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JUNE/JULY 2005

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THE LEADING GAME INDUSTRY MAGAZINE

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DEVELOPMENT STUDIOS, POST-ACQUISITION

LICENSE TO PLAY?
DEAD PRESIDENTS, GAME ADAPTATIONS

E3 HIGHLIGHTS
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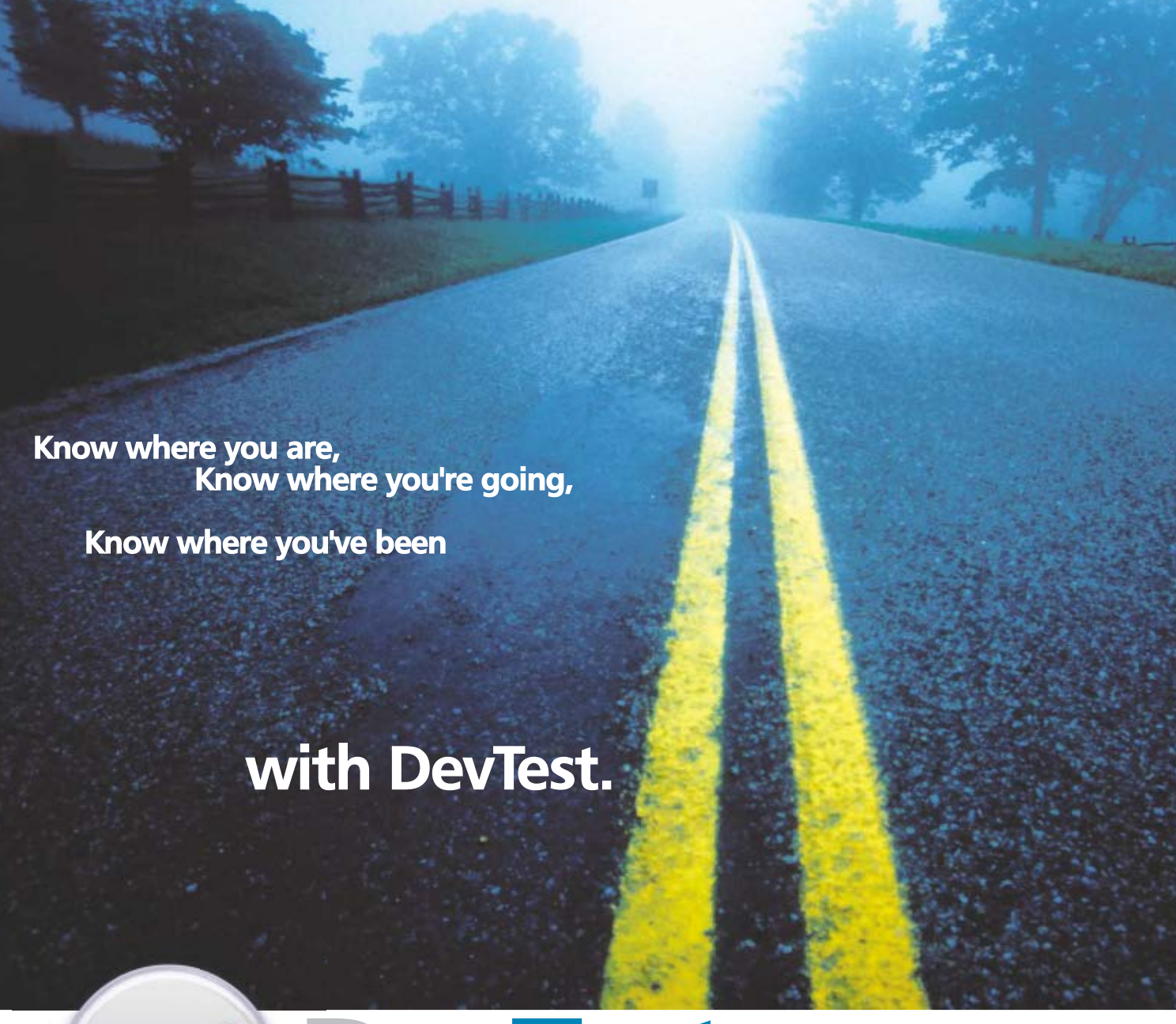

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VOLUME 12, NUMBER 6

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When a publisher acquires a development studio or studios, it must decide how the acquisition will play out in terms of practical considerations. Will the studio remain fairly autonomous and in its home city, or will the publisher assemble the employees into a more centralized office? Other approaches—such as streamlining only meta-processes, like payroll, benefits, and tech support—are also available. What does a studio's stance mean for you?

By Paul Hyman

17 PLAYING SMART WITH IP

The quandary of whether to create original intellectual property or use licensed characters or settings for a game is, at this point, fairly well-discussed. But how closely have the potential pitfalls of licensing, which is generally considered to be a 'safer bet', been examined, or the greater effort required to popularize original IP? With specific input from both licensors and publishers, we look at the state of licensing as the next hardware generation rapidly approaches.

By Dan Lee Rogers

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STUDIO POSTMORTEM

24 A COLLECTIVE BACKBONE: FOUNDATION 9'S DEVELOPMENT DREAM

When Backbone Entertainment and The Collective joined forces, they created the largest independent developer in North America, Foundation 9, with about 400 employees under its care. How did this developer conglomerate form, and what did the founders learn from the trials and tribulations of the original companies that they founded? In a twin version of the traditional what-went-right, what-went-wrong format, *Game Developer* presents this special studio postmortem.

By Andrew Ayre, Douglas Hare, and Jon Goldman

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COVER ART: TED NAIFEH FOR FOUNDATION 9

NOBODY BEATS THE BIZ

WELCOME TO THE FIRST ANNUAL BUSINESS ISSUE of *Game Developer*, the opening salvo in a series of specially themed issues readable by and applicable to all game professionals, regardless of discipline. Even if you're not directly involved in the day-to-day business dealings of your company, you do care about whether your company works on licensed games, and just how development studios interact with the publishers that own them. Fortunately, so do we.

A SCYTHING TEAM-UP?

Our postmortem for this month (p. 24) sidesteps convention, to dissect not a particular game, but rather, a particular developer—or better yet, a pair of prominent, now-merged companies: Backbone Entertainment (DEATH JR.) and The Collective (STAR WARS EPISODE III: REVENGE OF THE SITH). Operating together as Foundation 9 Entertainment, the company is now the largest independent developer in North America. We asked senior figures from the former companies to discuss both the high and low points of their respective development firms, and exactly why they got together. Oh, and it doesn't hurt that we got Backbone's Death Jr. and his friends into the boardroom, Trump-style, for the cover image.

STUH STUH STUDIO!

With significant development studio consolidation over the last couple of years, larger independent developers like Foundation 9 are becoming a veritable rarity. Many of the most notable North American developers are now owned by one of the big publishers. But what happens post-acquisition? What are the relative advantages and disadvantages of bureaucratic and technical independence from your owners, compared to greater consolidation? Reporter Paul Hyman talked to acquired studios and senior executives alike at major companies such as THQ, Activision, Electronic Arts, and Ubisoft (p. 10), documenting the contrasting ways that the studio system can operate to keep game quality high and employees happy, even when your developer becomes one of many.

IP EFFUSIVELY

In our final major feature for the issue, Dan Lee Rogers uses both sales data and real-world financial estimates to examine the position of different games created using original and licensed intellectual property in today's market (p. 17). Although some of the traditional touchstones for this quandary are obvious, Rogers talks to publishers about their strategy and analyzes the increasing licensing fees for non-game IP, pointing out where, why, and how publishers should license for a balanced portfolio.

BUSINESS AS USUAL

We haven't forgotten our regular contributors for this themed issue, and you can still find our Inner Product, Pixel Pusher, Aural Fixation, and Game Shui columns nestled happily in the issue, as well as the regular Skunk Works product review section and a particularly business-relevant Thousand Words art showcase, thanks to Capcom's crusading lawyer PHOENIX WRIGHT.

In addition, and thanks to popular demand, we'll be commissioning more and larger technical articles for the magazine, and notably stepping up code-oriented articles on sister website Gamasutra.com to satisfy recent interest.

E3'S LOVELY PLUMAGE

As I write this, I'm sitting in LAX waiting to return from this year's Electronic Entertainment Expo, and, appositely, the music playing over the loudspeaker is Fleetwood Mac: "Tell me lies, tell me sweet little lies."

Fortunately, and aside from press conference obfuscations, we can most easily get to the bottom of each console's relative technical strengths when we can compare launch titles. (Besides, isn't it all about the games, not the power of the console?)

Separately, and following last year's post-show tradition, we *Game Developer* editors have picked our favorite games and trends, from OKAMI to HELLGATE: LONDON through SHADOW OF THE COLOSSUS, in an E3-centric Heads Up Display (p. 4).

What we didn't mention in HUD was our most disturbing E3 experience, which came about when SpongeBob SquarePants' nose became wedged in the door as he tried to sidle backstage at the THQ booth. We can handle the post-apocalyptic fire-eaters and battalions of Roman centurions, but please-don't maim our spongiform idols.

S!

Simon Carless, editor

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(precisely calculated while your battle rages in the foreground)

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PS3, XBOX 360, REVOLUTION ANNOUNCED

THE NEXT GENERATION CONSOLE BATTLE IS WELL underway, at least in terms of PR, with all three major hardware manufacturers announcing consoles in the period around the 2005 E3 Expo.

Microsoft's Xbox 360 was actually unveiled a week before E3, taking a pre-emptive strike with a special show on MTV. The console, which uses a three-core PowerPC-based CPU, with each core running at 3.2 GHz, was the only new hardware that was playable on the show floor, albeit in reportedly alpha form. The Xbox 360 should also be the first console to launch, and the only one slated to hit consumer shelves within the year. As a quirky sidenote, the 360 will feature a Jeff Minter-created visualization program for audio playback—the hirsute UK game designer contributed similar, but less sophisticated software for both Atari's Jaguar, and VM Labs' Nuon consoles.

Sony stole some of the media limelight with its impressive PlayStation 3 demos, many of which may have been CG renderings of what Sony promised would be possible on the new hardware, which claims 2.18 teraflops of computing power on a single 3.2 GHz chip. With the lines between CG and realtime graphics becoming increasingly blurred, these impressive trailers may not have been too far from the mark. Sony seems keen to go forward in its quest to capture the entire living room, promising that the PS3 will have computer and entertainment media capabilities, using Sony's new proprietary Blu-ray discs.

Nintendo seemed notably mysterious in its new console announcement, hinting at a more modest graphical increase over the GameCube, choosing instead to target those developers that cannot afford the huge budget leap that many report will be required for Xbox 360 and PS3 development. The biggest announcement was full availability for the entire Nintendo first-party console lineup, from the NES (via online downloads) on through to the Gamecube (via backward compatibility).

Across all of the new consoles, wireless and multiplayer were the key words. Microsoft will be going forward with its Live service, signing on MMORPG Final Fantasy XI as a flagship title for the new iteration. The PlayStation 3 will also have Ethernet network access, and Nintendo's Revolution will have a LAN port for downloading games. All three console makers announced that wireless controllers would be standard for their new systems, with optional tethered controllers for the 360 and PS3. Backward compatibility was also vital, with software from Sony's three consoles being playable on the PS3, alongside Nintendo's legacy announcement, and Microsoft's 'selected' backward compatibility for Xbox titles.

— Brandon Sheffield

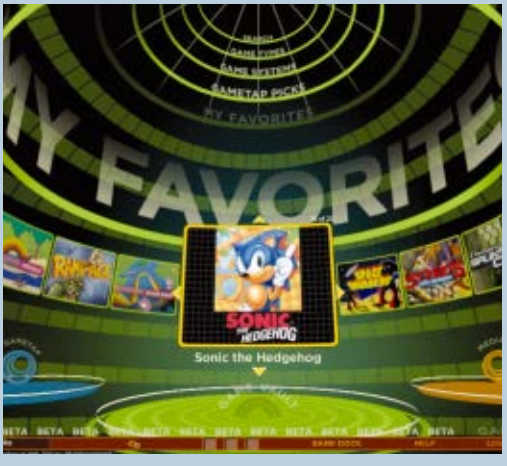
GAMETAP FEEDS GAMING 'LONG TAIL'

TURNER BROADCASTING System Inc. has announced an initial list of licensees for its GameTap "broadband entertainment network," a PC-based digital subscription service that will launch this fall, and allows subscribers to play hundreds of classic arcade and console games in an all-you-can-eat business model for a fixed monthly fee.

The specific list of initially announced licensees includes Activision, Atari, Intellivision Lives, Midway, Namco, Sega, and Taito for emulated systems including arcade hardware, Atari 2600, Intellivision, Sega Genesis, Saturn and Dreamcast.

Turner's project also has significant implications for game preservation and the 'long tail' for games, a Wired Magazine-originating concept for art that has low demand, low availability, but commercial potential. Turner's Dennis Quinn commented that, for the gaming industry, GameTap fills the need for a viable post-retail sales channel. "Games—even great ones—have had a much shorter lifespan [than other media]," he said. "We are [launching GameTap to give] the kind of longevity to gaming titles now enjoyed by movies, songs and books."

—Simon Carless



E3: BEST IN SHOW

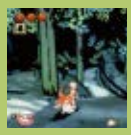
EDITOR SIMON CARLESS'S PICKS

Shadow Of The Colossus (Sony, PlayStation 2)
Being the spiritual successor to beloved art-game ICO, and involving some truly unique-looking behemoth-clambering gameplay, this looks like a stand-out PS2 game for the holiday season.

Hellgate: London (Namco, PC)
Flagship's first title is both a first-person shooter and a Diablo-style RPG, including entirely randomized levels, frag-happy gameplay, and online co-operative play—original thinking in action.

L.A. Rush (Midway, PlayStation 2 and Xbox)
A very guilty pleasure at the show, L.A. Rush pairs Burnout-style crash modeling and Need For Speed Underground-style street racing in entirely obvious but entirely fun style.

MANAGING EDITOR JILL DUFFY'S PICKS

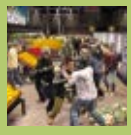


Okami (Capcom, PlayStation 2)
Like wet paint ebbing and flowing on a canvas, Okami—the so-called nature adventure game with a wolf for its main character—stands out as E3's prettiest game.

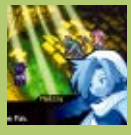
Fatal Frame III: The Tormented (Tecmo, PlayStation 2)
A trailer, though no playable game demos, confirmed Tecmo's third addition to the Fatal Frame series, the creepy-can-be-beautiful saga of young women making sense of a twisted world through a camera lens.

