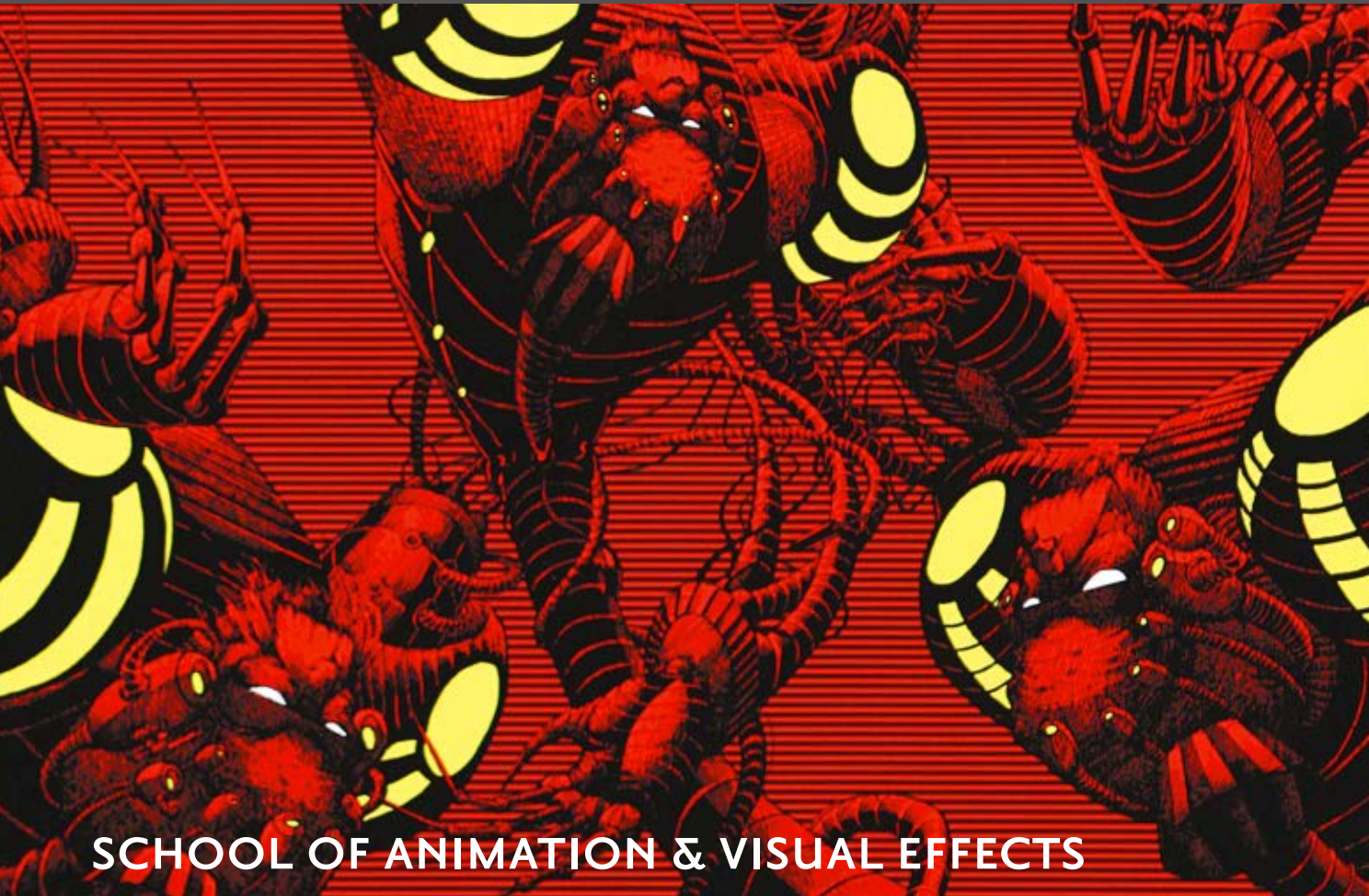
[www.renderman.org/RMR/Books/sig92.course21.pdf](http://www.renderman.org/RMR/Books/sig92.course21.pdf) is redundant to *Texturing & Modeling* but is available for free online. It includes the section called “Texture Generation” by Darwin Peachey, which covers the basics.





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# PIXEL PUSHER

## WHY BE NORMAL?

*Dear future readers, Thanks to the miracle of printing technology, you're reading this column in the early fall. But I'm actually writing it in the heat of early August. Among other things, that means that back here we're all grooving on the newly released DOOM 3. This month, we're going to focus on one of Doom's signature technologies, normal mapping, which has the potential to radically change the way we make art for real-time games. We're going to take a look at the process and how it's going to change the way we do our jobs.*

**FIGURE 1** Because bump maps create normal information indirectly, sharp details are strangely mutated by the bumping process.

### OFF TO A BUMPY START

Let's start by considering what normal mapping isn't. Normal mapping is not just an up-market synonym for bump mapping. Even in August, bump mapping is an old idea. A bump-map texture depicts an offset away from the actual polygonal surface of a model; each pixel's value tells the

renderer how far off the surface that pixel ought to be. At render time the computer basically wraps an imaginary surface around these offset pixels. It then transfers the lighting of that fake surface back to the original polygonal surface. Where the fake surface catches more light than the "real" one, you'll see highlights, and where it catches less, you'll see shaded relief. It's hardly necessary to point out how handy this is for all sorts of little surface details that don't merit geometry of their own.

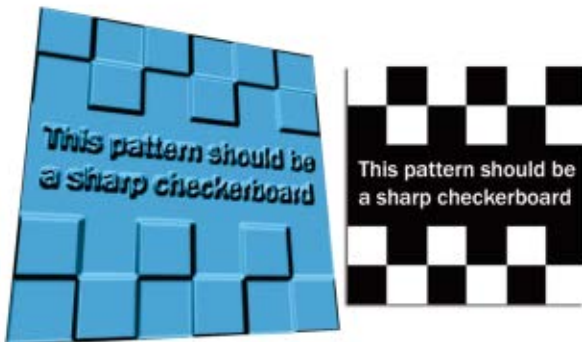
Of course if you've used bump maps, you know that they often produce very disappointing images. The difficulty lies in that second step: wrapping an imaginary surface around the bumped pixels. Unfortunately, the wrapping methodology limits the kinds of details you can represent. If you imagine the wrapping process as wrapping a piece of cloth around the nubbed, pixilated surface of the bump-mapped object, you can see why a bump map has difficulty representing fine details and sharp transitions. While the rough contours will be correct (the high parts of the bump texture will be high and the low parts low), the actual slope of the surface under the "cloth" will be recreated as an approximation by drawing a new "surface" through the height samples. Consider the hypothetical bump map in Figure 1. The grayscale values in the bump map would seem to make a sharp plateau in profile, and yet the results, as you can see, give a distinctly soft-edged, beveled look. Figure 2 shows how the normals are generated in the sample

image and how they cause the unwanted beveling effect.

Normal maps are also used to shade a simple polygon surface as if it had more complex geometry. Where bump maps do this indirectly, by indicating where the surface "ought" to be, normal maps cut out that theoretical "wrapper." Instead, they store the normals of the complex surface directly as RGB values. From the standpoint of the renderer, this has the advantage of simplicity. Instead of having to recalculate the theoretical surface from the height map on every frame, the renderer simply does a texture lookup. This is why bump maps, even though they've been everywhere in offline renders for a decade or more, are still rare in real-time graphics, while normal maps are the flavor of the month in graphics hardware demos.

### THE SHAPE OF THINGS TO COME

Unfortunately for artists, there's a serious catch. Bump maps make intuitive sense—it's fairly easy to make the mental translation between grayscale values and surface heights. Normal maps are very hard to decipher or paint by hand (see Figure 3). Not only is it much harder to visualize how the subtle shades of an RGB image will turn into surface contours, the meaning of the RGB colors is dependent on the normals of the real geometry. Even if you are able to divine what a particular shade of lavender or puce will mean on one triangle, it's never guaranteed that it will mean the same thing on another. For all



**FIGURE 2** How a height map is interpolated into a shaded render: The shading information is generated by a surface wrapped over the height field of the bump map. The interpolation of the shading surface produces the beveling effect in Figure 1.



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practical purposes, normal maps can't be created by hand. They have to be created by turning real geometry into texture.

Obviously, this means that normal mapped assets need to be built twice. The first edition is in game form, with texture and polygon budgets appropriate to real-time rendering. The second is a source model, and you can lavish polygons and texels on it as if you worked at the Skywalker Ranch. The resulting model is then projected onto the game model through a process somewhat like shrink-wrapping. Typically this step is called casting because the projection algorithm walks through the UV space of the game model and casts out test rays from each pixel to find the nearest point on the surface model. The color and surface normal direction (and sometimes values in other textures, such as specularity or luminance maps) are then written back into the texture of the game model. The result is what we've all seen in *Doom* and *FAR CRY*: models with surprisingly little geometry that light as prettily as million-polygon subdivision models.

As always, of course, this new power has a price. A lot of the traditional texturing and modeling pipeline is going to be twisted in a knot as normal mapping becomes the next gotta-have-it bullet point in publisher's pitch meetings. In essence, the different skill sets that once pertained to real-time and cinematic modeling and texturing are going to converge, and this will mean everyone is going to have to give up some cherished habits. Let's take a look at how this change will affect specific art-creation specialties.