ASSISTANT EDITOR BRANDON SHEFFIELD'S PICKS

Castlevania: Dawn of Sorrow (Konami, Nintendo DS)
The latest in the series is producer Igarashi's biggest attempt to get a younger audience interested in 2D gameplay, according to the man himself, who considers the DS the last bastion of 2D.



Dead Rising (Capcom, Xbox 360)
Though only shown on video, this new Keiji Inafune (Megaman, Onimusha) game won me over with its scads of zombies, humorous style, and unique character design. Extra points to any game that allows me to cover a zombie's head with a bucket.



Riviera: The Promised Land (Atlus, Game Boy Advance)
This Bandai Wonderswan update blends RPG, dating simulation, adventure and rhythm game genres into a seamless hybrid—more than just another RPG in a crowded market.

PS3, XBOX 360 MIDDLEWARE SHOWCASED

IN THE HEAD-TO-HEAD BATTLE FOR GAME console victory, and months before the machines will even be on the market, Sony and Microsoft are already thigh-deep into their campaigns. But how each company's middleware announcements are targeted to developers is as important as how the consoles themselves are targeted to consumers.

Two months before Microsoft officially unveiled the Xbox 360 at E3, the company used the month of March—and a podium at the Game Developers Conference, where thousands of specifically product- and development-conscious people gathered—to announce XNA Studio and lift an embargo on Xbox 360 middleware supporters, allowing about a dozen companies to come forward with the news that their products would indeed support next-generation Xbox game-making: Ageia (Novodex), Alias (Maya), Autodesk (3D Studio Max), Avid (Softimage), Creative Labs, Epic (Unreal Engine), GameCODA, Havok, NDL (Gamebryo), Perforce, SpeedTreeRT, and Virtools.

Sony lifted its middleware embargo in May alongside the first showcasing of the PlayStation 3, perhaps meaning that the announcements got a little lost in the rush of consumer press. Nevertheless, Epic, NDL, Metrowerks (CodeWarrior), Autodesk, and Ageia Technologies' Novodex proudly count themselves among the list of PlayStation 3 game development supporters, and more supporters will likely be announced in the very near future.

In the end, the number of vendors to actually support development is likely not going to be much different between the two game figureheads—simply, the consoles are too important not to support. And while the hardware will play major importance in the success of each company, the corresponding games—and hence, the tools used to make them—will always be the wizard behind the curtain.

—Jill Duffy

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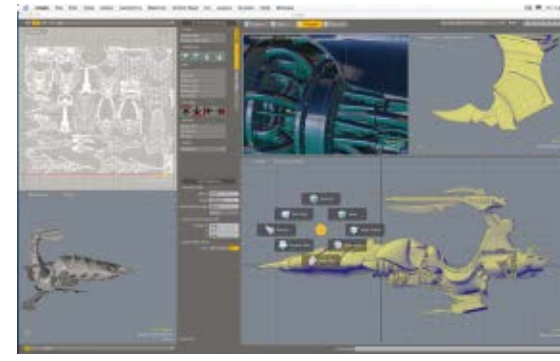
LUXOLOGY'S MODO 102

BY DAVID MARCH



Modo's modeling tool is the new kid on the 3D creation block.

WHENEVER I FIRST OPEN A NEW software package, before looking at any of the documentation, I always play around with it to see if I can figure out how to use it without having someone spoon-feed me its functions. Luxology's modo 102 is an application I felt completely at ease with from the start.

Modo is a 3D polygonal and subdivision surface modeling tool. Most experienced 3D artists will find it fairly intuitive to use, as its core functions resemble other 3D art packages' pretty consistently; for example, the setup options in modo allow for some basic Maya default keys.

When I first opened the package to fiddle with it, I immediately clicked on the box icon and created a simple box model. I then hit the W, E, and R keys for translation, rotation, and scale, and immediately navigated with my mouse a la Maya's default mouse and key movements. In a final test, I randomly hit the 1, 2, 3, and 4 keys. Now I felt like I was using 3DS Max's default quick keys in the sub-object mode for vertex, faces, and edges, and so on. Additionally, the menu options and layout make for a highly customizable and user-friendly interface.

TUTORIALS MAKE THE MODEL

After noodling with modo blindly for a bit, I eventually shifted gears and cruised through the help options to see what additional functionality the modeling program has to offer. The .avi tutorials in the documentation folder, which were great and easy to follow, covered everything from navigation and layout to the tools' functions. I also found some extra modeling tutorials on making a screw with script usage and a head modeling tutorial on Luxology's web site, all of which help artists get up to speed quickly and efficiently. What's especially nice about the lessons and demos is 1) you can find and view them quickly (we are, after all, in the digital age), and 2) video tutorials work extremely well for most artists, who tend to be visual learners.

You would think that usability—what a product vendor does to make learning its software as easy as possible—would be a key element in the success of the product. It sounds pretty rudimentary, but many software packages are lacking in this area. To find a new tool that's easy to use on a dry-run and has well-documented tutorials both built-in and on its company's web site is both practical and optimal for the user. Luxology's insistence on making modo straightforward to learn and use is marked by clear follow-through of this sort.

Upon installing modo, you have the option to use some basic Maya setups, as I previously mentioned. Additionally, LightWave users will find the sub-division surface (SDS) modeling akin to their 3D package of choice: modo was created by many of the original LightWave developers. This crowd in particular, I think, will climb aboard the Luxology train, as they'll find most of their features—along with some new ones—incorporated into modo.

MODEL UP

Modo makes it easy to select faces. You just simply have to hold your left mouse button down and start dragging over the faces you want to select. You can also Lasso select or change your style to rectangle, circle, or ellipse like other 3D packages. I enjoy the feature of dragging your mouse across the screen over adjacent faces to select them. You can also deselect and add none adjacent by holding down the shift key. Additionally, modo's ability to remember selections while also quickly being able to convert from polys, verts, and the like is efficient. Default keys, like L for selecting entire loops and modifying geometry division quickly, are also extraordinarily helpful in terms of workflow.

Modo comes with all your traditional modeling tools and more. The Loop Slice tool for example slices off of a loop to create a new one which you can then manipulate quickly. You can then modify this edit with quite a few other parameters. Also, extruding and using the falloff as well as the sketch extrude tool to manipulate the geometry is very useful and quite fast. Many of modo's tools work this way and you'll find a nice list of tutorials covering all of these topics underneath the help folder.

In addition to its mastery level of sub-division workflow, Modo uses a cool system for pivots called action centers. Action centers simply allow translations, rotations, and scale to be reoriented anywhere you want in 3D space. Many other applications require you to use the pivot point as an action center. Modo's action centers are completely independent, allowing you to change them on the fly. Furthermore, Action centers not only apply to transforms but to all the tools in the system. Unfortunately, a lot of folks might become frustrated or confused when they see that they'll have to adapt to modo's way of doing things in this one area. But if users are willing to spend some time with the interface and set up their quick keys, this feature will not only be easier to use, but can be quite useful.

Modo also has symmetry capabilities that other software apps lack. The symmetry function is a modeling function that mirrors your actions on an axis, like X, Y, or Z. For example, if I moved a vertices on one half of the model, the vertices on the other mirrored axis would move simultaneously. Say you were modeling a face and moved your cheek up on one side—the cheek on the other side would move similarly. Another incredible feature is the embedded morph target blend/shape tool.

MODO 102

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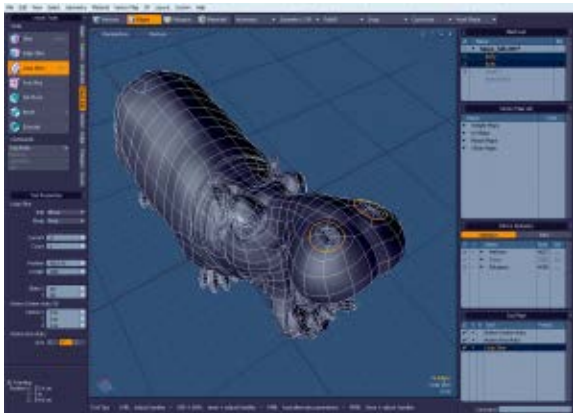
PROS
1. Great modifiers and sub-division modeling tools.
2. Video training and usability help get the user up to speed quickly and intuitively.
3. Embedded morph target blend/shape tool.

CONS
1. Would like more layer support.
2. Slightly high price (though Luxology recently reduced it and added discounts).
3. Wish list: Renderer and construction history.



Since these functions are all embedded into a single model, when you change the shape, all the other morph targets will be affected. Many of the other modeling programs contain painful work-arounds for this type of functionality, but Modo actually provides it. If you've ever created morphs for characters in games, you'll be very pleased with this tool. Morph targets can then be quickly exported out to most applications of your choice.

Lastly, Modo incorporates some really cool macro functions, which are similar to recorded actions you can find in Photoshop. Macro functions can save you some serious time when you're repeatedly performing the same actions. Check out the soccer ball example in the tutorials.

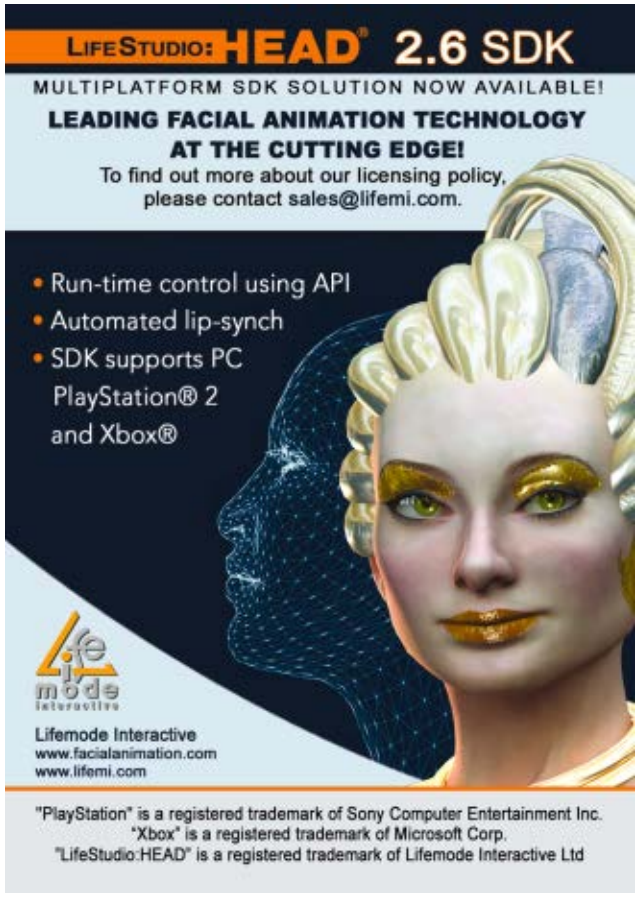
MEANS TO AN END

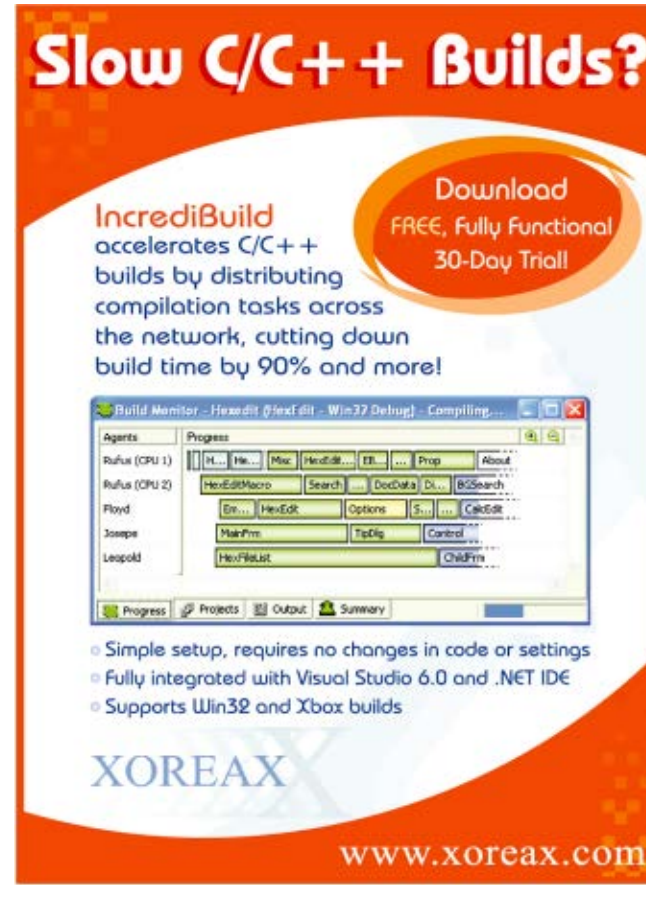
A programmer I work with often complains about the general inefficiencies of modeling programs, such as clunky workflow, inaccurate selection processes, and the like. Some of these complaints are addressed and placated by modo's focused design, which pretty well targets better usability and efficiency as its goals.

It's all a means to an end for developers. The solution, after all, is to find which modeling package is best suited for what you do on a daily basis. Many developers don't explore new packages because they are so accustomed to using a certain interface and fear change. Don't make this mistake. Sure, it always takes a while to get used to new software, but if you force yourself to do it, you might realize some functions are just better in a new package, and you'll increase your productivity. (You'll hear ZBrush converts make this same case for normal mapping and displacement map creation; see the review in the May issue.)

Modo is an awesome SDS modeling tool that many artists should definitely consider using in conjunction with their main 3D package. And if you're testing it out, you might even find its basic functions as intuitive to use as I did.

DAVID MARCH *teaches art creation for games at the Guildhall at Southern Methodist University. His most recent industry experience was with Crytek in Germany, where he completed work on FarCry. Email him at* ***dmarch@gdmag.com****.*





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THE STUDIO STANCE

MEGA-STUDIOS? BOUTIQUE STUDIOS? WHAT THE PUBLISHER'S METHOD COULD MEAN FOR YOU

APPLY FOR A JOB AT ACTIVISION AND IT CAN MEAN CHOOSING AMONG Vicarious Visions, Raven Software, Neversoft Entertainment—or any one of nine different studios, each with its own unique work environment, its own approach to game development.

That's very appealing to creative people, says Guha Bala, president of Vicarious Visions. "People want to have a place where they fit in, that serves their unique needs, that's very comfortable for them ... and not necessarily be part of a large corporate entity. Of course, Activision is now a large company. But, at the same time, within the studio environment, within that creative environment, we're able to preserve the feel of a small enterprise."