## BRING ON THE POLYGONS

It might seem odd to say this about a texturing procedure, but normal mapping is going to drive serious changes in how low polygon models are built. Until now, polygon counts have been driven by two major demands: form and shading. The overall shape of an object, of course, determines the baseline need for geometry. But in conventional Gouraud-shaded models, vertex counts translate directly into higher quality shading. This means that, up to now, many areas that

scarcely affect the overall form of a model still cried out for extra polygons—anything from the muscles of a torso to the curve of an airplane's wing seemed to need extra detail. With normal mapping, though, the shading is going to come directly from the normal map, so vertex count no longer has any bearing on the visible smoothness of areas not seen in profile. Consider Figure 4. Every low-poly vet knows how to hide the ends of a cylindrical shape with a higher-poly count cap. Of course we're also familiar with the unsatisfactory lighting that derives from trying to get six or eight segments to stand in for an entire curve. With normal mapping, though, the shading of a curve segment will be perfect even if the "cylinder" is nothing but a flat quad. Normal mapping means you can be a lot more aggressive in polygon reduction than before, whereas today's typical Gouraud-shaded character might run several thousand polygons, the normal mapped character models in *FAR CRY* shaded very nicely with as few as 1,500. At the same time, it's still possible to be too aggressive—as some critics have noted, the complex shading of *Doom* characters loses some of its luster when juxtaposed against brutally polygonal outlines (Figure 5). The short story is that a lot of old instincts for low-poly modelers will have to be relearned. A lot of vertices that used to be needed for shading control will go away, but at the same time we'll have to give more careful consideration to getting proper silhouettes.

On the high-resolution side of the equation, there's good news and bad news. The bad news is that a normal mapping workflow means building everything at least twice: a high-resolution original and a game-resolution final asset. This is going to strain a lot of people's scheduling skills because the high-resolution assets are going to be loaded with polygons and textures. Creating good source art with lots of detail is unquestionably going to demand more modeler time. The good news, though, is that the high-resolution models don't need to be efficient in any way; you can forget about making painful choices and throw both polygons and

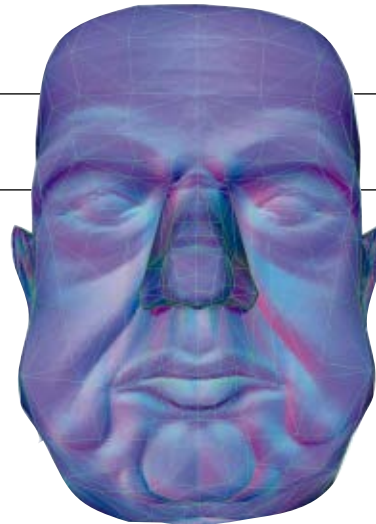
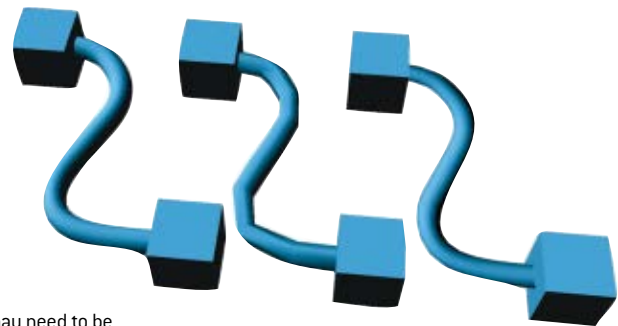


FIGURE 3 Normal maps encode the X, Y, and Z vector of the surface normal into the R, G, and B channels of a texture. The resulting textures are almost impossible to paint well by hand.

texels around like a sailor on shore leave. You'll be able to indulge in every cinematic modeler's obsessions—hundreds of hand-placed rivets, fully modeled belt buckles, and so on. Of course, these indulgences aren't free—every nut and bolt will still need at least a rudimentary texture, and the interactive performance of your art package is going to break down eventually. Experienced cinematic modelers will be used to the management problems that come with myriad polygons, but if you've been accustomed to lightweight models, you



may need to be more careful about display layers, naming conventions, and object instancing to cope.

## FULL AUTOMAPPING

UV mapping strategies for low-poly models are also going to undergo something of a revolution. Obviously, making a texture using a normal casting process means no hand painting. This, in turn, changes the cost-benefit equation for figuring out how best to UV-map your game assets. As we mentioned in last month's discussion of UV mapping, normal mapped models are an excellent application for automatically generated auralic mapping. The biggest drawback of automapping is its tendency to produce fragmented maps that make no sense as a canvas for texture painting;

FIGURE 4 Two ways of approximating a tube: The center and right examples have the same poly count. Because the normal map on the image on the right handles the shading information, the extra polys can go into making a smoother profile instead.

CONTINUED ON PG 63



MARC MENCHER

## NECESSARY EVIL

# RECRUITERS WE LOVE TO HATE

### ALONG WITH LAWYERS AND USED CAR

salesmen, recruiters often fall into the category of people we love to hate. But an experienced, ethical, and competent recruiter can mean the difference between your dream job and no job at all.

What exactly does a recruiter do? Briefly, a recruiter matches job candidates with open job positions. For example, if Pickle Pants Entertainment is looking for a programmer, a recruiter will help find the right person to fill that position. Pickle Pants then pays the recruiter a fee if they hire that programmer.

But what if you're in a high demand/low supply position? What if you're a PS3 programmer? Why even use a recruiter? Why should anyone use a recruiter? If you went to the hypothetical Pickle Pants web site, you would probably find company job openings and contact information where you could send your resume directly. Why even bother with a recruiter?

### RECRUITERS AS NECESSITY

There are thousands of computer game companies in North America alone. By using a recruiter, you don't waste your time searching for open jobs. And even if you have plenty of time to conduct such a search (not necessarily a good career sign), be prepared to join the crowd. At the "Trends in the Hiring Trenches" panel at E3 this year, one of the panelists, a staffing manager from a developer/publisher, reported receiving approximately 15,000 resumes a year. Your resume lands somewhere in that



15,000 until the busy human resources staff has the time to sort and distribute them to the appropriate hiring manager. Good recruiters, on the other hand, have long-term relationships with hiring managers, and with one phone call, e-mail, or IM, they can get your credentials quickly and directly to the right person.

Next, although rarely discussed, one key function of a recruiter stems from the frank feedback they receive from the company on how you performed in an interview. Thanks to the litigious ranks who have preceded you in the business world, hiring managers are reluctant to give honest feedback directly to a job candidate. However, they usually feel completely free to give the recruiter the real low-down on what transpired. Armed with this candid information, an effective recruiter can either clean up the "mess" and still get you the job offer or, at a minimum, have you prepared so you don't make the same mistake in your next interview.

Tales of people packing up and moving across the country for a new job, only to be let go two weeks later, are legion, unfortunately. However, because recruiters are paid by the company, not the candidate, if a company can afford to pay a recruiter's fee, they're not in it for the short-run. That is, companies who work with recruiters are typically more financially stable.

Finally, a recruiter who is focused on the game industry market will know what your salary level should be, compared to others who have similar skills. If you have not done the best job in the past negotiating your base salary and benefits, a good recruiter can help you in this area.

### RECRUITERS AS EVIL

If all of the above is true and recruiters are so dandy, then why the bad reputation? Why are they a necessary "evil"? Professional, ethical, and well-established recruiters play out the above scenarios, but the bad rep comes from recruiters who, for example, scan job ads, match buzz words off your resume, and spam out your resume—often without asking your permission—risking your confidentiality.

The best way to avoid these bad recruiters and find the good ones is by word of mouth. A good recruiting firm should have an established reputation in the game industry. Ask friends and colleagues. Or keep it confidential and do some research. Well-established recruiters frequently appear as contributors in game industry publications, as well as on panels at trade events, such as GDC and E3.

Necessary evil? Ultimately that's for you to decide. But work with the right recruiter and your career could very possibly enjoy the fruits of his or her labor. ❖

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**MARC MENCHER** has worked in the game industry for 16 years. He is the founder of *GameRecruiter.com*. Comprising seasoned industry veterans, his firm focuses on unique and unadvertised game industry jobs. Confidentiality assured! E-mail him at [mmencher@gdmag.com](mailto:mmencher@gdmag.com).



## GAME SHUI

# RECURSIVE FLEAS

### THE CONCEPT OF ENDLESS LEVELS OF

hierarchy is not new to most game designers—and certainly not to programmers, particularly if they've learned languages like LISP. However, I'm not thinking about the recursive aspects of programming, but rather of my favorite topic—rules of game design.

Let's start with a player's perspective. Adam is an inexperienced gamer, playing a first-person shooter against some of his buddies. Initially, he is just concerned with low-level tactics, like which weapon to go for first or even how to move around. Gradually, he masters those low-level concepts and starts to explore more complex tactics, like strafing as he rounds corners and finding good places to snipe at his opponents. Eventually, he will move on to strategic considerations, such as learning to cooperate with team members or waiting until he knows an opponent is low on ammunition before attacking him. The point is that he gradually masters and adds to his play style higher and higher levels of understanding of the rules of the game.