Elsewhere, at Electronic Arts, the world's largest game publisher is building mega-studios out of once-smaller entities. Maxis and Origin have been incorporated into EA Redwood City and Westwood has moved to EA Los Angeles (EALA).

"If you put enough creative people in a single place," says Neil Young, vice president and general manager of EALA, "you're going to have the opportunity to inspire one another more frequently. That is at the heart of our philosophy."

Activision and EA have faith in two very different management philosophies. With a little bit of generalization, one can theoretically sort today's leading game publishers into one of the two camps: those like EA, Midway, and Ubisoft that use a more centralized approach to acquire and then rename studios, and those like Activision, THQ, and Atari that use a more de-centralized approach to buy studios and then let them remain separate and retain their own identities.

EA: FROM PODS TO CELLS

EALA, with more than 425 employees, is home to such franchises as Medal of Honor, Command & Conquer, The Lord of The Rings, and GoldenEye. The studio was formed by fusing three EA branches together: EALA (formerly DreamWorks Interactive), Westwood Studios, and EA Pacific. Last year, Neil Young left his post as general manager of Maxis, birthplace of The Sims, to take the helm at EALA.

Young describes his studio as the one inside the EA system needing "the most help in terms of trying to unlock not just executional productivity, but creative productivity."

"What we're trying to do is stock our studio with as many creative, talented people as possible," says Young, "and give them everything they need to do what they dreamed about doing when they first got the notion of being in the games business. That requires you to think very

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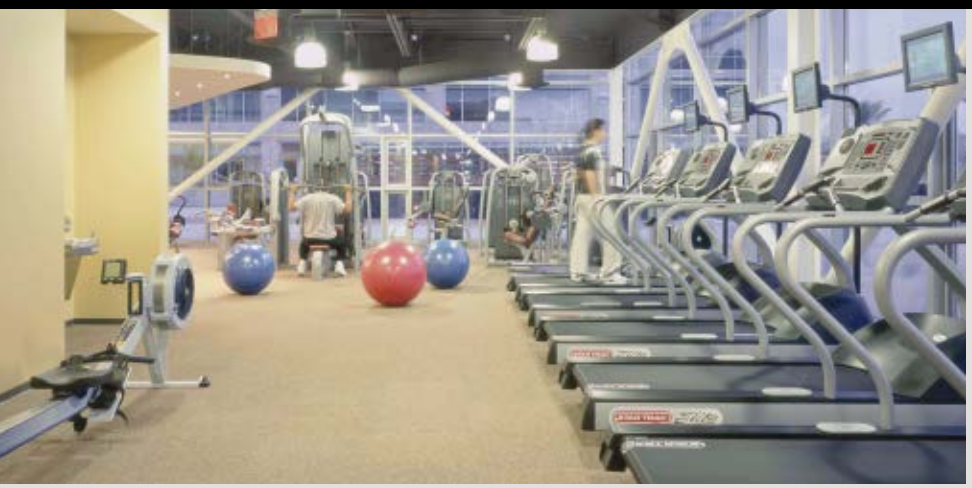


differently about how you build your organizational structure."

Young's goal is to take the current system of using interdisciplinary teams—called pods—of five to 30 people and transition to what he calls a homegrown "cell" system of seven people or less, based on the model renowned game designer Will Wright developed for his THE SIMS team. EA maintains that cells work best when interdisciplinary.

"The pod structure is phenomenal for executional productivity," explains Young. "It enabled us to build RETURN OF THE KING in 10 months with 177 people and earn a MetaCritic score of 85. But it doesn't necessarily unlock the creative potential of every single person in your organization. If you think about pods as orchestras, think about cells as rock bands, small groups of people out of which spins creative energy." [See p. 37 for Alan Yu's Business Level column about cells and prototypes at EALA.]

Since no EA game has yet gone through its entire lifecycle utilizing the cell approach, Young is unable to report its success. But he confirms that "it is creating a new and more nimble operating environment in which you're trying things and they are working and you're building upon them, or [they're] failing and you're restarting or collapsing the cell. This structure enables you to very quickly decode where the bottlenecks are, who the super-nodes are, and what the challenges are in terms of getting your software completed. If we're successful, we'll take our strategy and move it to the other studios in our system."

Neil Young, Electronic Arts Los Angeles

Steve Reid, Red Storm Entertainment

While Young says he's free to organize, motivate, and drive EALA, the mega-studio shares a common set of general processes, operating structures, and roles and responsibilities with the other EA studios. All are working toward adopting the Renderware platform that the company inherited when it purchased UK-based middleware provider Criterion in July 2004. And all of EA's studios are committed to what the company calls its "X Process," a production practice that has teams focus on the features of a game prior to going full-speed ahead on a project. So the team builds one level of a game before the studio commits to the project entirely to make certain everyone understands what the game involves.

Young tries to foster an esprit de corps at EALA by bringing the entire studio together every other week to talk about progress and strategies. Likewise, 35 studio leaders at the company occasionally meet to talk about business and listen to guest speakers. Young says the philosophy at EA is not for each studio to compete with its siblings, but to band together under the EA parent name—for, among other things, the investor's sake.

"At the end of the day, we're all one company, and we have a responsibility to shareholders, customers, and our employees to make the best games we can possibly make," stresses Young. "Sometimes competition can kind of cloud that. So we think more about collaboration than competition."

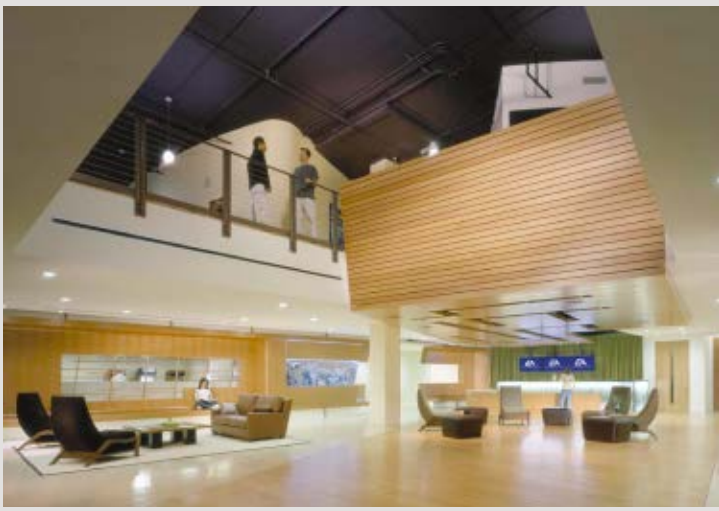
How do the developers at EALA react toward his programs? Young is blunt: "If you're not someone who wants to participate in that type of vision for the organization, there are probably different places for you to work, either inside EA or elsewhere. But if you're the type of individual who is committed to being a great games maker, I want to create the place where you want to be."

UBISOFT: STUDIOS NEAR AND FAR

At Ubisoft, Christine Burguess-Quémard, executive director of worldwide studios, looks at the company's 13 studios—ranging in size from the 11 developers at Blue Byte in Germany to 1,000-plus employees at Ubisoft Montreal—and sees a mixture of centralized and de-centralized management. For instance, when Ubisoft acquired Microids Canada (makers of SYBERIA II) in March, the entire 30-person staff was folded into Ubisoft's massive Montreal studio. "It would have been a bit ludicrous to keep a small group of 30 people next door to a studio of over 1,000," Burguess-Quémard says.

Ubisoft also centralizes the expertise of its studios and their knowledge management. All planning, staffing, technical hurdles, expenses, and personnel data is sent to the company's Paris headquarters where Burguess-Quémard's team provides the support needed by the studios to reach their annual objectives.

Ubisoft doesn't have an infrastructure in place to facilitate communication among its studios, but that may be indicative of their global nature with locations in such diverse spots (and



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Christine Burguess-Quémard, Ubisoft

Ron Moravek, Relic Entertainment

time zones) as Casablanca, Bucharest, Milan, and Shanghai. Instead, Ubisoft's Technology Board—a panel of technical experts from all its studios—stays up-to-date on the latest hardware and software, and serves as advisor when needed.

Otherwise, says Steve Reid, executive vice president of Red Storm Entertainment, Ubisoft's studios are pretty much on their own to meet the goals for which they were acquired. Reid helped found Morrisville, N.C.-based Red Storm in 1996, four years before it was purchased to help round out Ubisoft's catalogue. The studio's expertise was—and still is—making the squad-based, tactical shooter games for the Tom Clancy franchise.

Reid says that the interaction among Ubisoft's studios is typified by the fact that Red Storm has shared its strengths with its co-developers, which have benefited from the experience.

"The Montreal studio was able to take the same drama of the Clancy titles and create the Splinter Cell line," he notes, "which is based on many of the same principles but within a single-player, stealth action genre."

Other than being on the receiving end of suggestions from Paris about best practices and tools, Red Storm continues to function today pretty much as it did before being acquired, says Reid. "We still use our own products, tools, and engines; there are no restrictions on us."

What has changed is that Red Storm encounters far fewer hurdles today than previously. "Prior to being acquired, we had many more distractions from producing games," Reid notes. "Now, we're no longer spending time going after contracts or chasing down money from distributors or partners. We focus solely on creating the product. We may be a little more limited in the time we have to experiment, but we already enjoyed a successful run on making this type of game before we were acquired. Now, we're just getting the chance to do more of what we originally intended to do when we formed Red Storm."

Another advantage to being part of a large publisher is the ability to share information and people. Red Storm will occasionally ask for a specialist to come in for a few weeks or months and work as part of its team. Even rarer are long-term transfers over multiple years.

The trick, says Reid, is sharing information while disturbing daily business the least. "To function as a robust and profitable studio, I can't be needing help every day of the week. I want to have the stability in workforce of an independent studio but have all the benefits of being a wholly owned subsidiary."

At the moment, Red Storm, which employs 130 people, is working on three projects simultaneously, and the company is undergoing "casual growth."

"We're pretty much a hands-on management." says Reid. "At this size, we feel more like developers than managers. I know everyone in the building and there are never so many products that management is distant from the teams."

He describes Red Storm as the perfect example of an acquisition done right: "We've survived as a studio and, now that we're five years into it, we're still doing business the way we had intended to. I think we've proven that acquisitions don't always have to be painful."

THQ: NO FAILURE TO COMMUNICATE

In marked contrast to EA and Ubisoft, THQ is a publisher that believes smaller is better. Of its 10 studios, seven are domestic, Relic Entertainment is Canadian, and both Studio Oz and Blue Tongue are Australian. The average staff size is 100. The ideal size, says Jack Sorensen, executive vice president of worldwide studios, is between 150 and 250, which would enable three simultaneous projects at various stages. And, if any studio grows beyond 250, Sorensen says he would seriously consider dividing it in two.

"I can't even imagine a studio of, say 1,600 people, like EA Canada is," says Sorensen. "[If we were] at EA, our studio would be viewed as something that needs to be integrated and shut down because it's too small."

Sorensen came to THQ three-and-a-half years ago after spending a decade at LucasArts, where he was president for six years. His philosophy is to centralize what can easily be centralized and that which benefits the whole—like finance, legal, and purchasing—and leave game development alone.

"EA likes to standardize those things. I don't," says Sorensen. "They'll say that you need to have a development director, a senior development director, and three people on a project of such-and-such size. They'll dictate how each project is organized and mandate the headcount, kind of like a military operation. I leave that up to the studios."

Indeed, Sorensen admires the way each of his studios has its own unique production methods.