### CHEATERS AND LOOPHOLES

Eventually Adam will start to think outside the game rules. Perhaps he will develop tactics that make use of the real world, calling one of his opponents on the phone to distract him the instant Adam strikes or exploiting a known bug or weakness in the program. Now he has entered a realm called metagaming, meta- being a prefix meaning beyond or transcending. Interestingly, this is a level where game designers must work all the time, deciding on the internal rules of the game in order to maximize the player's enjoyment, but also considering the higher-level considerations, such as, "What happens if the player does this counter-intuitive thing?" I first experienced this when helping test the arcade game *Joust* in 1982. Players found a loophole that let them defeat the "unbeatable" pterodactyl consistently and play for hours on a single quarter. We had to issue a new set of ROMs to all the arcades that had bought the early version of the game to correct this problem.

One of the paradoxes that designers have to contend with is that players are constantly looking for these loopholes to eagerly take advantage of them. They will do this even if they ruin their enjoyment by making the game too easy. And then they will complain that the game is no fun: "I found a bug that gave me unlimited ammunition and finished the game in an hour, so I returned it to the store." So designers are obliged to anticipate these player impulses and come up with built-in cheat codes that do not ruin the game or (at least) require the player to acknowledge that they are cheating and so hopefully take responsibility for any decrease in enjoyment: "I finished the game in an hour, but I used the cheat codes, so now I'm going to try to do it without cheating." Designers spend a lot of time thinking about how to structure the internal game rules to maximize enjoyment while

staying within the bounds of what can be built into a game by the team within budget and schedule (or at least they should be thinking about that).

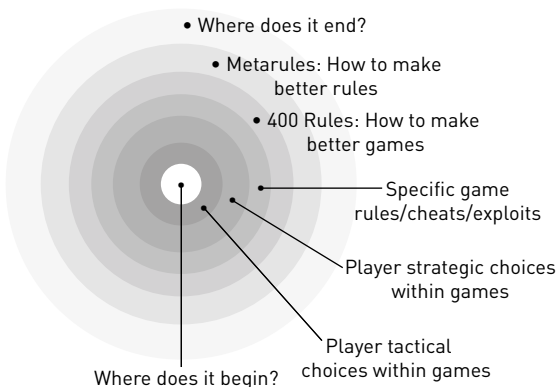
### I NEVER META RULE I DIDN'T LIKE

But there are rules that are concerned with the metalevel above that, too. That's the domain of *The 400 Project* rules, providing ideas about good game design practices that in turn can help designers figure out how to structure the rules that define their games to maximize their effectiveness. Rules interact in various interesting ways and it is up to the designer to judge which must take precedence to maximize fun or to balance the tradeoffs between the ideal and the reality. Regular readers of this column have seen "is trumped by" and "trumps" paragraphs for each rule presented here. Trumping information concerns these tradeoffs—follow Rule A, unless Rule or Situation B applies.

But the 400 rules aren't the end of the line either. There are metarules that affect the rules I publish here. As with the other examples of rules hierarchy, until you've mastered the lower-level rules, it's sometimes difficult to perceive the rules above them. A couple of the metarules I alluded to in the previous paragraph (which I hope to consider in more depth in future columns) can be briefly summarized as "Game design is all about fun" and "Game design is all about tradeoffs." Experienced designers will realize the essential truth of both statements, but also the paradoxes inherent in them.

### THE LITTELST FLEA?

So where does it end? Game developers should get a double message from Swift's verse above. You don't have to take his word for it—on a metalevel, we also know that no matter how hard you try to get rid of bugs in a game, there's always another one waiting to bite you. ❄



**NOAH FALSTEIN** is a 24-year veteran of the game industry. His web site, [www.theinspiracy.com](http://www.theinspiracy.com), has a description of *The 400 Project*, the basis for these columns. Also at that site is a list of the game design rules collected so far, and tips on how to use them. You can e-mail Noah at [nfalstein@gdmag.com](mailto:nfalstein@gdmag.com).



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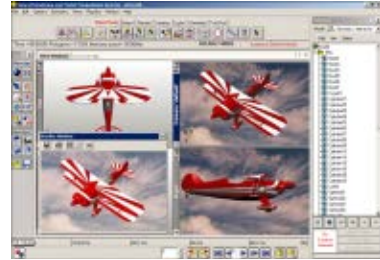


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Okino's **PolyTrans** (and its sibling **NuGraf**) have been synonymous with 3D game development for the last decade. PolyTrans is an industry standard toolset that implements a universal 3D data translation pipeline between all major 3D DCC, CAD and VisSim file formats, as well as all major 3D animation programs including 3DS MAX, Maya, Lightwave, XSI, FBX/MotionBuilder and most others. The special purpose **PolyTrans-for-3DSMAX** and **PolyTrans-for-Maya** native plug-in systems provide highly refined bi-directional conversions of scene/geometry/animation/skinning/skeleton data between 3DS MAX and Maya.

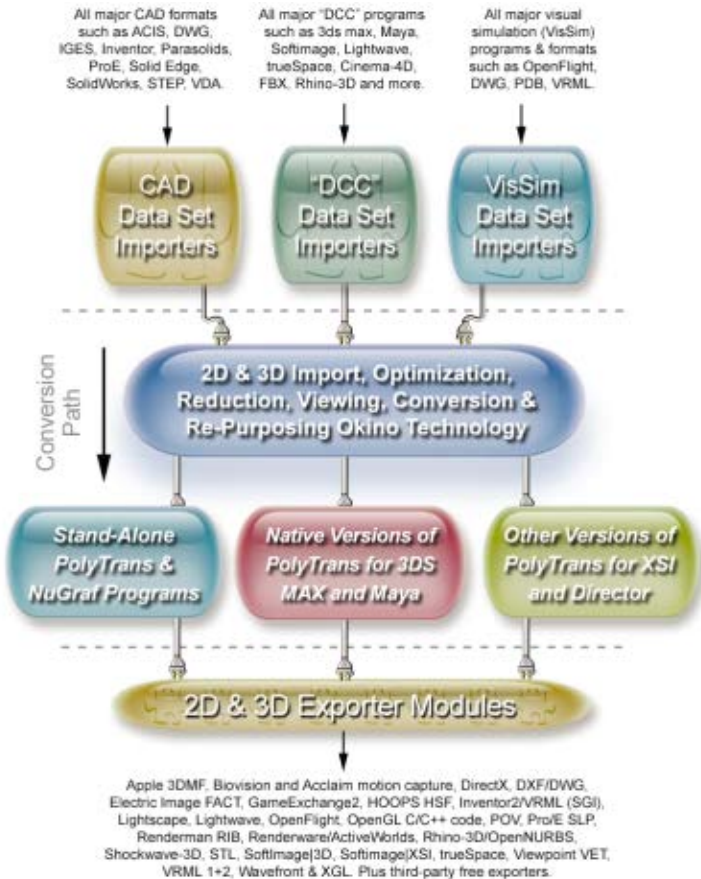
Of particular interest to our 3D game developer users in 2004 is our production worthy, bi-directional skeleton, mesh skinning and animation conversion support between 3DS MAX, Maya, XSI, Lightwave, DirectX, FBX and BVH/Acclaim. Using our unique *Arctic* toolkit for processing, these pipelines handle all the problematic conversion cases including automatic bone re-alignment, off-axis scale removal or propagation into child animation curves, capturing dense procedural or non-transportable animation, frame zero re-alignment and (most importantly) dealing with all the differences in how these various 3D programs handle and interpret skinning weights.

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\*To obtain an evaluation copy of CodeWarrior tools, you must be a licensed developer with Sony Computer Entertainment (SCE) and /or Nintendo.

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# metrowerks™

## CodeWarrior™ Game Development Technology – Stable, High Performance, Full Featured

Metrowerks provides a complete suite of development options, enabling titles to stay on schedule and ship on time. Leading studios and publishers have come to depend on Metrowerks technology from compilers, to debuggers, to analytical tools, to IDE — We understand game development, and have been in the industry since 1996. We offer development and analysis tools for the Sony PlayStation® Portable, Sony PlayStation®2, and NINTENDO GAMECUBE™, including support for leading third-party plug-ins. Our customer roster includes the world's top console game developers and publishers. Look under the cover of best-selling console games and you will see CodeWarrior™ game development tools in action.

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**CodeWarrior Game Development Tools for NINTENDO GAMECUBE™** — Includes a highly optimized C/C++ compiler and an assembler designed for the GAMECUBE processor, plus a wide array of debugging support including C++ browsing for all available GAMECUBE development systems.

**CodeWarrior Analysis Tools** — Analyze and optimize your game with CodeWarrior Analysis Tools for the NINTENDO GAMECUBE™ and/or PlayStation®2 consoles. An intuitive GUI provides easy navigation — results are displayed graphically in charts, lists and call graph trees.