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```
action = new ActionTable("/example/DemoMIDP/action_01.mtra");
...
frame += action.getNumFrames(0)/10;
if( frame >= action.getNumFrames(0) ){
      frame = 0;
}
figure.setPosture(action, 0, frame);
g3.renderFigure(figure, 0, 0, layout,
effect);
```

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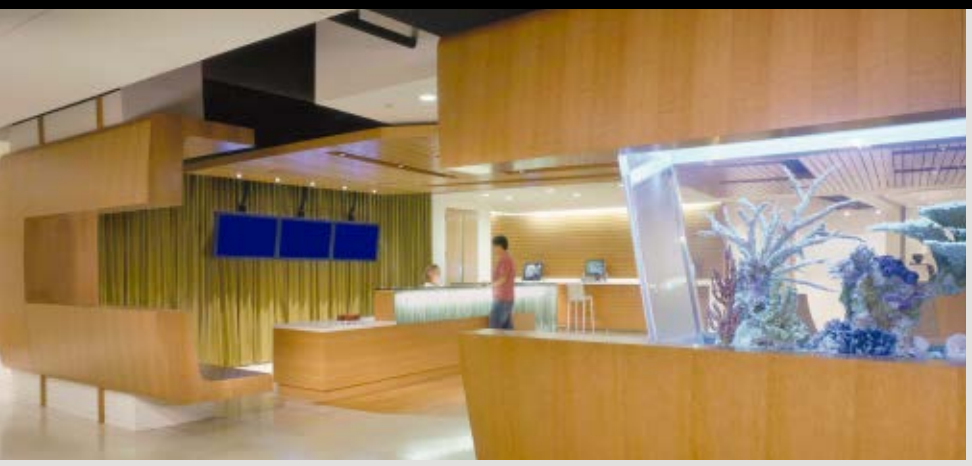

Guha Bala, Vicarious Visions

"Each of our studios has a strong culture, and each has a strong identity with the particular region where it's located, which is a big issue," he says. "We're firm believers that people like to live where they live, and so I don't move people around unless it's at the request of the individual. That's in marked contrast to a number of our competitors."

As a result, each studio has its own human resources person who, at the urging of the studio heads, communicates frequently with his or her counterparts in other studios. "I didn't want a single recruiting operation because so much recruiting is done locally, which is one of the strengths of having a dispersed studio system," Sorensen says.

According to Ron Moravek, communication is one of THQ's strengths and is a reflection of the faith the corporation has in its studios. Moravek is the general manager of Relic Entertainment, the Vancouver-based developer acquired by THQ last May and best known for the HOMEWORLD series of real-time strategy games.

"The great thing about Jack [Sorensen] is that he never forgets that the reason THQ bought each of its studios is that the company considered us experts in our given fields," he says. "So whenever he urges us to do something, it's more like 'What do you guys feel about this?' and then we debate it. I can't recall a time when anything has been imposed on us that we didn't like—other than THQ expense forms."

Moravek describes a period in which the eight-year-old studio considered acquisition offers from various publishers, and Relic finally settled on THQ. "We spoke to our various contacts in the industry and heard that THQ was great to work with, that it would try to do everything to leverage our strengths and support our weaknesses. And it wasn't about to say, 'We love what you're doing,' and then shut us down and move us to some mega-studio where we'd have to work on, say, a SpongeBob SquarePants RTS."

ACTIVISION: SUBTLE CHANGE IN THE WIND

In the mid- to late-1990s, Activision had built up a fairly large internal studio, recalls Guha Bala, president of Vicarious Visions, the studio which recently built DOOM 3 for Xbox. But, finding it difficult to manage a high-performance, creative enterprise in a large company environment, Activision began an experiment after acquiring Raven Software in 1997.

"It basically let Raven run relatively autonomously," recounts Bala, "and the model worked so well that Activision continued to identify developers that are best in class in certain types of games and to acquire them, allowing them to continue building on their successes." Indeed, that is the story of Troy, N.Y.-based Vicarious Visions, which became part of Activision in January.

"One of the biggest issues when developers are acquired is they lose their entrepreneurial flair," explains Bala. "They become part of a big company and don't have the same kind of survival orientation that makes them excellent developers."

But apparently there are some changes in the wind.

"As we transition to next-gen technology, if everyone starts reinventing the wheel independently, that's not such a good thing," he says. Bala believes that Activision is trying to balance out its autonomous independent studio model with increasing collaboration among studios in terms of technology development, outsourcing resources, and other shared services.

"It's very much a collaborative approach among the studios as opposed to a top-down 'here's how it's going to be' approach," he adds.

For Vicarious Visions, the move toward centralization means there will be a real opportunity to learn from the other Activision studios, says Bala, which will be facilitated by several ongoing projects, including a studio architecture initiative designed to create an effective IT system among studios. A high-speed network is in development that will allow for data transfer, video conferencing, and a range of different tools to allow for more effective communication.

In the meantime, Vicarious Visions—currently with a staff of about 110—is planning for growth, still continuing to work under the Activision banner.

"During negotiations with Activision, we didn't promote a broad awareness internally of the direction we were headed," Bala recounts, "but when we finally made the announcement, our employees were very happy we'd chosen Activision as our partner. We'd done over 20 products for them over a five-year period, and it was evident that there was a great cultural compatibility between the two companies."

TRIAL-AND-ERROR APPROACH

Looking ahead, if there's a trend taking shape—with an emphasis on further centralization or de-centralization—it's not apparent to studio heads interviewed for this story.

"There's just no consistent pattern," declares Bala, observing that most companies are trying to strike a balance between the two extremes. "The games industry is no different from any other industry in which there may be a number one, a number two, and a number three player," he says, "all of them healthy companies, but each having achieved their success in a unique manner.

"In fact, that uniqueness is very important. If all companies had an identical approach to labor policies and such, well, it wouldn't give game developers much of a choice, now would it? As things stand, if you're a game developer, whichever approach appeals to you, there are options available."

dan lee rogers

is the former president of BizDev, Inc. He is a principal with Interactive Studio Management, a leading agency and business management firm specializing in the video game industry. He can be reached at ***drogers@gdmag.com****.*

HALO IMAGERY COURTESY OF BUNGIE STUDIOS, SPIDER-MAN COURTESY OF ACTIVISION

PLAYING SMART WITH IP

THE BOTTOM LINE ON LICENSING

DESPITE THE RISK OF HIGH CHOLESTEROL, I OCCASIONALLY like to eat fast food. In fact, much to the amazement of my colleagues, the last time I was in England, I indulged in one of those super-sized meals that the Surgeon General keeps warning us about.

I know what you're thinking: Why would a sophisticated, good-looking, incredibly cultured guy travel 8,000 miles only to eat the same sesame-seeded burger he could have purchased at home? I was probably within centimeters of an incredible European cultural experience, and I threw it away for a Happy Meal. Truth be told, I was tired, hungry, and not in the mood to experiment. And perhaps most importantly, I knew exactly what I would get when my hamburger came sliding across the counter.

Video game consumers feel the same way about the games that they buy. Rarely are they willing to experiment. When Enter the Matrix was released by Atari in 2004, for example, it sold more than one million units in its first week, demonstrating that a well-timed video game based on a major film can achieve

TABLE 1: Top 40 Console Games Based on Life-to-Date Sales from 1995–2004

RANK	TITLE	ORIGINAL/LICENSED	PLATFORM	UNITS
1	GTA: VICE CITY	Original	PS2	Over 6.3M
2	SUPER MARIO 64	Original	N64	Over 5.9M
3	GRAND THEFT AUTO 3	Original	PS2	Over 5.4M
4	POKEMON YELLOW	Original	GB	Over 5.1M
5	GTA: SAN ANDREAS	Original	PS2	Over 5.1M
6	POKEMON BLUE	Original	GB	Over 5.0M
7	GOLDENEYE 007	Licensed	N64	Over 5.0M
8	POKEMON RED	Original	GB	Over 4.8M
9	MARIO KART 64	Original	N64	Over 4.7M
10	HALO 2	Original	XBX	Over 4.2M
11	POKEMON SILVER	Original	GBC	Over 3.9M
12	POKEMON GOLD	Original	GBC	Over 3.8M
13	HALO	Original	XBX	Over 3.7M
14	ZELDA: THE OCARINA OF TIME	Original	N64	Over 3.5M
15	GRAN TURISMO 3: A-SPEC	Licensed	PS2	Over 3.5M
16	MADDEN NFL 2004	Licensed	PS2	Over 3.4M
17	GRAN TURISMO 2	Licensed	PS	Over 3.3M
18	MADDEN NFL 2005	Licensed	PS2	Over 3.2M
19	GRAN TURISMO	Licensed	PS	Over 3.2M
20	CRASH BANDICOOT WARPED	Original	PS	Over 3.2M
21	CRASH BANDICOOT 2	Original	PS	Over 3.2M
22	SUPER MARIO BROS. DLX	Original	GBC	Over 3.0M
23	FROGGER	Original	PS	Over 2.9M
24	TEKKEN 3	Original	PS	Over 2.8M
25	SPYRO THE DRAGON	Original	PS	Over 2.8M
26	DRIVER	Original	PS	Over 2.8M
27	CRASH BANDICOOT	Original	PS	Over 2.8M
28	TONY HAWK'S PRO SKATER 2	Licensed	PS	Over 2.7M
29	MADDEN NFL 2003	Licensed	PS2	Over 2.7M
30	FINAL FANTASY VII	Original	PS	Over 2.6M
31	TONY HAWK'S PRO SKATER	Licensed	PS	Over 2.5M
32	SUPER SMASH BROTHERS	Original	N64	Over 2.5M
33	SUPER SMASH BROS. MELEE	Original	GCN	Over 2.5M
34	POKEMON STADIUM	Original	N64	Over 2.5M
35	POKEMON PINBALL	Original	GBC	Over 2.5M
36	DIDDY KONG RACING	Original	N64	Over 2.5M
37	METAL GEAR SOLID	Original	PS	Over 2.4M
38	SUPER MARIO ADVANCE 2	Original	GBA	Over 2.3M
39	NAMCO MUSEUM VOL. 3	Original	PS	Over 2.3M
40	DONKEY KONG 64	Original	N64	Over 2.3M

Source: NPD Group

spectacular results. Or consider that Activision's Tony Hawk's Pro Skater games have generated nearly $1 billion in revenue[1], and Spider-Man: The Movie for PlayStation 2 has sold more than 1.5 million copies. Then there is Electronic Arts' eternal John Madden Football—the 2004 PlayStation 2 edition sold more than 3.5 million copies to date, and the series total has exceeded 40 million units.

Part of the reason these games are successful is familiarity. You know what you're going to get when Madden comes sliding across the check-out counter. The same may perhaps be true of Spider-Man and many other license-driven games. With each, the consumer has a reasonable idea of the characters, style, and setting, long before they purchase the game. But this can't always be said of an original title.

ORIGINAL THINKING

If you think that licensed games sell better than originals, I have one word for you: Halo. Actually, four words: Halo and Grand Theft Auto. Both are original franchises, and both have broken all known sales records.

While the first Halo sold an impressive 3.5 million copies, Halo 2 eclipsed it, selling more than 2 million copies in just 24 hours, and over 5 million copies by early 2005. What's more impressive is that Halo 2 reached these sales figures without the support of a major motion picture on a console with a market share approximately one-third the size of PlayStation 2's. Or consider Take-Two's original title Grand Theft Auto: Vice City, which has been the best selling game in our industry's history, with domestic sales on PS2 alone exceeding $300 million.[2] That's roughly the same revenue that New Line Cinema's *The Lord of the Rings: Return of the King* generated at the domestic box office.[3]

Even though licensed games come with the built-in advantage of familiarity, historically, original titles have achieved higher sales. According to NPD, of the top 100 best-selling console games of the last decade, 70 were original titles. The PC market is similar, with more than 60 percent of the top 100 games of the 1990s based on original content.

If you're confused as to whether licensed or original IP may be a better bet for the future, you're not alone. Publishers have a difficult time deciding as well. For them, the proverbial grass always seems to be greener on the other side. Publishers that have traditionally been successful with licensed products are looking to create more original games, while those that have been successful with original titles are investing significantly in major film and sports licenses.

Both cite stability as their primary motivation, and both look to companies like Electronic Arts and Activision as a role models. EA's balance of licensed and original titles is the envy of the game publishing universe, and its recent successes with licensed properties such as The Lord of the Rings and Harry Potter may have hastened a re-emergence of the Hollywood Factor, with film companies (Warner Bros., Buena Vista) again swimming in interactive waters, like sharks in a Steven Spielberg film.

LEARNING FROM YOUR MISTAKES

Confident that a mother lode of cash was just beneath the surface of interactive waters, a number of film companies jumped into video game business with disastrous results. It appears that lessons have been learned, though. Lori Plager, senior director of licensing at Activision, believes gameplay has been a critical component in their most recent successes with license-driven products. Plager says

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before Activision acquires the rights to a licensed property, it first considers whether it has a developer capable of creating a quality game based on it. If so, then they discuss whether there will be enough time to create it. "We don't try to force fit," Plager says. "There's no point spending a lot of money on a property you don't know will make a good game."

Activision's strategy seems to be working well. During its 2004 fiscal year, 43 percent of its nearly $1 billion in revenue was generated by two license-based products: Tony Hawk's Pro Skater 4 and Spider-Man: The Movie.

A key reason publishers are attracted to license-driven products is that the revenue is more predictable. Games based on major films, for example, are able to leverage tens-of-millions of dollars worth of consumer awareness and advertising. Publishers these days are much more likely to pursue that route than to bank on the probability that they can make their home-grown character appeal to consumers. THQ is a good example. While it has made a concerted effort recently to develop more original titles, according to Germaine Gioia, THQ's vice president of licensing, 70 to 80 percent of its current lineup is based on acquired licenses. "It's a real stable business for us," Gioia admits, "It's part of our DNA."

Ted Price, founder of independent game developer Insomniac, creator of Spyro the Dragon and Ratchet and Clank, agrees that one of the most significant problems in launching an original game is getting consumer attention. "In creating new characters, the risk is that you have to compete with movies and media. There's a financial risk in doing that, in starting from scratch and telling people why your character is cool," says Price, who has been lucky in that arena. Even though his studio is independent, he develops exclusively for Sony, and his characters have been closely tied to the branding of both the PlayStation and the PlayStation 2. Halo did the same thing, slipstreaming the Xbox's original multi-million dollar advertising campaign in the same way that licensed games take advantage of a film's promotion.

RISK VS. REWARD

But Gioia cautions those who go it alone, saying the financial risks can be enormous. "You don't realize the time and effort needed to educate consumers about a property they have never heard of before. It's gargantuan. Once it happens, though—once in a purple moon—the results are spectacular."

And spectacular results are why publishers continue to risk money on original games. Collectively, Halo and Halo 2 have generated more than half a billion dollars in domestic revenue for Microsoft.[4] Take-Two's Grand Theft Auto series has generated nearly $1 billion. But few would be willing to count on sales of that magnitude. Activision's Plager comments, "At 5 million units, a product has a life of its own. You just can't predict that."

Gioia agrees. "At that level, it's a matter of the stars aligning." Gioia says she believes there's another message for publishers who are looking at Microsoft's success with Halo. "In some ways, it's a relief to see that hits like that can still be made. I really believe that at any moment it could be us."

In the meantime, publishers balance their release schedules in much the same way that financial analysts balance their portfolios—with the percentages of original and licensed-based titles reflecting the publisher's aversion to risk. Unfortunately, as licensed products have become more popular, the costs have risen dramatically.

THE COST OF LICENSING

When licensors lend their property to a publisher, most expect to be paid up to 10 percent (sometimes more) of the wholesale price of the game depending on the popularity of the license and the level of competition for the property. If a console game sells to Wal-Mart at a $32 wholesale price, for example, the licensor is going to expect $3.20 for every unit sold. It might not seem like a lot, but because the licensor is being paid on that wholesale price (before the publisher's costs are deducted), his or her royalty fees account for a substantial percentage of the overall profits of the game. If a publisher sells one million units of a license-based console game, for example, and the licensor receives 10 percent of the gross revenue, the licensor will earn approximately $3 million, which is more than twice the net revenue that a publisher is likely to earn at that sales volume. At two million units, the money looks better for the publisher. Here, the licensor earns approximately $8 million and the publisher $15 million.

CASH, UP FRONT

Not only is the overall amount of money important to licensors, but how much they receive in advance is becoming a critical negotiation point. Advanced royalties tend to correspond directly to the popularity of the license and the success of a product. Unfortunately, the more popular the license or more successful the game, the higher the advance payment to the licensor. Neil Haldar, vice president of production and business development at MGM, says that based on his experience, licensors look to take home one-fourth of the total lifetime royalties up-front. If licensors have reason to believe that their lifetime royalties will be $10 million, says Haldar, they will likely ask for a check for $2.5 million up-front.

On the other hand, says Gioia, it's difficult for a publisher to pay much more than half a million dollars in advance. "Any more than that," she says, "and it really doesn't work." Nevertheless, THQ has already paid significant royalties to at least one of its licensors. Analysts have estimated that THQ has paid *SpongeBob* and *Rugrats* licensor Nickelodeon more than $25 million in royalties since 2000.[5] When the original Nickelodeon licensing deal was about to expire last year, THQ renewed at a reported price of $75 million, and it wouldn't be unheard of if the advance to Nickelodeon exceeded half a million dollars.

Other deals may have been even more lucrative for licensors. According to Gioia, THQ had been negotiating for *Harry Potter* but backed out when the price got too high. The rumored amount of money EA paid out for that deal was $34 million. Additionally, other publishers estimated that the price of EA's exclusive, five-year deal with the National Football League was more than $300 million, and the exclusive, 15-year licensing contract with ESPN was even higher still.

MGM's Haldar says the game industry really has no one to blame but itself for these escalating prices. For the last several years, the interactive industry has been boasting that its sales have surpassed those of Hollywood box offices. According to Haldar, that claim has driven up the cost of film licenses. After all, if the video game business is as big as Hollywood's box office, then it can certainly afford to pay more for a license, right?

Haldar, who manages MGM's relationship with EA and other publishers, believes that the retail profit margins game publishers realize, combined with a clearer understanding of

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game financing, has translated into higher demands from licensors. In the early days, Haldar reflects, few outside the game industry really understood the financial relationship between a game's wholesale price and its production and sales costs. But all that has changed, and as our industry continues to grow, so too do the appetites of licensors.

SUPER-SIZING THE FUTURE

With a substantial increase in development costs expected for next-generation hardware, many publishers wonder just how much they will be able to pay licensors. Gioia compared this to THQ's experience transitioning from the PlayStation to the PlayStation 2. "Development costs went from $500,000 to $7 million, but the price of product didn't go from $39 to $79. So, [in the future] publishers will probably take fewer risks."

Insomniac's Price agrees. He believes that whether a game is based on original IP or a license, the key to its success is still gameplay. "It's really about getting good titles out," he says. "There really aren't a lot of great games made these days."

ENTER THE MATRIX **sold over one million copies in the first week of sales.**

Price's development expertise is in high demand, but he isn't interested in working with someone else's property, and he sees the upcoming transition period between console systems as a good time to launch a game based on original creations. "[Original] characters are important to hardware manufacturers. It helps brand the hardware. When you think of the PlayStation, you think of CRASH BANDICOOT and, hopefully, SPYRO."

Nevertheless, Price believes that original characters like the ones Insomniac created for Sony's home consoles may already be obsolete. The popularity of games like GRAND THEFT AUTO and HALF-LIFE, he says, demonstrate that gamers today prefer compelling environments over unique characters. "Characters as the end-all, be-all are a dated concept. That's from the days when platforms ruled. Today, it's about a great experience. Consumers want a great experience."

That consumers want a great game experience is true for license-based game as well. Today, publishers spend as much money developing their licensed games as they do on originals. Even so, having to deal with someone else's property adds a third dimension that can have surprising consequences.

MULTI-DIMENSIONAL THINKING

In the late 1990s, after completing a deal with J.R.R Tolkien's estate, Sierra Online began developing a series of interactive games based on the *The Lord of the Rings* book series. There was only one minor exception to Sierra's exclusivity: New Line Cinema had purchased the film rights to Tolkien's stories, and, as is common in the licensing world, had the right to create video games based on the movies produced. Unknown to Sierra, Electronic Arts also wanted to develop games based on Tolkien's works, obtaining interactive rights licensed through the film creator rather than the Tolkien estate. The two companies released their competing games within one month of each other in fall of 2002. By the end of 2003, it was clear that EA had the winning approach. EA's game replicated the look and feel of New Line's film, while Sierra was relegated to creating characters missing the now-familiar actor likenesses. EA's games received higher reviewer scores and sold three times as many as Sierra's, demonstrating not only the power of good gameplay, but perhaps even more importantly, the desire of consumers to play games based on a major motion picture—something that Sierra was not able to do with the license in hand.

In July 2004, in a move designed to take market share away from EA and JOHN MADDEN FOOTBALL, Take-Two released ESPN NFL FOOTBALL 2K5. Take-Two priced ESPN 2K5 at $19, a good $30 beneath the retail price of EA's MADDEN. The competitive pricing worked. ESPN 2K5 reviews were on par with MADDEN, and industry insiders believe that EA was forced to lower its price as a result. Someone had finally breached EA's sports fortress and was threatening its crown jewels. Unfortunately, Take-Two failed to consider the third dimension. In December 2004, EA announced an exclusive five-year deal with the National Football League, and in one move, Take-Two's strategy was shattered. A month later, EA announced a 15-year exclusive deal with ESPN, the brand that Take-Two was using for not only its football game but also hockey and basketball games. Take-Two had sold over one million copies of 2K5, but the momentum the company had gathered from it was instantly vaporized, with the exception of the acquisition of the Major League Baseball license.

Others have had difficulty with licenses as well. For example, before Acclaim declared bankruptcy, Mary-Kate and Ashley Olsen sued the publisher for $500,000, claiming that Acclaim's MARY-KATE AND ASHLEY line of games were "the single dark spot on the otherwise unblemished success story." In 2003, Activision sued Viacom Consumer Products over a dispute in its long-term *Star Trek* licensing agreement. Viacom counter-sued for $50 million, with both companies ultimately settling their differences in March of this year.

THINKING AHEAD

For a savvy publisher, licensing can be a strategic weapon, creating barriers to entry that make it practically impossible for rivals to compete. For the unwary, however, it can be an expensive and sometimes embarrassing lesson in strategy.

As we move into the next generation of games and consoles, licensing will undoubtedly play a critical role because many of the agreements already secured by publishers extend through this period. Additionally, Microsoft, Sony, and Nintendo are targeting a broader base of entertainment consumers with their new systems, purchasers who undoubtedly will opt for a known commodity. But new, original franchises will emerge as well. The financial rewards of a product like HALO or GRAND THEFT AUTO are simply too tempting to simply pass up—because, as Gioia says, "any moment it could be us."

FOOTNOTES

1 Activision 2005 Q3 10-Q report.

2 VICE CITY sales estimated at approximately $315 million at $50 per unit.

3 *Lord of the Rings: Return of the King* domestic box office revenue according to *Variety* is approximately $275 million.

4 Based on reported sales and estimated wholesale pricing to retailers.

5 Thestreet.com, *THQ Could Get 'Nick'ed by Viacom*, 9/27/04.

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POSTMORTEM

A COLLECTIVE BACKBONE

FOUNDATION 9'S DEVELOPMENT DREAM

BUSINESS DATA

DEVELOPER
Foundation 9 Entertainment

ESTABLISHED
March 2005

HEADQUARTERS
Los Angeles

TOTAL EMPLOYEES
400

TOTAL STUDIOS
6

EXECUTIVES
CEO: Jon Goldman
Co-presidents: Andrew Ayre and Douglas Hare
Co-chairs: Gary Priest and Mark Loughridge
CCO: Richard Hare
CFO: Steven Sardegna
COO: Larry Kelly
Vice president of Canadian operations: Jeff Vavasour

IN MARCH 2005, BACKBONE ENTERTAINMENT (MAKER of DEATH JR. and MIDWAY ARCADE TREASURES) and The Collective (which developed STAR WARS EPISODE III: REVENGE OF THE SITH and BUFFY THE VAMPIRE SLAYER) merged to form Foundation 9 Entertainment, the largest independent game developer in North America. The newly created Foundation 9 has more than 400 employees in multiple offices and a keen wish to completely control its own destiny. The company's position, along with its attitude, bucks the overwhelming trend of publishers acquiring independent game developers.

But how did Backbone and The Collective reach a stage where merging became a necessity? Will Foundation 9 herald a new age of super-indie game developers, and is this consolidation a stable way—or maybe the only stable way—to survive in the world of next-generation budgets and staff?

In this special Game Developer postmortem created for our business issue, we asked the co-founders of both Backbone Entertainment and The Collective to discuss, in traditional postmortem format, what went right and what went wrong during their tenure at their particular companies, and how they see this merger affecting their ability to make high-quality games going forward.

—Simon Carless

ANDREW AYRE *was president and founding partner of Backbone Entertainment and is currently co-president and founding partner of Foundation 9 Entertainment.*

DOUGLAS HARE *was vice president of production and founding partner of The Collective and is co-president and founding partner of Foundation 9 Entertainment.*

JON GOLDMAN *is chief executive officer and founding partner of Foundation 9 Entertainment and was chief executive officer and founding partner of Backbone Entertainment.*

BACKBONE ENTERTAINMENT

By Andrew Ayre

BACKBONE ENTERTAINMENT WAS ITSELF THE PRODUCT OF a merger, founded in 2003 when Digital Eclipse and ImaginEngine combined, creating a respected company that was particularly known for its licensed handheld games, classic game packs, and a wide variety of titles for kids. But, looking behind the scenes, here are some of the issues we faced in building the company.

WHAT WENT RIGHT

1 LOW INFRASTRUCTURE OVERHEAD. At the heart of the dot-com boom, when tech and software workers were soaking up millions in venture capital and buying Aeron chairs by the truckload, Backbone employees were still sitting on kitchen chairs at desks made out of old doors and saw horses. Our IT infrastructure was a little more involved than giving new employees a 20-foot long CAT-5 cable and telling them to find a free port, but it was close.

It wasn't pretty, but this kind of attitude enabled us to keep overhead down—key when you're building and investing. More importantly, we worked to keep infrastructure expenses down by keeping administrative staff to a bare minimum and outsourcing wherever possible.

For example, back-office accounting and book keeping was not done in-house, and we did not have administrative staff devoted to Human Resources. Although less expensive, it was not an ideal solution for a growing company. Payroll and benefits were also handled by payroll services and brokers. While these solutions were not always the cheapest in the short run, they offered flexibility

ART: TED NAIFEH

and scalability—key for managing short-term cash flow issues!

Last, but not least, one of our board members (and early investors) served as our General Counsel. Not only did he understand the business issues (not all lawyers do), but for many years worked virtually pro bono—an invaluable service and one for which we'll always be indebted.

2 **DEVELOP ORIGINAL IP AND 3D ENGINE TECHNOLOGY.** Although Backbone was particularly known for creating good quality, original handheld games based on licenses, we felt we could do more. We wanted to create an original property, a property that would be as at home on a 3D console as anywhere. Unfortunately, we had a hard time finding people on the publishing side that shared that opinion. To prove to them that our idea was worth pursuing, we would have to make a significant portion of the game ourselves first. So in late 2002, we decided to invest heavily in creating original 3D technology and in an original property and game design.

We used operating profits to fund R&D and concept development for DEATH JR. Also, critical to the self-funding process was a strong relationship with our commercial bankers. We have a bank who understands our business and a long history of financial stability which enabled us to secure favorable lines of credit. While this may not have contributed directly to our effort on DEATH JR., it certainly gave us the flexibility to invest.

The strategy was risky. Investing in unfunded development can be nerve-wracking and expensive for an independent developer—but it paid off. At GDC 2004, we were invited to be part of Sony's keynote presentation, premiering DEATH JR. as the first game ever shown on the new handheld system. Needless to say, this opened a lot of doors, including our signing of DEATH JR. with Konami later in 2004.

3 **SMALL, FAST, AND DEMOCRATIC.** As an independent developer with offices in the San Francisco Bay area and Vancouver, there was no way Backbone could (or can) compete with Electronic Arts on a dollar-to-dollar salary basis. Luckily, we were able to attract our talented employees creatively by offering prospective team members more input on their prospective projects. We found that making a strong, noticeable contribution on a project is its own reward, especially for developers who don't want to be identified within some mammoth-sized studio as "Animator 1138."

Our small, democratic style may have enabled us also to keep everyone at Backbone excited about the games they worked on. Our people usually didn't have a great choice of what to work on, and as a handheld developer, Backbone made a lot of kids' games, a genre many developers look down on. Nonetheless, we always seemed to get employees excited about each project, whether it was LIZZIE MCGUIRE or DEATH JR. At the end of the day, every game presents a unique challenge, regardless of its target audience.

In addition, by keeping our client list diverse, spanning everyone from the "big six" game publishers to Steven Spielberg's Starbright Foundation, we insulated Backbone against financial instability at the publisher level. Whether it was a big client who habitually paid 60 days late, or a publisher who went out of business and left us holding the bag for hundreds of thousands of dollars in development costs, we made sure we didn't put all our eggs in one basket.