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*“CodeWarrior Analysis Tools are an invaluable asset to Stormfront’s development cycle. The hierarchical profiler helped us quickly and effectively eliminate bottlenecks, and the code coverage tool was very helpful in improving our quality assurance process. CATS was a key tool in helping us ship Demon Stone on schedule.”*

**Ken Chao, Technical Director, Stormfront Studios**

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## IT GlobalSecure & SecurePlay – Security in a New World

The games industry is entering a new era. Online play is important to virtually every new game. Interconnected players and new business models make security a critical requirement. The demand for connected game consoles and emergence of wireless gaming only accelerates matters. IT GlobalSecure's SecurePlay multi-player middleware provides a powerful cost-effective solution for stopping cheating. Our engineering services can help you fulfill your complete security needs.

### SecurePlay

SecurePlay redefines multi-player middleware. Developers are faced with an explosion of platforms: from consoles to PCs to cell phones and set-top devices. SecurePlay was built from the ground up to support multi-player gaming on multiple platforms over multiple networks.

Online play is key for most games today and cheating is an increasingly important issue. While low levels of cheating can be tolerated, as cheating worsens, problems grow exponentially. SecurePlay uses custom game transaction protocols to stop cheating. We give licensed developers documented source code so they will be confident in its security and be able to tailor SecurePlay to fit their needs.

SecurePlay is available in C++, Java, and Flash for a wide range of platforms and networks.

**SecurePlay Casual** provides the components for traditional games. Whether you are dealing cards, rolling dice, moving hidden pieces, or creating the first Massively Multi-Player Rock-Paper-Scissors game, SecurePlay Casual delivers a complete, secure solution.

**SecurePlay Pro** - Action, RPGs, RTS, Racing games, and shooters – underneath the surface they share many common features. SecurePlay Professional adds real-time and event driven transaction support and tools to quickly synchronize and distribute data. Together with the capabilities of SecurePlay Casual, SecurePlay Pro meets the needs of most online games.

**SecurePlay World (2005)** - Persistent play and online communities are creating new business opportunities thanks to Internet and wireless communications. SecurePlay World addresses many of the unique security problems that these games present.

### Services

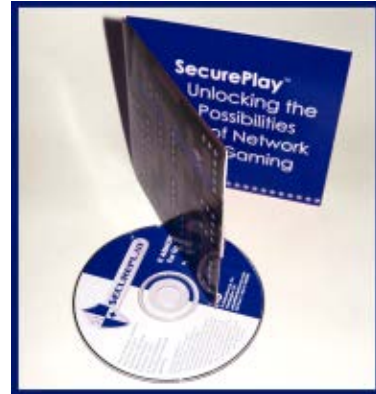
**DRM, Licensing Protection, and Distribution Security** - Our team can help identify and implement your content protection strategy. Whether developing custom cryptographic solutions, evaluating commercial products, modeling costs, or recommending procedural changes, we work with you to protect your business.

**Custom Anti-Cheating Solutions** - Studies have shown that over sixty percent of players are very concerned about cheating. To keep players and tap recurring revenue streams, stopping cheating must become a central part of game design.

**Security Engineering** - The games industry has virtual assets and online services that customers pay real money for. While this is an exciting business opportunity, it exposes game companies to attack from hackers and online criminals.

We also deliver a complete range of traditional engineering and project management skills. Senior engineering skills are scarce. Get help with independent reviews, technical evaluations, and thorny design issues.

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### SELECTED FEATURES

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### Develop a More Stable Console Game... On Schedule

dfc-gorilla™ is a development tool for console and PC game developers that enables efficient updating of gigabyte sized files.

dfc-gorilla is used to reduce the size of on-line updates of development-in-progress titles to testers, remote collaborators, etc. (often the recipient is the publisher). By reducing gigabyte sized updates by 90-99%, developers are able to more quickly provide updates/fixes, resulting in an improved and more efficient QA process. dfc-gorilla has proven to be particularly useful as the deadline looms in the final stages, during the tweaking/fixing phase, when the variations between successive images are minimal. dfc-gorilla allows game developers to perform more test iterations in the same time period (one developer reported 12 test iterations instead of the usual 2). The clear benefit is on-time delivery of a more stable product.

### RTPatch: The Gold Standard for Online PC Game Updates

RTPatch® is for your PC game-playing customers. RTPatch is designed specifically for software updates and contains the features and capabilities necessary for the complex process of updating distributed software. RTPatch dramatically reduces your gamers' download time for updates, new levels and fixes, producing more time to enjoy your game. RTPatch's typical size reductions for updates are in the 90-99+% range.

RTPatch enables you to update a file or system with a patch containing only the bytes needed to change the old file or system into the new file or system. Different versions of old files can be updated to new files with a single patch. RTPatch supports both Windows Installer and non-Windows Installer installations and works with your current update delivery system, or you can make use of one of the automatic or browser-based delivery systems included as standard features.

RTPatch is the patented gold-standard for PC game updates. It was originally released in 1992, and is now in its 8th major revision.



The X-Forge® 3D Game Engine is a complete C++ based multiplatform game engine and SDK for developing advanced 3D games for major mobile platforms. The solution includes our binary libraries optimized for all major mobile technologies, high level game engine source libraries, tools for artists and packaging, extensive documentation and world class support services. Everything the professional game developer needs to create amazing 3D mobile games.

Customers such as Sega, THQ and many others are bringing existing brands to the mobile space through X-Forge. Independent developers around the world use X-Forge to create new and innovative titles for emerging platforms. X-Forge Powered titles form the cornerstone for new mobile gaming centric devices such as Nokia's N-Gage and Tapwave's Zodiac. With over 100 licensees and 20 commercial titles already launched, X-Forge truly represents the game developer's choice for the mobile game industry.

**X-Forge provides**

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- Familiar game development APIs and tools
- Instant access to multiple mobile platforms, current and future
- Leading edge 3D game technology and performance
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- Professional and extensive documentation and interactive support-

**The X-Forge SDK consists of five parts: X-Forge Core, X-Forge Game Engine, Tools, Example Code and Documentation.**

The X-Forge Core is the binary low-level layer of X-Forge and includes all the fundamental components used by basically all game applications including graphics, audio, input, event handling, memory and file system management, and wireless communication protocol such as Bluetooth and WiFi. This layer also provides operating system and device hardware abstraction. All the other parts of X-Forge sit on top of the Core. X-Forge provides an optimized 3D software rasterizer, but also works with standards such as OpenGL® ES and is architected for full support of mobile 3D hardware acceleration.

The X-Forge Game Engine contains many powerful high-level components which can be used within the game application itself. The components include the 3D world system (game graph), collisions, physics, multi-player system, AI framework, UI toolkit and more. Source code is provided so that developers can customize the components or integrate their existing game code.

The X-Forge toolchain is highly integrated with 3ds max®. Every aspect of X-Forge is exposed, giving artists full control over content creation, all the way from modeling to specifying collision and physics properties for game objects. 100% accurate previewing is possible thanks to the embedded previewing window, considerably reducing the time needed for testing.

The SDK also contains comprehensive documentation in both English and Japanese, and extensive example code including full game framework and specific engine features. Interactive support is provided through a robust developer website as well as training and code reviews.



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Resumes and Job Inquiries:

[jobs@bluefang.com](mailto:jobs@bluefang.com)

**BLUE FANG HISTORY**

- › Summer 1998  
Blue Fang Games Company Formed
- › Fall 1999  
Zoo Tycoon concept developed
- › Fall 2000  
Blue Fang signs Zoo Tycoon publishing deal with Microsoft®
- › Winter 2001  
Zoo Tycoon released
- › Spring 2002  
Zoo Tycoon: Dinosaur Digs expansion pack released
- › Winter 2002  
Zoo Tycoon: Marine Mania expansion pack released
- › Summer 2003  
Zoo Tycoon: Complete Collection released
- › Spring 2004  
Zoo Tycoon franchise surpasses 4 million units sold worldwide
- › Fall 2004  
Zoo Tycoon 2 will be released

# BLUE FANG GAMES



## About Blue Fang Games™

Blue Fang Games develops high quality, award winning PC games. Founded in 1998 by veterans of Papyrus Design Group, Blue Fang is dedicated to delivering entertaining interactive computer game titles to consumers around the world. Blue Fang's Zoo Tycoon™ franchise, published by Microsoft Game Studios, has consistently been in the top 10 sales for PC games in the United States and has sold over 4 million units worldwide. Blue Fang's experienced team of game developers and designers utilizes a proprietary project management system that delivers high quality games that are on time and on budget. Blue Fang is now hard at work developing Zoo Tycoon™ 2, which will hit stores in Fall 2004.

At Blue Fang, we take great pride in the overall quality of the games we make, as well as our continuing ability to meet our deadlines, respect and support our employees' quality of life, and above all to enjoy what we're lucky enough to do for a living - make games. We offer competitive salary and benefits, including profit sharing, comprehensive health, 401(k) and dental plans. If you're interested in joining a still relatively small team that is passionate about making great computer games and you have the right qualifications, we certainly want to hear from you.

To learn more about Blue Fang Games and view current job postings please visit our company website at [www.bluefang.com](http://www.bluefang.com). Art and Engineering positions are currently available.

## Blue Fang Portfolio

- › Zoo Tycoon – 2001
- › Zoo Tycoon: Dinosaur Digs – 2002
- › Zoo Tycoon: Marine Mania® – 2002
- › Zoo Tycoon: Complete Collection - 2003
- › Zoo Tycoon 2 – Releasing Fall 2004

## Blue Fang Award Highlights

- › Zoo Tycoon: Complete Collection  
Academy of Interactive Arts and Sciences (AIAS) Computer Family Title of the Year Interactive Achievement Award – March 2004
- › Zoo Tycoon: Complete Collection  
Parents' Choice Foundation Gold Award – Fall 2003
- › Zoo Tycoon  
Bologna New Media Prize - 2002

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# Seapine CM™

## Winning Game Development with Seapine CM

Game development is a team effort with designers, graphic artists, developers, testers, beta sites, and managers all working toward one goal – delivering the next mega-hit on time with no bugs. Seapine CM—the complete change and issue management solution from Seapine Software—manages your team's development issues, beta-site feedback, and digital assets including source code, design specifications, character models, sounds, image files, specifications, and more. Seapine CM promotes team collaboration with features such as advanced code branching, secure remote access, the ability to link code changes to issues, file versioning and archival, and flexible integration into your development and build processes.

### Accelerate your development effort through better collaboration

From tracking the who, what, and when of your team's file revisions to providing one-click access to bug histories, Seapine CM helps you manage your projects more effectively. Monitor quality control statistics such as who reported the most bugs, how many bugs are still open, or how much time a user spent fixing bugs for increased defect tracking efficiency. Easily archive and retrieve virtually any file for improved change management. Keeping track of your team's digital assets is simple with Seapine CM.

Tracking file versions has limited benefit without a structured branching methodology. Seapine CM features unlimited branching to accommodate your team's development processes. Seapine CM's workspaces provide private branches for each team member, enabling the team to work independently on a common code base. Each team member's private branch protects his or her code base from changes promoted by other team members.

### Manage change your way

With Seapine CM you know not only what files changed but why. Seapine CM combines two full-featured development tools, TestTrack Pro and Surround SCM, into a change management powerhouse. Award-winning TestTrack Pro is a flexible, multi-user issue management solution with comprehensive workflow and issue routing. Use TestTrack Pro with Surround SCM to associate source changes with defects, change requests, and feature requests—even while checking in changes from your integrated development environment.

To maximize productivity, change management tools should seamlessly integrate with your other development tools. Seapine CM works with a variety of popular development tools, including Visual Studio, JBuilder, and Dreamweaver MX, through its MS SCC API support and customer interfaces. Administrator-definable triggers – programs you can create that run before or after file actions (e.g., check in, promote) - give you more control over your change management process and allow you to extend Seapine CM's functionality to fit your company's change and build management processes.

### Development is a global effort

Protect your intellectual property. Seapine CM's role-based security gives you precise control over who can access issues, files, and commands. Geographically dispersed teams will benefit from fast, reliable remote access to issue and source repositories with Seapine CM's secure 512-bit encrypted communications protocol. Strict password rules further ensure your valuable data is not compromised.

Streamline your game development efforts with Seapine CM and help your team deliver higher quality products on time.



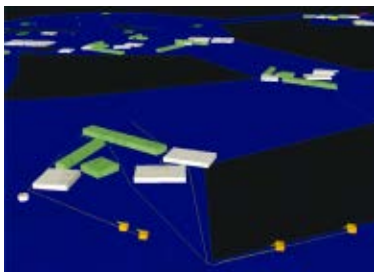
### Seapine Software, Inc.

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- Support for popular development IDEs
- Associate changes with defects and change requests
- Integrated intelligent 3-way diff/merge utility



**PathEngine**  
 40 rue de Cuire  
 Lyon 69004  
 France  
 Tel: +33 4.72.87.03.36  
[www.pathengine.com](http://www.pathengine.com)

**SELECTED FEATURES**

- Integrated collision architecture for fundamentally robust pathfinding.
- Sophisticated collision model accounts for agent shape and size.
- Supports arbitrarily overlapping ground surfaces.
- Supports dynamically placed obstacles and powerful mechanisms for dynamic obstacle management.
- Industrial strength solution - very fast queries, even over long distances.
- No manual waypoint placement or tweaking required.
- Extremely robust.
- Platform independant solution.
- Full source licence available.
- Extensive documentation, tutorials and examples.
- Comes with a graphical testbed and content tool integration.
- Very competitive licensing terms, excellent support.
- Low pressure evaluation with support provided during the evaluation.



**Intelligent agent movement for games**

Pathfinding is increasingly recognised as fundamental to the goal of creating more and more interesting game AI. Pathfinding is essentially about understanding the possibilities for movement in an agent's environment, and for most games, movement around the environment is central to the AI.

PathEngine is a sophisticated pathfinding solution based on an architecture evolved over many years of application in the industry, and over many successful projects. The architecture and techniques used by PathEngine have proven extremely effective and robust and provide a unique and powerful foundation for the development of complex and engaging movement-based AI.

At it's core PathEngine is built around an advanced collision model, based on agents moving over 3d ground surfaces. Agent shape is taken into account exactly (and automatically), so small agents can move through gaps that large agents cannot. Agent movement is through continuous space - there are no tiles - so aliasing effects at tile boundaries are completely eliminated. The ground may cross over itself arbitrarily to represent bridges, tunnels, dungeons, multi-level buildings and so on.

PathEngine supports dynamically placed obstacles. Dynamic obstacles are seamlessly integrated with the pathfinding collision model, and powerful 'collision context' mechanisms are provided for managing how dynamically placed obstacles apply to queries.

The collision model provides a strong paradigm throughout PathEngine's functionality and API. Queries are well defined with respect to the collision model and the results are easy to visualise. With PathEngine's dynamic obstacles and collision context mechanisms it's then straightforward to combine queries into powerful yet predictable movement-based behaviours.

On the content side, no need for manual generation or tweaking of waypoints or 'pathdata'. Once ground surfaces have been defined and obstacles placed content processing is completely automatic and the results guaranteed. World creators are freed from the responsibility for these kinds of menial tasks and the turnaround for content generation is increased. The robust approach used by PathEngine means content creators never need to modify content to workaround pathfinding problems and AI developers never need to tweak or rework code in late beta to workaround unexpected obstacles. PathEngine is extremely robust with respect to arbitrary configurations of obstacles.

Internally, PathEngine uses advanced computational geometry techniques (such as exact representation of intersection points and infinitesimal offsets to eliminate vertex special cases) to ensure robust operation and bring you optimisations that would not otherwise be possible. Fast queries are possible even in complex environments and over long distances.

Finally, quality of support is just as important as the quality of the solution. PathEngine is backed by many years experience providing pathfinding for games and making it all work together. Each licence comes with an excellent level of support.

**Praise for games using PathEngine:**

*"The pathfinding in this game is nothing short of astounding, and yet another aspect that is completely new to the MMORPG industry." - IGN*

*"The path finding is hands down one of the best I have ever seen. You simply click where you want to go and your character will go around trees, rocks, forts, hills and just about everything I could test it on." - EGCORE*

OMNI Interactive Audio



**Music • Sound Effects • Speech • Audio Integration**

Omni Interactive Audio includes the former sound department of Electronic Arts Seattle and veterans of the Seattle audio post-production and recording industry. Established in May 2002, the company provides a complete range of services that cover all aspects of audio for interactive media.

The team has shipped many major titles, including the original "Need for Speed" and four of its sequels, as well as "NHL Rivals" for Xbox and "Men of Valor" on PC and Xbox. The latter project included recording authentic weapons and vehicles of the Vietnam conflict, resulting in some of the best weapon sounds ever heard in a game. Stephen Wickes, VU Games Executive Producer says "In designing Men of Valor we recognized the importance of high quality sound design to accurately represent the drama and tensions of the Vietnam War. Omni Interactive Audio has exceeded all expectations in providing a perfect mix."

Current projects include the MMORPG "Guild Wars" being developed by ArenaNet and published by NCsoft. According to Jeff Strain, General Manager of ArenaNet, "The folks at Omni have a tremendous amount of industry experience, and it really shows. Guild Wars streams an enormous amount of content on-demand, so our sound effects need to be both high quality and very small in size. Omni was able to devise a layering scheme using our scripting tools to substantially reduce the total size of our sound footprint, while still maintaining best-in-class quality. They handle the entire chain of sound creation for us, from raw sound production, to actually integrating the sound into the game world. We are very happy with their contribution to Guild Wars."

Omni are team players and can provide support an in-house sound department, as they did recently did on "Halo 2", where they did audio post production on the in-game cinematics. The company also contributed sound effects for "SimCity 4" and "The Sims2". "They provide high quality content with the extras to make your life easy. They understand game needs and sound technology, deliver on time, and are very professional. They provided that extra support for our stressed in house team. What more do you need?" said Maxis Audio Director Robi Kauker.

A broad range of expertise, and many years together as a team create a synergy which allows Omni Interactive Audio to create a complete audio solution for any interactive project.. "I worked with these guys for ten years, and they consistently delivered great sounding games" says Hanno Lemke, Vice President/Executive Producer at Electronic Arts. "They always delivered on time, and were always willing to put in the extra effort at the end to add that final polish."

With hands-on experience on all modern platforms, including PC, Playstation2, Xbox, Gamecube, Web-based games, cell phones and PDA based platforms, you should have what Michael Waite, Vice President & Executive Studio Director, Amaze Entertainment says is "The best audio team I have ever worked with, in or out of house" working on your next project.