WHAT WENT WRONG

1 **NOT KNOWING WHEN TO SAY NO.** Getting offered a game or landing a deal is always a heady experience when you're an independent developer. As a business owner, it's difficult to say no to new business. Unfortunately, we had to learn the hard way to analyze deals and relationships and walk away from the ones that weren't profitable.

We found ourselves on the wrong side of this equation more times than we wanted to. We would agree to do a project without enough upfront analysis, and halfway through, we would find ourselves having to add resources, eating through any buffer in the advance and quickly biting painfully into our yearly profits. Once a game is signed, a developer has a responsibility to deliver the best product it can, so we learned to be a lot more honest with ourselves and the publisher when analyzing the profit potential of a given project versus the development expenses before agreeing to take on the assignment.

The STAR WARS EPISODE III game launched ahead of the movie.

2 **EMPLOYEE BURNOUT.** One of the best things about Backbone was the employees' dedication to "stepping up" when the situation required it. The side effect of stepping up, however, is frequent burnout—and we were guilty of burning out employees through excessive work.

The burnout scenario held true for both line employees, from whom we just asked too much,

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and supervisors and managers, who found themselves suddenly doing two jobs: management or lead roles, and direct resource production. Unfortunately, once someone is fried, there's rarely a way to make things right again; we lost some good people due to burnout.

3 MEDIUM, SLOWER, AND TOO MUCH DEMOCRACY. In a lot of ways, the very structures, or lack of structure, that enabled us to grow quickly, bit us in the ass as we started to get bigger. As team sizes grew, our lack of formal structure caused miscommunications and resulted in lowered efficiency on larger projects. A network architecture that was put together with bubble gum, rubber bands, and hope started to behave that way as Backbone expanded from 20 employees to 200.

Also, our old, informal system of production oversight couldn't scale with the growing size of the company. Putting in more formal structures was not always a pain-free process, and we had to make some hard choices about doing things "the way we always did them"—whether that was production styles or infrastructure procedures—and the ways we were learning we needed to do them to continue to grow.

THE COLLECTIVE

By Douglas Hare

FOUNDED IN 1997, THE COLLECTIVE BEGAN WITH three co-founders working on projects such as MEN IN BLACK and THE GAME OF LIFE for PlayStation, then evolving to make games based on other popular licenses, such as BUFFY THE VAMPIRE SLAYER, INDIANA JONES, and STAR WARS EPISODE III. In eight years, The Collective grew to more than 100 people strong—a substantial size that puts us in a good position to discuss the positive and negative aspects of The Collective's development career.

WHAT WENT RIGHT

1 CREDIBILITY AND STABILITY THROUGH LICENSES. Since The Collective's inception, working with licenses—especially widely popular ones-has helped build our reputation. During our first year, for example, more people suddenly became interested in talking to us the moment we started work on the PlayStation version of MEN IN BLACK—a game based on the biggest movie of that summer. So even though we were just developing a ported version, the title's name recognition gave us automatic credibility.

I think it's pretty safe to say that for high-end console games, titles based on licenses have a far greater chance of making it to market than an untested original property. By working on top-notch licenses, The Collective ensured its survival and growth over the years. Even though we recognize that original IP is important, had we single-mindedly pursued only games based on it, there's a good chance we would have joined the swelling ranks of independent developers who have unfortunately gone out of business.

2 HIRING THE RIGHT TALENT. A developer is nothing without the right people. As it's turned out, we've been both lucky and smart in hiring the right people to build our teams.

When considering who to hire, higher education and industry experience count for a lot; but on a number of occasions, we've hired people who show us amazing game demos, engines or tools that they've put together in their spare time or without a degree. This type of applicant demonstrates self-motivation, stamina, and passion, which are some of the key attributes we look for in our hires. A strong demo can definitely tip the hiring decision in a person's favor.

3 LICENSED GAMES FOR HARDCORE AND CASUAL. Whenever we worked with licenses, we spent a great deal of time researching and familiarizing ourselves with the content and the reasons why people like it. We took this knowledge and used it to create games that are true to the spirit of the licenses. Our goal was to make a game that would be appreciated as authentic by those who know the license, but would also be enjoyable for anyone—even people who didn't like the licensed content in its original form.

For the non-hardcore game audience, we intertwine many pop culture references into the games, for example, a STAR WAR EPISODE III game scene that imitates a familiar movie moment from *Indiana Jones and the Temple of Doom*, with

Foundation 9 title MARC ECKO'S GETTING UP: CONTENTS UNDER PRESSURE.

(L–R) Jon Goldman, Andrew Ayre, and Doug Hare of Foundation 9.

Obi-Wan reaching under a swiftly closing door for a lost item in the same fashion that Indiana Jones famously did.

WHAT WENT WRONG

1 **MISSED DEADLINES, MISSED CASH.** For independent developers, survival is entirely dependent on being paid by publishers. Whenever a developer is late delivering a milestone, they don't get paid on time, which can create a financial hardship. The bills still need to be paid. And publishers won't agree to pay for the extra, unscheduled time.

The Collective ran into this problem early on, and my partners and I had to feed a good chunk of our own money into the company to keep it going. Whether coming from the internal desire to make the biggest and best games or as a result of publisher requests, we frequently increased the scope of the game or changed tack without thoroughly analyzing if we could reasonably accomplish all these things while sticking to the schedule. Changes like these not only made us late, but also cost the team a fair amount of crunch time.

2 **GROWTH CAUSED ADMINISTRATIVE ISSUES.** While we never expected The Collective to stay small, we did underestimate how the growth would alter corporate culture and the needs of the company. For example, we had to move to new office buildings a number of times simply because we didn't anticipate how much we would continue to grow. We would move into a building and swear we would stay there, only to have our numbers increase drastically and within a couple of years, find ourselves packing up and moving again.

By necessity, Richard Hare, Gary Priest, and I wore many hats during the earlier years of the company (handling payroll, accounting, HR issues, system administration, assembling furniture for new hires, and so forth). It took a long time for us to break out of those habits and hire people who could take over those roles. On the actual development side, it took longer than it should have for us to start bringing in project management support and place people in director roles. As a result, the rapid growth of the company eventually caused us to become the bottleneck on a number of different fronts. Thankfully we're now in a position in which the structure of the organization is far, far better (although there's always room for improvement).

3 **CHALLENGES OF COMMUNITY.** When you have many new people joining the team and lots of people who don't work directly together, it's a huge challenge to make sure everyone feels connected to everyone else. In its early years, The Collective worked on only one project at a time, so only one team was needed, a family-like team. But that all changed, and now we were left constantly trying to figure out ways to bring back that family feel.

We tackled this in a number of ways: included more engaging and frequent company events; put out a regular company newsletter; and set up the organizational structure so people can be involved in multiple projects rather than just one. We also became more open with information about the company. Hopefully, everyone felt like they knew what was going on at The Collective, especially when we decided to merge with Backbone.

FOUNDATION 9 ENTERTAINMENT

By Jon Goldman

WE FIRST MET AND BEGAN TALKING TO DOUG, RICHARD, AND Gary from The Collective little more than a year ago at Sony's 2004 E3 party. We realized that as much as we all respect our "garage band" roots, publishers are not looking for garage band developers these days, especially as we move into the next generation. As Foundation 9, newly expanded to include developer Pipeworks, we have three main goals that would take significantly longer to achieve if Backbone and The Collective were still independent entities:

1 **ECONOMY OF SCALE.** We are able to quickly realize some economies of scale, not only on the back-office and business development sides, but also, crucially, on the technology side. Although the merge is new, and tech-sharing has only just begun, we're already seeing real benefits here that will make us more appealing as a developer and also enable us to make better games. At the same time, by not selling out to a publisher we're able to stay in control of our destiny and continue to foster a small company feeling among development teams.

2 **BETTER DEALS WITH PUBLISHING PARTNERS.** As a larger company, we are more attractive to our publishing partners. We not only have the financial stability that publishers like to see, but are better able to reach beyond traditional developer roles to generate new ideas, like develop IP to a fairly complete state (thus mitigating publisher risk). We can also reach out through our various other relationships, such as our new strategic equity interest in management company Circle of Confusion, and bring in non-game talent to help make products shine.

DEATH JR. **for PSP showcases original Foundation 9 IP.**

3 **FOSTER FUTURE ORIGINAL IP.** Our larger size enables the company to work on funding future IP development. We've had a great time creating DEATH JR. and other IP internally. The experience has been extremely rewarding from a business and creative standpoint, and the excitement around the game caused a heightened interest from the recruitment end too. People like working in a creative environment on creative projects, and that's made us more and more attractive to prospective employees. Obviously, we don't see IP creation ever supplanting our core work-for-hire business, but it is a really important and attractive new area.

SOME PEOPLE HAVE ASKED IF OUR GOAL IS TO BE A PUBLISHER ourselves: That is not in our plans. We don't want to grow into becoming a publisher; we want to become a better and better developer. At the end of the day, building a developer is not the same as building a publisher, and our skill set simply does not overlap with being a publisher.

SEAN BARRETT

OPTIMIZING PATHFINDING VI: HPA*

THIS COLUMN IS THE SIXTH AND FINAL ONE in this series exploring methods of performing pathfinding that scale to very large sizes—say, 10,000 units on a 1,024x1,024 tile map. In the first column, I presented a general system for getting useful comparisons between multiple methods and looked at priority queue implementations. In the second and third columns, I described how certain movement models led to efficient implementations, and how an inadmissible A* search can be problematic and isn't much of an improvement in the hard cases. The fourth column pointed out that while A* is generally considered performance optimal, there's reason to think 2D pathfinding might admit more efficient optimal solvers. And last month, I looked at various methods for precomputing pathfinding information. In an ideal world, we'd have some kind of data structure that lets us "look up" pathfinding in some efficient method that doesn't require any searching, and I described a compromise algorithm that traded speed for size, but which unfortunately still used too much storage.

More than a year ago Botea, Müller, and Schaeffer published an article on an algorithm they called HPA* (see References). Using their work as a base, I'm going to describe and analyze a variant of their algorithm. HPA* is noteworthy because it's a general-purpose hierarchical pathfinding algorithm. It doesn't require any human annotation of waypoints or "rooms," so it can theoretically be applied to any data set.

ESSENTIAL HPA*

The basic principles of the precomputation step of HPA* are illustrated in Figure 1 (page 32). Given a tile map containing obstacles—that is, all edge costs are either 1 or infinity—we begin by dividing the map into larger scale grid tiles (the HPA* authors recommend 10x10, but the figure uses 8x8 for greater clarity). We then locate all map tiles where it is possible to move from one grid to another. These locations will appear in pairs (see Figure 1B). Each of these transition regions are then used to generate one or two nodes in a higher-level graph; if the region is less than six nodes wide, a single node at the center of the region is used, otherwise two nodes, one at each end, are used. Two kinds of high-level graph edges are created. Edges between adjacent tiles in different grids simply use the actual edge costs of transitioning between those tiles. (Because Botea et al. use a slightly different rule for diagonal movement than I do, no diagonal edges are needed for cross-grid connections. I have followed their rule in Figure 1C.) Nodes also precompute shortest distances to other nodes in the same grid square and store grid-internal edges to these nodes with those distances. If a node cannot be reached without leaving the grid square, there is no edge. Similarly, the actual precomputed costs must be the cost of reaching the other node without leaving the grid square.

To perform an HPA* search, first find the grid square for the start and end locations. Compute the distances from each of these points to the high-level nodes in that grid square. Conceptually, you create a new graph with the start and end point added, with edges from each to their nearby high-level nodes. Next, perform an A* search on this graph to get a "high-level" path. Finally, recover the low-level path by performing small A* searches from high-level node to high-level node, searches confined to a single grid square.

The full HPA* algorithm is fully hierarchical, with additional, even-higher levels. Because the HPA* paper doesn't indicate any significant performance benefit to using these levels, I'm not going to describe them nor implement them in my variation.

BOUNDARY HPA*

One thing that's obvious, looking at Figure 1C, is the number of essentially redundant nodes, such as the four-cluster at every corner, and two immediately adjacent nodes everywhere else. It might make more sense to treat edges crossing grid squares as the high-level nodes, and pathfind on those, except it's not clear how to correctly do the traversal cost accounting. Figure 1D shows an alternative simplification, based on the precomputation strategy I described in the May column (see References). Instead of dividing the tile map into grid squares such that every tile is in a grid square, the map is divided into grid squares and boundary tiles, such that every tile is either in a grid square or is a boundary tile. I'll call this algorithm Boundary HPA*, or BHPA*.

We then construct a high-level graph based on the boundary tiles, again finding straight-line regions of them and simplifying those regions to just one or two high-level nodes. This reduces the number of nodes significantly, but the number of edges per node increases. However, since pathfinding performance is generally driven by total number of edges explored and number of active nodes, and the total number of edges has decreased (we no longer have all the very short grid-transition edges) as has the total number of nodes, BHPA* should perform better than HPA*.