SCREENSHOT FROM GUILD WARS, A HIGHLY ANTICIPATED ONLINE PC GAME.

**Omni Interactive Audio**

2503 152nd Ave. NE, Bldg. #16  
Redmond, WA, 98052  
USA  
Phone: (425) 466-1594

[www.OmniInteractiveAudio.com](http://www.OmniInteractiveAudio.com)  
[info@OmniInteractiveAudio.com](mailto:info@OmniInteractiveAudio.com)

**SELECTED CREDITS**

- > Need for Speed: Hot Pursuit 2  
Electronic Arts  
Xbox, PS2, Gamecube, PC
- > Men of Valor  
VU Games  
Xbox, PC
- > NHL Rivals  
Microsoft  
Xbox
- > Halo 2  
Microsoft  
Xbox
- > SimCity4  
Electronic Arts  
PC
- > Warfare Incorporated  
Handmark  
Palm/Pocket PC
- > American Idol  
Metaplay  
Cell phones



**Affectworks LLC**  
5018 N. Illinois St.  
Indianapolis, IN 46208

[www.affectworks.com](http://www.affectworks.com)  
[info@affectworks.com](mailto:info@affectworks.com)

#### SELECTED FEATURES

- 20 years combined experience creating high end 3D assets.
- Dynamics, particles, rigging and animating, high and low poly characters.
- Experience creating art assets for games.
- Normal mapping.
- HDRI, LDRI, FG, GI and vector rendering.
- Texture creation. 2D mapped and procedurals.
- From concept art to finished model.
- Pricing options for any budget.
- Artists that understand game art.

# Affectworks

Affecting your imagination.

Affectworks is an Indianapolis based multimedia design firm with over 20 years of combined experience creating 3D art assets and digital media. Our artists strive to create the highest quality assets while maintaining a very competitive cost.

The founders of Affectworks maintain three core ideals in our business. We strive to tell great stories, using the latest collection of desktop publishing tools available, assist clients in sharing their vision with their customers and foster amazing ideas and top of the line designs in a relaxed atmosphere.

Affectworks will work with you collaboratively, using your 2D conceptual designs and transforming them into a perfect 3D realization. We can also work independently, delivering quality 3D content that fits both your game world and wallet. Our focus is on creating high-end 3D content that fits our clients' needs.

Currently Affectworks is assisting the School of New Media at IUPUI in combination with the IU School of Medicine to create a non-entertainment, learning game for the IU School of Medicine. We are working with the students of New Media, acting as consultants, aiding them to create art assets for the Unreal Engine, and teaching them how to create low poly models, texture art and animations efficiently and quickly. This continued contact with the University insures that fresh thinking and innovative ideas are always being presented, a huge benefit for our clients.

Take a look at what Affectworks can do for your company. We have several examples available for viewing ranging from low poly characters to high-end nurbs models. If you are looking for something specific, don't hesitate to contact us. From crates to creatures, Affectworks has the experience to see your vision realized on time and on budget.

Contact us today to find out how Affectworks can assist your company in asset creation and cinematic production.





## ABOUT NEW PENCIL

Since its formation in 1997, New Pencil has made a name for itself as a premiere developer of art for video games. New Pencil has contributed to more than twenty original titles and has provided over 85% of the art content for the number one best selling franchise in the industry, The Sims™ series, from EA / Maxis.

New Pencil has quickly developed into a company defined by work of the highest quality and unsurpassed professionalism. Building upon an extensive background in the video game industry, New Pencil has specifically tailored its production processes to provide video game developers with the art content they demand. The result: strong partnerships with the industry's leaders.

### THE NEW PENCIL MISSION

Provide an outsourcing solution that integrates seamlessly with the client's internal production team without compromising the integrity of the project.

### NEW PENCIL'S SERVICES

- Creative services and concepting
- Print ad design and execution
- Real-time props and environments
- Texture creation
- High resolution 3d models and normal maps
- High resolution cut scenes, promo's and commercials
- Art / technology integration

### CREATIVE SERVICES

New Pencil offers developers a full range of preproduction services. Successfully managed projects demand a clear and consistent artistic direction, typically established by a wealth of concept designs. At New Pencil, we provide traditional and digitally created designs to expand upon the scope of an existing project within a set style, or to assist in establishing the artistic direction of a project from its inception.

### REAL-TIME 3D MODEL AND TEXTURE CREATION

As the Video Game industry matures, the quality of real-time 3d graphics is constantly improving. Combining a mastery of today's powerful 3d software with the understanding of what makes real-time assets efficient; New Pencil's artists can provide characters, creatures, objects, and environments of the highest quality for any production.

### HIGH RESOLUTION 3D MODEL AND TEXTURE CREATION

In contrast to real-time 3D assets, pre-rendered, high resolution content allows artists to create stunning images using any and all of the tools and techniques at their command. New Pencil's staff of traditionally and technically trained artists has provided elaborate environments, architecture, characters, creatures, and objects for multiple titles.

### ANIMATION CUT SCENES AND COMMERCIALS

The amount of animation that is required by current video games can be staggering. From in-game character animations to extensive cut scenes and commercial footage, New Pencil can either assist an internal team, or act as a complete production solution while adhering to stringent budget and time constraints.

### ART AND TECHNOLOGY INTEGRATION

At New Pencil we understand that each production has its own unique set of technical requirements regarding both asset creation and implementation. Our extensive experience working with a wide variety of game engines, development tools, and 3D applications insures that our artwork will be of the highest quality both aesthetically and in terms of its ease of implementation.



### New Pencil, Inc.

80 Liberty Ship Way, Suite 6  
Sausalito, CA 94965  
Phone: 415.339.1800  
Fax: 415.339.1803

<http://www.newpencil.com>  
info@newpencil.com

### PARTIAL CREDIT LIST

- Agent under Fire
- Golden Eye
- URBZ
- Mythica
- Zoo Tycoon 2 E3 2004 trailer
- Myth 3: The Wolf Age
- The Sims 2 E3 2003 trailer
- The Sims 2 E3 2004 trailer
- Tiger Woods PGA Tour 2004 Commercial
- Magic the Gathering: Battlegrounds
- True Crime: Streets of LA
- The Sims
- The Sims 2
- The Sims Deluxe Edition
- The Sims "Livin' Large"
- The Sims "House Party"
- The Sims "Hot Date"
- The Sims "On Vacation"
- The Sims "Unleashed"
- The Sims "Superstar"
- The Sims Online
- Sim City 4

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## Facial Animation Tools and SDK

OC3 Entertainment provides facial animation middleware solutions that use audio dialog to generate highly realistic animation data for lip synchronization and speech gestures. The solutions consist of the following components:

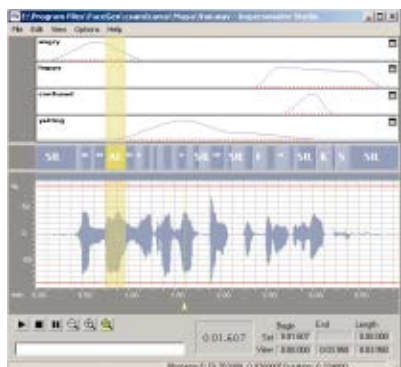
**Impersonator Studio** – Batch process hundreds of audio files at once with this powerful tool, or perfect a single animation. Level designers can modify phoneme times for perfect lip synchronization or add expression tracks to give characters more emotion.

**Impersonator SDK** – The Impersonator SDK can store, play, and blend morph and bones-based facial animations at runtime on the PC and consoles. The SDK is available fully integrated with Unreal, RenderWare, and Gamebryo. Other game engines can use the C++ API to create a memory and processor efficient solution. The Impersonator SDK can generate animations from audio files programmatically, so developers can easily integrate the system into their toolset for a smooth pipeline or mod developer use.

**Animation Tools** – Use the Impersonator animation tools to set up bone poses for your character or play morph or bones based animations in 3D Studio Max or Maya.

**Real-time Analysis** - Games and applications can take advantage of real-time audio analysis for in-game communication. Lip synchronization and speech gesture tracks are generated on the fly using audio from a microphone. After a configurable latency (about 200 ms), the animation can be streamed with the delayed audio and played in synch on the receiving client.

For an evaluation of the tools and technology, please contact [info@oc3ent.com](mailto:info@oc3ent.com).



### OC3 Entertainment, Inc.

1133 Winter Walk Cir  
Morrisville, NC 27560  
Phone: (919) 460-4564  
Fax: (919) 460-8993

[www.oc3ent.com](http://www.oc3ent.com)  
[info@oc3ent.com](mailto:info@oc3ent.com)

### SELECTED FEATURES

- Speaker and language independent
- Generate head rotation and eyebrow movements
- Available integrated with Unreal, RenderWare, and Gamebryo
- Tweak animations with Impersonator Studio
- Batch process animations
- Memory efficient animation data
- Supports bones and morph targets
- Support team dedicated to the success of your title
- Solutions for pre-recorded dialog or in-game communication

*"When creating the lip sync data for Karaoke Revolution, OC3 Entertainment's tools and technology were a huge help. We were able to quickly and easily create the foundation to animate our singer characters for each song within the game. OC3 Entertainment was very responsive to our needs and extremely helpful on this project."*

**Mike McHale**  
Producer  
Konami

*"We're excited to be able to offer Impersonator as part of the Unreal Tournament 2004 editor toolset, and we're really looking forward to seeing what our modification community will do with this technology."*

**Michael Capps**  
President  
Epic Games



## electronic game show

Latin America is composed by a large population of kids, young and adult people which find in videogames one of the best entertainment possibilities.

In Mexico, videogames represent a \$400 million dollar market, made up by console sales, accessories and software, which are distributed through various dealers, retailers and wholesalers. There are about 8 million videogamers in the country and 12 million Internet active users (AMIPCI). Mexico is the first country from Latin America which has official presence of the three main videogame consoles.

Brazil in the other hand, is the biggest market for fairs and expositions in LA (ABRAFE); and is well known that the country has the strongest technology and game culture in Latin America. In 2003, there were 8 million Internet house-holds, 1.1 million broadband subscribers, 50 million phone lines, 45.5 million cellular phones and 10.1 million cable TV subscribers (Anatel). There are 19 million PCs sold, 3 million only in 2003 (IDC) and around 600,000 next-generation consoles (Xbox, GameCube and PS2) and 1.4 million PSOne already sold.

Given the explosive growth in this industry, the mexican company Oelli created in 2002 the Electronic Game Show (EGS), the only major expo for videogames and digital entertainment for the Latin America's region, which will bring in 2004 within both countries, over 60,000 gamers, parents and visitors into one place 100% dedicated to videogames, providing an ideal venue to meet publishers, developers, dealers, sponsors and manufacturers.

### The Electronic Game Show is divided into 3 main activities:

- > Exhibition Area: where the most important companies in the world of videogames showcase the latest technology and product launches.
- > Tournaments: Over 8,000 gamers will compete for awesome prizes in series of tournaments operated by Latingamer, the leading videogame league in the region.
- > Business Day: A special time slot created to foster the contact between publishers, developers, distributors, console manufacturers and retail.

### EGS 2003 Facts

The Electronic Game Show 2003 in Mexico City was a total success: 4 days of show, 27,011 visitors, 52 exhibitors in which 12 were global videogame companies. There were 6 official tournaments with 4,129 participants, 77,500 sq. ft. of exhibit floor and 48 media companies covering the show.

### EGS 2004

The 3rd Edition of the Electronic Game Show in Mexico and will grow in space and activities; now with the first show taking place in Brazil, the EGS will consolidate itself as the most important event of the videogame industry in Latin America.

### Marketing

With an investment in massive media of approximately \$550,000 US dollars in Mexico and about \$400,000 US dollars in Brazil, we are developing a very balanced marketing campaign, allowing us to impact the videogame user within an age target of 7 to 34 years old.

### Turn-key Solutions (Foreign Exhibitors)

Oelli offers to those interested in participate in the EGS 2004 for Mexico and/or Brazil a set of Turn-key solutions, made possible through an alliance with several different service providers, such as:

- > Freight forwarding and customs brokerage
- > Booth design and manufacturing
- > Hiring and managing of personnel and promotion
- > Public Relations Agency
- > Travel Agency



### Electronic Game Show

Providencia #930

Colonia del Valle 03200 México, DF MEXICO

Phone: +52 (55) 11078214 al 16

Fax: 11078217

[www.electronicgameshow.com](http://www.electronicgameshow.com)

[info@electronicgameshow.com](mailto:info@electronicgameshow.com)

### INFORMATION

#### Electronic Game Show 2004 – Mexico City

**Dates:** October 21st to 24th, 2004

**Place:** World Trade Center, Mexico City

**Floor Space:** 105,000 sq. ft.

**Expected visitors:** 30,000

#### Activities:

- > October 21st as exclusive Business Day
- > 10 Tournaments in all platforms (XBOX, GC, PS2 and PC)
- > Press and Media Center
- > Business Center
- > EGS Party Cocktail

#### Electronic Game Show 2004 – Brazil

**Dates:** November 19th to 21st, 2004

**Place:** World Trade Center, Mexico City

**Floor Space:** 88,000 sq. ft.

**Expected visitors:** 30,000

#### Activities:

- > November 19th as exclusive Business Day
- > 12 Tournaments in all platforms (XBOX, GC, GBA, PS2 and PC)
- > Press and Media Center
- > Business Center
- > EGS Party Cocktail

WWW.GDMA.G.COM 49



**dSonic**

Vincent Stefanelli  
110 Pacific Ave Mall, Ste 213  
San Francisco CA 94111  
(814) 873-5840

[www.dsonic.com](http://www.dsonic.com)  
Vincent@dsonic.com



**Music • Sound Effects Design • Voice Over**

**Audio for Games is Our Thing** - whether we're creating music, sound FX or dialog we're constantly asking ourselves what will work best in a game.

As avid gamers, we have a sense of what works and what doesn't. We go to great efforts to make the sound FX and music as impactful as your visuals by seamlessly integrating music and SFX to create a total soundscape for your game.

dSonic creates these soundscapes with the player in mind - sound effects enhance the physical environment and music provides the emotional impact. Sound design at dSonic is about making something unique, not just pulling sounds from sound effect CDs. We listen to your objectives, adhere to your artistic vision and leverage technology to provide the finest sound effects to complement your vision.

dSonic understands your technical issues. We work with your team to develop your sound engines and delivery mechanisms. We tailor our design technique to your technology and we utilize the latest tools such as ISACT and the Kyma system to create the most effective audio for your system.

This technology is balanced with our creative approach and because of our classical backgrounds, orchestral soundtracks are par for the course. At the same time we can create rock, electronica, funk or any other style you desire. If you prefer, we also provide licensed music.

To round out a full menu of audio services, dSonic has a cadre of professional actors and the experience to effectively direct your Voice Over session to provide the best dialog available.

*"Sound: 10 out of 10—the voice acting, music, and sound effects are splendidly incorporated into Neverwinter Nights - Shadows of Undrentide"*  
gamebanshee.com

**The dSonic Story**

The three founders, Vincent Stefanelli and the Amarasingham boys - Kemal and Simon all come from a strong musical background. Kemal was a professional violinist playing in various Boston orchestras before joining Looking Glass Studios in 1994. He worked on games such as Thief 1 & 2, the Flight Unlimited series and System Shock 2 garnering 2 IDSA Nominations, 2 GDC Nominations and awards from PC Gamer and Computer Gaming Magazines.

Kemal raised the idea of a partnership with his brother Simon, who had played in several rock bands and had spent 12 years as a professional composer. He worked on a wide range of projects including PC games, Kellogg's commercials, A&E Investigative Reports and corporate events for the likes of Novell.

Simon had recently met Vincent, at that time Director of Marketing for Monarch Records, and Simon was impressed by his practical approach to business. Having started out as a professional guitarist, Vincent had worked in the Film/TV World and acquired a sharp acumen for business and production (he had been responsible for deals such as connecting Harley Davidson with the makers of the Michael Douglas film, Black Rain).

In 2000, the three decided to form a company to concentrate on the industry with the most exciting opportunities for creative and technical challenges – the Game Industry - and dSonic was born.

**SELECTED FEATURES**

*"dSonic is simply the best independent sound group we have worked with. They craft and specialize sound effects that really give our games that extra impact."*

**Todd Howard/Exec. Producer  
Bethesda Softworks,  
[www.elderscrolls.com](http://www.elderscrolls.com)**

*"dSonic's work [on Gladiator, Sword of Vengeance] was stellar. We were on a tight deadline and they produced tracks quickly...and hit it the first try."*

**Rick Fox, Audio Director/Acclaim**

*"At least half, though maybe more, of the creepiness of System Shock 2 is achieved through the sound design of the game. To put it bluntly-the sound is phenomenal."*  
**[gamesfirst.com](http://gamesfirst.com)**

➤ **Clients Include:** Acclaim, Activision, Arkane Studios, Atari, Bioware, Bethesda Softworks, Blue Fang Games, Blue Shift, Centerscore, EA, Eidos Interactive, Fishtank Interactive, Floodgate Entertainment, JoWood, Leapfrog, Microsoft, Motorola, Mumbo Jumbo, Nintendo, Sony, United Developers, ZIO

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**SR GAME DESIGNER**  
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**SR SOFTWARE ENGINEER - AI**  
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**SR SOFTWARE ENGINEER - GAMECUBE**  
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**SR 3D CHARACTER ARTIST**  
**SR 3D ARTIST**  
**SR ANIMATOR**

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We provide all necessary travel and visa documentation and services.

**Ubisoft Shanghai Studio**

- Since June 1997, we've produced over 20 games on nearly every platform.
- Games developed for Ubisoft's leading franchises, including Ghost Recon, Splinter Cell, Rainbow Six, Rayman, and more.
- Over 270 talents and growing.
- Now working on next generation consoles: next Splinter Cell and creating a new brand for Ubisoft.

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## PIXEL PUSHER

CONTINUED FROM PG 33

however, if you're going to be filling the map automatically with a normal caster, you can enjoy the even texture density of an automap without worrying how to paint it by hand.