Because Botea, Müller, and Schaeffer only distinguish obstructed tiles from unobstructed tiles, they don't provide any guidance for how to deal with a tilemap that has varying map costs. Various heuristics can be applied, but to simplify my life I've chosen to similarly restrict my implementation to obstructed/unobstructed only.

DYNAMIC MAP CHANGES

An algorithm that relies on precomputation isn't really solving the same problem as a regular pathfinder, since it can't cope with changes to the map without extra effort. A direct comparison of the performance of pathfinding of the two algorithms doesn't give enough information to determine how competitive the two algorithms will be in an actual game. So we have to do two things: design a solution to the map-changing problem that is reasonably efficient, and figure out a way of measuring and comparing. (Additionally, HPA* doesn't

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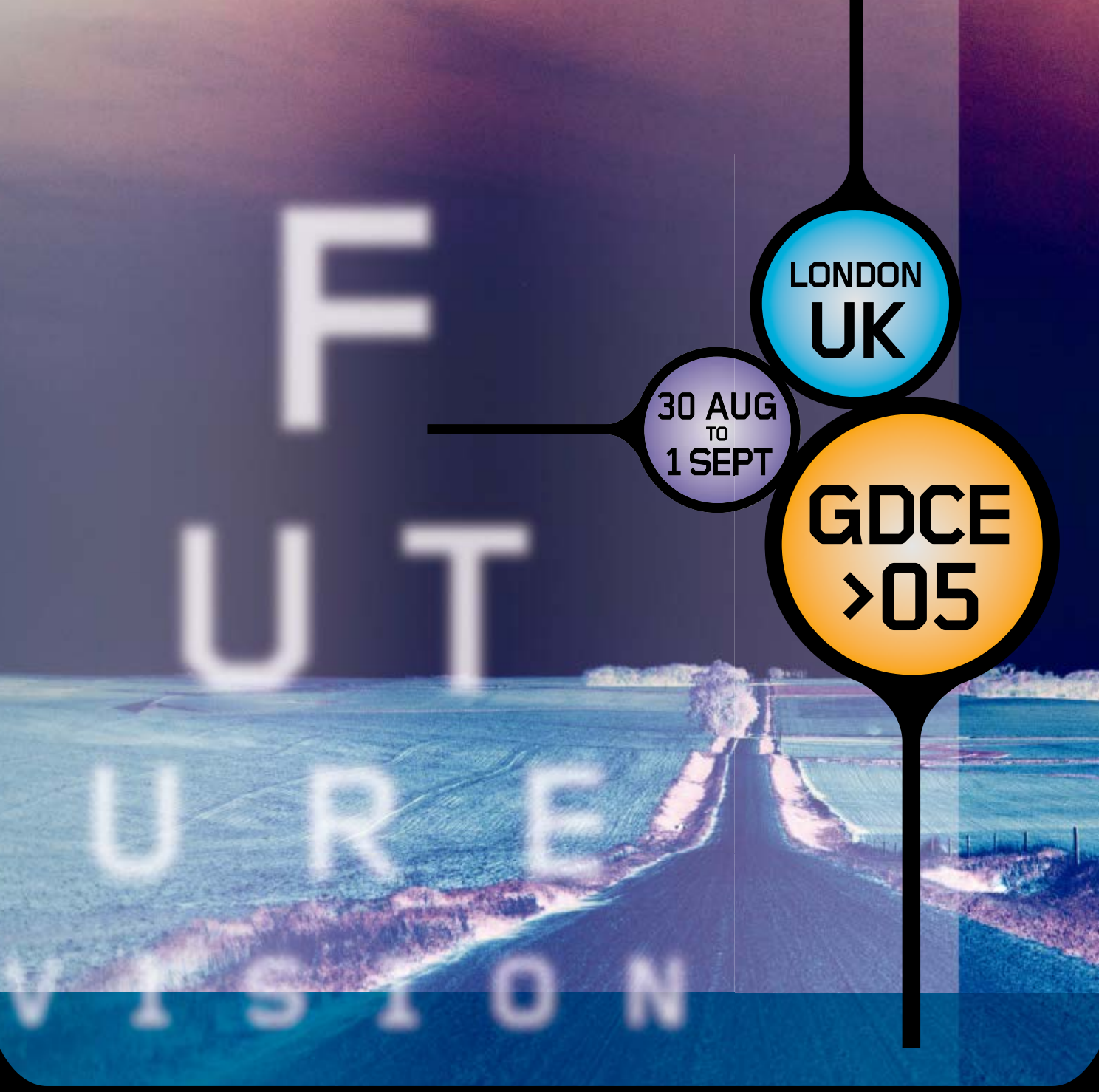

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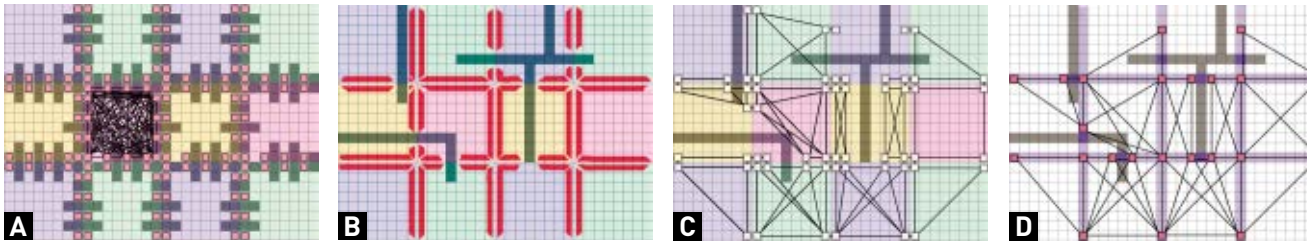

FIGURE 1 **A simple tile map (A). HPA* divides the map into grid squares and finds edge regions that border each other (B). HPA* turns each region into one or two nodes and connects simply-reachable nodes (C). BHPA* divides the map into grid squares and blue "boundary tiles," and applies a similar process (D).**

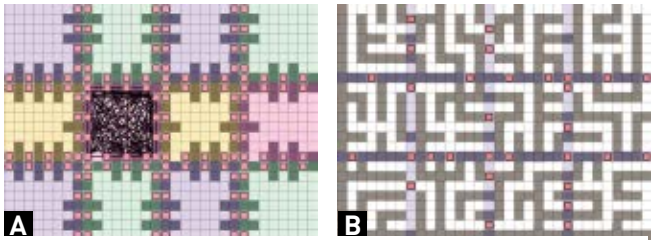

FIGURE 2 **A worst case for HPA* which makes it grossly inefficient (A). A more plausible bad case which doesn't really look too bad. However, placing BHPA* nodes requires much cleverness, whereas HPA* would be more straightforward (B).**

find the optimal path, which is a potentially significant difference, but I think comparisons can still be made, as I described previously for inadmissible A*. Using a "cleanup" post-process to improve path quality should make the non-optimality irrelevant in practice.)

Clearly, one advantage of HPA* and BHPA* over traditional waypoint-based hierarchical techniques is that it's even possible to cope with map changes. Because we use an automated system to generate the high-level hierarchical graph, we can obviously regenerate a new one after every map change—this isn't even possible without automatic generation. The actual challenge is to do this incrementally, rather than recompute it from scratch. The HPA* article points out that the information is entirely local; there are only within-grid-square edges and single-step grid crossings. However, it does not suggest an efficient algorithm for coping with changes, nor give any sense of the cost.

In the case of a border tile changing, complex work is required. A transition region may have split, or two such regions may have merged. Even if the region hasn't split, the tile that has become obstructed or unobstructed may be at the edge of a transition region, thus requiring changing which tiles represent that transition region; a transition region may have grown in size such that it should switch from being represented with one node to being represented by two. It might be appropriate to use hysteresis, switch from one node to two when a region grows to seven nodes, and switch from two nodes to one when a region shrinks to five nodes. At all these steps, it's necessary to perform a single-source, shortest-paths search from the border node to all the other border nodes in adjacent grid squares to update the edge costs.

Fortunately, border tiles are rarer than within-grid-square tiles, so the extra complexity is required less frequently than tiles from within grids, which is the case to focus on. Naively, after any change to a grid tile, we need to recompute the costs from each boundary node that border that grid region to every other boundary node in case they've become shorter, longer, or inaccessible. We have two non-naive options: We can recompute within-grid costs lazily—waiting until the next search tries to examine these edges before recomputing them—or we can try to accelerate the cost of updating a single tile. The former approach will depend on the particular map layout and pathfind distribution for how effective it will be so, I'll look into the second approach instead.

Optimal paths have an important "substructuring" property. If an optimal path from P to R goes through Q, then any optimal path from P to Q followed by any optimal path from Q to R is an optimal path from P to R. In terms of distances, this means that if an optimal path goes through Q, then the optimal distance from P to R is the sum of the optimal distances from P to Q and Q to R.

Consider some tile Q becoming unobstructed. The optimal distances between other points can only become shorter—all previous paths are valid, but new ones are possible. If we perform Dijkstra's single-source shortest paths from Q within the grid square, we can compute the optimal distance from Q to all other points in the grid square, and even to all adjacent border tiles. If P and R are two border tiles with an edge between them with cost PR, then we can compute the cost of connecting P and R through the best path through Q: PR´=PQ+QR. If PR´ is less than PR, we store PR´ as the new optimal cost. The performance cost of this update is $O(n^2+b^2)$, where n is the width of a grid square, and b is the number of border tiles around the square. Note that this has no dependency on the internal complexity of the grid or on how many paths are actually changed.

OBSTRUCTED TILES

The harder case is if some tile Q becomes obstructed. In this case, paths between border tiles might no longer go through Q, and we can't rely on a single computation from Q to determine the new costs. We can at least use the same basic trick to determine which hierarchical edges need updating. Before obstructing Q, we perform the same single-source as above. Then we obstruct Q. Now, for each pair of boundary tiles P and R, we again look at PQ+QR and compare it to the existing edge PR. If they are equal, then an optimal path used to go through Q, and we must recompute PR (using A*). Note that just because an optimal path went through Q doesn't mean the optimal path got any longer; if the grid square was entirely unobstructed and we placed a single "pillar" in the middle of it, certain paths become obstructed but in most cases there are equal-length routes around it.

The cost of performing this obstruction algorithm is something like $O(n^2+b^2+zd)$,

where z is the number of edges that need refining and d is the cost of doing this refining. In the worst case, z is $O(b^2)$ and d is $O(n^2)$, and the update operation is $O(b^2n^2)$. If you can think of a better way, please write to me.

Botea et al. explain that the search algorithm depends on the grid size in that larger grid sizes result in less high-level searching but require more work to initialize the start and end location. They found a grid size of 10x10 to be appropriate. However, they didn't consider the costs of updating the hierarchical graph as nodes become obstructed and unobstructed, which we can see from the above example, which strictly increases as grid size increases. Thus, a smaller size might be more important in the presence of frequent obstructions and unobstructions.

Given the significant costs, care should be taken not to burden the BHPA* algorithm with obstructions and unobstructions simply from units moving around, since these operations are so expensive. For example, one might consider only stopped units to be obstructions, and rely on local pathfinding to route around moving units.

I'm not providing any performance figures this month, because there are so many variables—map layout, pathfinding distribution, grid size, map change frequency, and map change types—and also because I haven't fixed all the bugs in my implementation. What I would recommend is to hold everything constant except map change frequency and then graph the performance ratio between the two algorithms as this changes. The crossover point, if there is one, might be revealing.

Botea, Müller, and Schaeffer offer some numbers (for example, an overall improvement over A* of 10), which should be taken with several grains of salt. They used the same data structure implementation for both HPA* and A*. But I've shown in past columns that different algorithms can leverage different data structures, so algorithm-agnostic data structures provide a misleading picture. The performance numbers don't appear to include the cost of their path refinement stage ("cleanup"). Finally, they don't measure the cost of dynamic updates. My expectation is that, with no-dynamic-changes, BHPA* will give no improvement over A* in the easy cases, a significant (2–4 times) improvement in hard cases, and large (5–10 times) improvement the worst cases, although this will depend on the grid size chosen.

FURTHER RESEARCH

As the HPA* authors note, there's no real reason that the "clusters" used for the hierarchical graph need to be laid out on a grid—it's simply convenient. It might be more productive to choose clusters based on their actual internal and external connectivity. For example, Figure 2A shows a carefully constructed map for which HPA* will behave extremely poorly because its heuristic for creating cluster transitions is inappropriate. Note that this only occurs because the map is consciously chosen to defeat HPA*. An actual maze-like map as shown in Figure 2B will be reasonably well behaved. Still, you can imagine forming clusters that follow the contours of the maze instead, with border tiles only at the branching points. Such a strategy will likely be significantly more efficient for this sort of map.

A crazy research topic: BHPA* "lossily compresses" the border transition regions using edges whose weights are the optimal costs of going between two "representative" tiles of the region. If we instead encode the lowest cost of going between any two nodes in the two regions, we could use a BHPA*-style hierarchical graph to compute guaranteed lower bounds between two nodes. This could then be used as a heuristic for a non-hierarchical A*, allowing you to get optimal paths and skipping the refinement step. It's not obvious how to make it work, though, but somebody should try.

That's it for pathfinding! I hope I never write about it again.

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OTHER ARTICLES IN THIS SERIES:

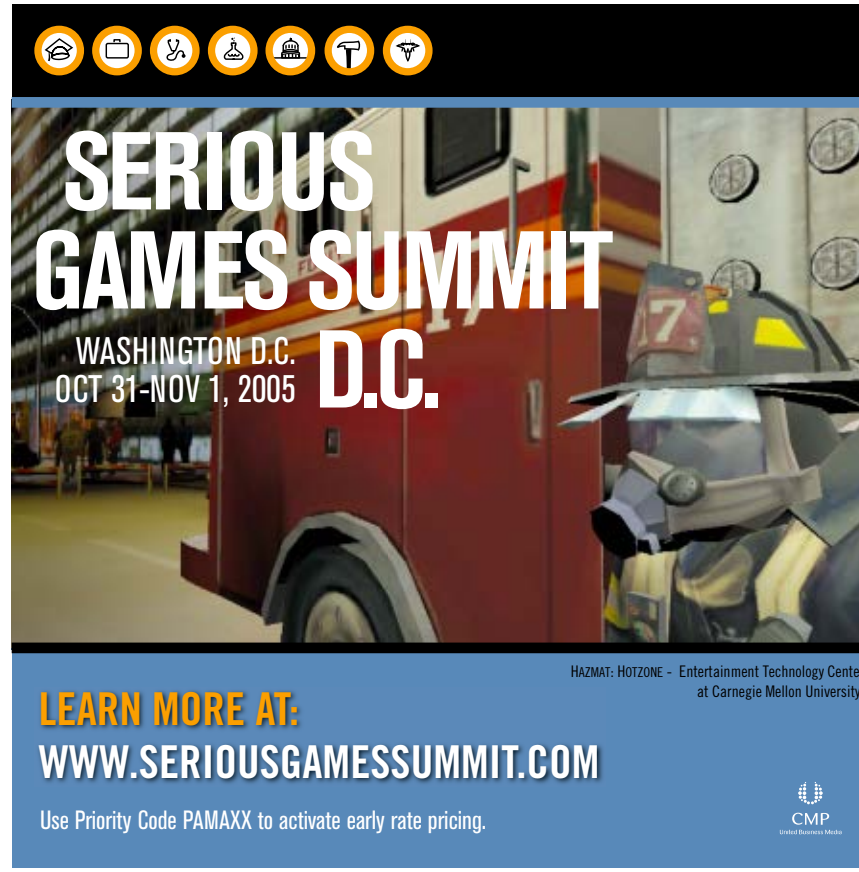
"Optimizing Pathfinding V: Precomputation," May 2005.

"Optimizing Pathfinding IV: Beating A*," April 2005.

"Optimizing Pathfinding III: Inadmissible Heuristics," March 2005.

"Optimizing Pathfinding Part II: Modeling," January 2005.

"Optimizing Pathfinding Part 1: Low-Level," December 2004.



STEVE THEODORE

RESUME IN REEL TIME

WE'RE ROUNDING OUT LAST MONTH'S discussion on the art of job hunting by looking at the really important parts of the application process: the resume and demo reel.

Your resume isn't just a neutral transcript of your past career, it's a precious opportunity to get the full attention of the person who can hire you. In the business world the rule of thumb is that the resume gets less than 20 seconds of the reader's undivided attention. Those precious seconds are your window for positioning yourself clearly, and as you can imagine, there's not a lot of room for subtlety. A resume bears more resemblance to a tightly targeted ad campaign than it does to a biography.

CUSTOMIZATION

The real difference between successful and unsuccessful resumes isn't the presentation—it's the content. Most companies are looking to fill specific slots, so most of the time and energy you put into crafting your resume should go toward fine-tuning it for each specific application. Your resume has to tell a story that underlines your fitness for the job. A description for a level designer job, for example, might emphasize the 3D modeling aspect, game design skills, or production pipeline management issues. Which description you choose depends on the job you are seeking. It's unfortunately true that groping for multiple ways to describe your past achievements can become pretty tiresome. After a few applications, though, you'll build up a library of targeted resumes that can be recycled for similar jobs with very little effort.

Of course, don't confuse legitimate marketing with dishonesty when adapting your resume. There's a world of difference between selectively highlighting aspects of your real experience and inventing skills, responsibilities, and job titles. It's easy to be cynical and believe that everybody does it, but in fact very few people lie on their resumes—especially in a tight-knit industry like ours, where word gets around quickly and bad reputations are hard to shake. So it's not only wrong to lie, it's also stupid.

Targeting your resume works best if you learn to read job ads very closely. They might sound formulaic, but most ad descriptions offer important clues about how the employer is going to evaluate candidates.

In the fake ad from Engulfing Arts (p. 35), the main point is clear: The opening is for an artist with some experience doing cartoon style environments who can handle organic modeling. But there are other clues you can infer from the wording of the ad, too. Because the job is designated as "artist," and the ad makes no mention of game design skills, it's a good guess that the team uses a split art/design pipeline, so that the game design skills implied in a job like "level designer" aren't going to be a priority.

"Ability to work well in a team environment," might be Engulfing Arts' boilerplate statement, but it might also mean that previous team members have had trouble taking direction. It might also mean the company uses a top-down, centralized organization. Finally, the description clearly states that the team lumps modeling and texturing together, so it's a good guess that the job will go to someone who can both model and paint textures.

With this information in hand, you should re-work your basic resume skeleton to emphasize the key points the employer is looking for. Most resumes contain an objective that describes the job you want, and a summary paragraph that highlights your skills and accomplishments which are of interest to the potential employer. Use these sections to clearly emphasize your most relevant experience and skills. In the case of our example ad, an appropriate objective might state:

> **OBJECTIVE:** Seeking a position where I can use my experience modeling and texturing with 3D Studio Max with a team to build an expressive fantasy world.

Echo the key phrases of the ad when describing yourself in order to stress how you fit the job on offer. The drawback to this strategy is that it's easy to sound like a marketing drone. If you find it hard to jam all your points into the objective line or summary paragraph, don't forget that the cover letter is a good place to make claims you can't squeeze into the straightjacket of resume convention.

FORMALITIES, NOT CONSTRAINTS

Knowing how much rides on your 20 seconds in the sun, it's easy to drive yourself crazy trying to come up with a format for all of your brilliantly targeted resume data. Do you use a chronological or skills-based format? Can you use color paper or graphics? It's easy to get distracted by the range of trivial choices involved in putting together your life's story. Even if you've been around the block a few times, the business of condensing your whole career onto a single sheet of paper is nerve-wracking. Don't waste a lot of time searching for some mystical *official* format. Books and web sites don't all agree on the proper etiquette, which changes dramatically depending on your field as well.

As an artist, you're not completely bound by the draconian rules of a standard business resume, such as no colored paper, only standard fonts, and so on. However, if you choose to experiment with novel formatting, color, or pictures, remember that your potential reader has a thick stack of resumes to sort through before going home for

STEVE THEODORE *started animating on a text-only mainframe renderer and then moved on to work on games such as* HALF-LIFE *and* COUNTER-STRIKE. *He can be reached at* **stheodore@gdmag.com**.

ENVIRONMENT ARTIST

ENGULFING ARTS INC.