The high-resolution source models, on the other hand, will be mapped in conventional ways. Indeed, efficiency won't be as much of a concern because the resolution of the source texture won't have any effect on the resolution of the final game texture, so you can be as messy as your texture painters will let you.

## EMBRACE THE DULLNESS

Make no mistake, normal mapping is a watershed technology for texture painters. A normal-mapped surface will light every bit as well as the finely detailed geometry from which it comes. This means all the skills that used to go into creating the appearance of geometric complexity are no longer required. Once we had to carefully shade our textures to create the appearance of wrinkles, draperies, rivets, and paneling. Those kinds of details are now going to be created from actual geometry in the high-resolution source model. All the painstaking trompe l'oeil is not only

**FIGURE 5** The low polygon silhouettes of these DOOM characters make an odd contrast with the nicely shaded interiors.

unnecessary, but continuing to add false shading is going to undermine the better shading the new technology offers. False highlighting and shadows will look as unnatural as the makeup on a cast member in *Cats* as soon as your character animates.

Removing the shade information from textures means source art for normal-mapped models often looks depressingly dreary. If you have a hard time divorcing yourself from fake shading, you may find you can still give subtle clues to the form of your objects using slight changes in hue and saturation rather than the changes in value. Even with normal mapping, your model still won't light photo-realistically because most games don't support any form of global illumination or radiosity, so a little cheating is often needed to suggest those effects. Finding the right distribution of duties between yourself and the renderer will require some trial and error. Just be sure to run tests with the real in-game lighting and with a moving character, for example. Many



cheats that seem elegantly understated in a still shot are painfully obvious under changing lighting conditions.

Normal mapping is going to change a lot of our daily lives as it filters into the mainstream game technology toolkit. Unlearning a lot of our painfully acquired skills won't be easy. The only consolation is that there are going to be a lot of new skills to master, and of course that the final results are going to look infinitely better. Don't be afraid—stand up and look DOOM in the face. ❖

## THE ART OF THE GAME DEAL

CONTINUED FROM PG 22

and there's never enough time. But what I will say is that when Jeff Fiske and I were deciding, choosing which publisher we were going to go with, out of all those that had expressed interest, there's a lot of focus on royalties, and what's the business side, and blah blah blah. I don't want there to be a misunderstanding there. Our business deal with Myelin is excellent. But the thing that Jeff and I came down to is, we said, "Which environment is going to allow us to make the best game?" And that's one of those things you don't always think about when you're setting up the business deal. But we had been working independently for two years and looked back and said, "If we were working with a big publisher, applying a lot of oversight to us, I don't think we could have made this game," because we had to make some big changes half-way through and it would have been difficult to explain to someone who wasn't part of the process. We have been making games for 10 years, we know how to do it, and when it came right down to them, we were looking at Myelin and some other people, we said, "We're going to be able to make a really good game with these people—they're not going to get in our way." That's the promise Gene made, and he's absolutely kept that promise, a thousand percent. He has let us do what we know how to do. All that other stuff, the marketing, the PR, that's all the same headaches, they haven't figured out how to make that any easier than anyone else. But the game development, I have to give them credit for that.

**JM:** How did you balance the risk of going with a first-time, unproven publisher?

**CB:** Absolutely! I said that to Gene from the moment we first met about this. I said, "You guys have never done this before, and I cannot tell you how many people I have seen come into this industry and they either trivialize what it is, they think it's fun and games, or they look down on it, they say, 'I'm a senior marketing executive from Kraft with 15 years' experience, I'm going to show you how marketing really works!' And then they meet the gaming community, which is really well educated and intelligent, and knows the product—the typical marketing thing just doesn't work." So I've seen this, and people say, "Yeah, yeah, yeah." The pace is very different.

So I laid this all out to Gene. There's nothing they said that gave me any more confidence. There was definitely a risk. But again, Jeff and I said, "We're going to make the best game with these guys." That is ultimately what we need to defend. I have seen good games fall apart because of bad management, and I've seen bad games get funded all the way to completion and no one knows that they're bad games, just from mismanagement from the producer's side. We just felt like we were going to make a great game. If Myelin screws up and it doesn't get marketed right, that's the position we'd rather be in. And that's not just some falling on sword thing, because the fact is, in this business, if you make a good game, then you'll get

some pretty good sales. Maybe Myelin wouldn't be able to move two million units worldwide on day one, or something like that, but I would much rather move a quarter of that amount and have it be a great game. There's much more risk from it all falling apart if the game doesn't come out right. That sounds kind of condescending, so it's not to say that their job is easy, but even if they do half as good as your typical publisher, that's fine. [Laughter.] That was our attitude. That sounds insulting, but really, you've got to look at the other half of Myelin's philosophy, which is empowering developers. So it doesn't take a rocket scientist to say that they have not established a track record in marketing yet. They've never done it, fine. But the opportunity Gene has figured out is that there's a lot of developers out there like us who have done this a while. They're reliable, there's a lot of money to be made in PC games specifically, and if you could just get the egos and the overhead out of the way, this will probably have a much more functional relationship. And to his credit, that's what he's done.

**JM:** What games are you playing now?

**CB:** CHILDREN OF THE NILE!, ZOO TYCOON, ROLLERCOASTER, and some of the older city-builder games. ❖

**Note:** An extended version of these interviews will appear on *Gamasutra.com* on October 8, with additional discussion on the future of publishing.



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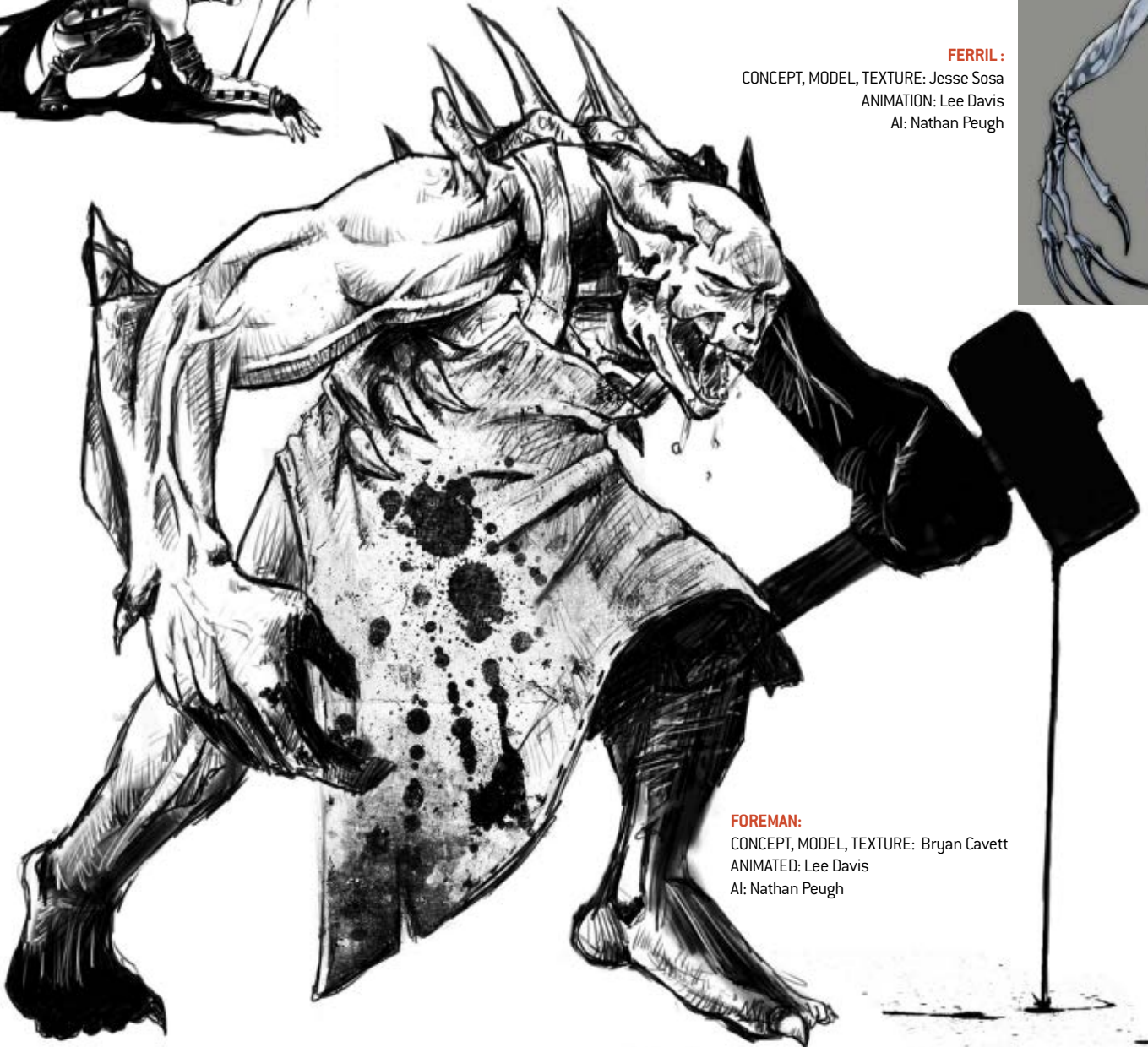
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