LOS DIABLOS, CA

We are seeking an environmental artist for a multi-platform game. The artist will use 3D Studio Max to build and texture architectural and natural models for a fantasy adventure game with cartoon-style art direction. Two to three years experience in 3DS Max and two years game experience required. Ability to work well in a team environment and under short deadlines a must. Preference given to candidates with strong organic modeling and texturing skills.

dinner. Remember that some designs are more likely to annoy than please that reader. Unusual fonts, artsy paper, and an idiosyncratic layout can help your resume stand out from the crowd, but you have to be 100 percent confident in your graphic design skills if you want to travel that route. If you're not dead certain you can create a visually arresting resume without confusing or annoying the reader, err on the side of simplicity and save your artistic statements for the portfolio.

What you do need to shoot for—and this point absolutely trumps aesthetics—is clarity and a base level of professionalism. The overworked screener on the other end of the transaction is always looking for a good excuse to move on to the next application, and that's just what they'll do if you come off as amateurish or lazy. You need to keep that reader in a receptive frame of mind in preparation for the all-important demo viewing. When you complete your resume, get some friends (more than one) to proofread and copy edit it before you send it out into the cold, cruel world.

THE DEMO

Your portfolio is the core of your job application, the make-or-break opportunity that will (or won't) land you a job. Unfortunately, all the competitive forces that make drafting a resume such a painstaking task are still at play when your reviewer sits down with your samples. For this reason, you need to devote even more energy and time to crafting your portfolio than you do to the details of your resume and cover letter. Finding work is hard work!

The most important skill you need when assembling a portfolio is ruthlessness. You need to be a pitiless critic of your own work; any weak samples that find their way into your demo will drag down the perceived value of your better work. The demo, after all, serves a double purpose for your reviewer. It not only shows the quality of your handiwork, but also demonstrates something of your taste and judgement. Allowing weak items into your collection may cause the reviewer to wonder if you can tell the difference between your best and worst efforts, or whether your better efforts are mainly luck. If you're faced with a choice between fewer samples and a lower average quality, have the courage to cut.

HOW MUCH?

Of course, it's natural to worry about whether you've got enough material, especially when you're busily culling out the weaker pieces. "Enough" is whatever you need to sell a convincing picture of your professional skills to a complete stranger. For a confident, established illustrator, "enough" might be as little as three or four finished paintings. Most of us, though, will want to provide a bit more. How much depends on the medium you use to deliver your work.

Motion media (animations, slideshows, turntables or in-game movies). For motion media, you need at least 45 seconds of material. That might not sound like much, but it's longer than most television commercials and plenty of time to sell yourself. Four minutes is the upper limit. If your reviewer is still wondering how good you are after five minutes, you haven't been sufficiently ruthless in your selection process.

Stills (screenshots, renders, drawings). Provide at least a dozen images if you're going to show stills. If you're delivering images in bulk (for example, a folder of .JPEGs), you shouldn't send more than 40. On a web page, however, you might include more than that, as long as the viewer won't be overwhelmed by facing them all at once. Multiple shots of the same subject—for example, a profile and a full-face shot of the same character—are fine provided they offer the viewer more insight into your work; if they start to seem like padding, though, the net result is probably negative. Large, complex pieces should be presented in ways that each emphasize a different aspect and make the breadth of the piece clear to the viewer. For example if you're submitting shots of a complete game level that you've modeled and textured, be sure to select a variety of detailed shots—too much repetition will make them seem monotonous and may feel like padding to the reviewer.

ANNOTATION

When you assemble your list of images and videos, be sure to provide the reviewer with critical information about the samples. We'd like to think that our work speaks for itself, but often it doesn't. Make sure that the reviewer can easily find the following information for each piece:

- What game is it from, and when?
- If this is a game shot, what was the delivery platform? You don't want your Nintendo 64 shots to be compared to HALF-LIFE 2.
- What part of the work is yours? This is particularly critical for cut-scenes and in-game shots. This is the number one question the reviewer will want to know.

It's also a good idea to include a short, pointed discussion of the design, gameplay, or technical problems you tackled to create the image. A picture of a tank is a picture of a tank—until you say, "I designed this model around a gameplay requirement for a massive vehicle capable of smashing holes in walls to deliver a squad of space marines into a fortified bunker. The huge hydraulic rams serve to emphasize the vehicle's breaching function and visually underline its unstoppable, bull-like character."

Information about how and why you

made the samples you're showing lets the reviewer see your professional skills at work, both in the samples and in your ability to speak intelligently about them. Just don't try to cram too much into the talking points. A sentence or two is sufficient.

MEDIA DELIVERY

Distributing work is somewhat tricky because it's difficult to know what hardware and software your work will be viewed on. The only hard and fast rule is to pay strict attention to all submission guidelines that come with the job ads. Don't send a CD to a company that asks for VHS tapes, or vice versa!

Web page. A well designed, responsive web page lets the resume reviewers click through your email directly to your samples, a convenience that will endear you to them. Plus, through the ease of annotation, you can include notes with your images. As with the resume, don't knock yourself out on the graphic design of your site unless you're really trying to showcase your design skills—and certainly don't take any risks with navigation or scripts that might leave a visitor stranded and annoyed. It's also best to keep Flash or Shockwave components to a minimum unless you're a web specialist and can be confident that your site works well on all browsers and platforms. Vanilla HTML may not be thrilling, but it will be accessible to almost anyone with a computer. The biggest drawback to using a web site as a primary vehicle for your portfolio is that bandwidth and storage costs may make it hard to showcase animations, turntables, or 3D models. Anything that takes more than a few seconds to download is in danger of being skipped by the busy screener.

CD-ROMs. Cheap to make and easy to mail, CD-ROMs excel at distributing large files such as game levels and 3D model source files. You can also use them to distribute images either as individual files or a self-contained HTML web site. If you use standard image formats (.JPEG, .TIFF) and HTML or plain text notes, burn your CD as ISO-9660 format to make it work on Macs, PCs, and Linux systems. Unfortunately, animation and video files that depend on downloadable codecs or rely on system resources can easily cause trouble between different operating systems. MPEG-1 (VCD) and MPEG-2 (DVD) formats are cross-platform but not trivial to author. If you create a VCD or DVD format reel, be sure to test it on both computer and consumer DVD players.

VHS tapes. You might prefer to deliver motion materials (especially animations, but also game footage and turntables) on VHS tape. Until a few years ago, VHS was the standard way to distribute demo material, and many companies still demand VHS as the only submission format. It's a reliable way to distribute motion media, but it's a poor way to demonstrate stills, detailed textures, or model wireframes. It's also unfortunately true that many companies don't have a VCR, so blindly sending a VHS tape would be a waste of time and postage.

BUCKLING DOWN

In the battle-scarred wastes of the job search, it might seem like this is a lot to go through for a simple job application, but almost every rule can be reduced to two simple ideas: 1) don't give the reviewer an excuse to fail you, to move on to the next candidate, and 2) carefully edit every part of your application, from the cover letter to the notes accompanying your portfolio, to reinforce your fitness for the job on offer. If you remember those two points, the rest follows logically. There's no question it can be a lot of work, but if you buckle down to the hard work of job-hunting, you'll be at a real job a lot faster than the applicants who skimp on it.

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ALAN YU

BUSINESS LEVEL

THE 100 DEVELOPER CHALLENGE

AT ELECTRONIC ARTS LOS ANGELES (EALA), like most other studios in our industry, we're preparing for the transition to the next generation of game development. Developing new games for new hardware requires a change in the work cycles. So although the concept of the next generation brings to mind flashy terms such as "high definition, multiprocessing, and realistic physics," we also need to focus on frameworks, better processing, and tangible talent-management systems—the less sexy terms that enable our businesses to function properly. Sure, they're not flashy, but those terms will be central to the success of the industry at large as we move forward.

THE DRAWING BOARD

Recently, EALA began to address these issues of next-generation process and scheduling for the first time: A team of more than 100 developers has just shipped MEDAL OF HONOR: EUROPEAN ASSAULT, and they all will take some much deserved time off to recharge before returning to work. The plan seems pretty sound, but the timing didn't work out very well as EALA currently has several games in concept development and pre-production stages, but none of them are quite ready for full production.

What's delaying these projects is one of EALA's core studio principles: hold and iterate with discipline before scaling and advancing from development to production. In other words, we don't throw people onto development teams until we clearly know what they're going to build. Anyone who's been in the industry a modicum of time has heard horror stories about scaling teams too quickly and the inevitable chaos and confusion that ensues—wasted work, diffusion in ownership, and general frustration. This is problem is especially prevalent in larger studios that develop multiple titles at a time. EALA has certainly fallen victim to this in the past, and we're determined not to again.

CELLULAR PLAN

When we were deciding what to do with developers who were awaiting their next project, we looked for a solution that would 1) allow them to channel their passions, 2) incubate new ideas, and 3) bring them meaningful work despite being between projects. We came up with The Invention Project (TIP).

What if each person in the entire studio could submit their ideas for invention and innovation in any one of four categories: people/culture, process, product/creative, and technology? We could gather the submissions and allow them to be juried by leads in the studio. Some ideas would be selected for production. And we would assemble "cells"—small groups of maybe 7 or so people—to tackle each new idea selected for production.

So when we launched the project, the first group we invited to try it out was the returning members of the MEDAL OF HONOR: EUROPEAN ASSAULT team. They divided into cells with the goal to originate small inventions that could, over time, inspire original design concepts and alternate ways of thinking at EALA.

In about four weeks, TIP generated more than 200 submissions. Here's a small sampling:

Title: Lessons in the wrapper/UI
Goal: How do we improve the way we focus on the wrapper/UI development?

Title: Procedural map feasibility study
Goal: Determine the feasible ratio of automation versus manual input in the generation and decoration of compelling, large procedural environments.

Title: Studies in subtitles
Goal: Design a subtitle system that looks good, provides excellent readability, and works in a game environment where dialog timing is not always predetermined.

Title: People-watching classes
Goal: Develop and fine-tune EALA artists' abilities to translate real-world human movement and emotion into a game environment.

THE TIP-OFF

At its heart, TIP is an idea incubator informed by many influences, among them, Will Wright's philosophy of organizational structures, and a desire to keep teams as small as possible during early stages of development.

Why would EA carry out this plan when it doesn't generate revenue for the company? Well, if things go as planned, TIP will generate money. The studio treats TIP just as it would any other project on the SKU plan, and intends to use the output from the project in games or other profitable studio initiatives.

By the time you read this, TIP will be well underway. Cells will be tackling some of the 200 proposals and preparing for the first ever EALA Invention Festival, a showcase of output and findings. So, as we move into the next generation of video game development, EALA will have its own little next-gen science fair to boot.

ALAN YU *is a director of studio artist and repertoire at Electronic Arts and previous employee and director of the Game Developers Conference (1995–2004). You can reach him at ayu@gdmag.com.*

ALEXANDER BRANDON

AURAL FIXATION

GAME AUDIO ACADEMIA

AS THE CHAIRMAN OF THE GAME AUDIO Network Guild (G.A.N.G.)'s Education Committee, I suppose it was only a matter of time before I wrote about the subject of game audio in schools around the world. Believe it or not, it's a subject screaming to be written about.

SCHOOLHOUSE ROCK

Take a quick flip through the back pages of the very magazine you're holding. You'll notice there are a number of schools advertising their degree programs or courses. Schools across the country and indeed around the world recognize that the game industry is not only big, but chock full of rapidly changing information that needs to be delivered in any number of proper ways. You'll see programs for animation, art, design, production, and engineering. What you will not see are many programs specifically for game audio. Why not?

WE'RE NOT GONNA TAKE IT

Progress is being made, but it isn't being made fast enough. Game audio is now a massive subject and could certainly be made into a bachelor's degree program at the very least. Each major platform can encompass weeks of study, with the varied capabilities of each, in terms of perfecting the art of squeezing data and content into the next big product using precious little memory and space.

On top of that, there's a huge difference in how game and film audio are produced, and the necessary considerations for implementation of both. Add the marketing aspects of licensing and techniques for lining up the proper talent to promote more sales and you have yourself a cave full of game audio skill set treasure.

The progress that is being made to get game audio into schools began long before G.A.N.G. was founded. In the early to mid 1990s, game audio giants such as George Sanger and Tommy Tallarico were speaking at universities and trade shows, roomfuls of students and colleagues eager to learn what the veterans had already suffered through. This process is still going on. For example, I have seen lecture announcements for the UK-based School of Audio Engineering, Islington concerning game audio. In addition, I had the honor of being invited to speak at Texas State University two years ago as a guest of the Audio Engineering Society. Last year thanks to Jeannie Novak, I spoke at UCLA. For each event, about 20 people showed up and there was fire in every one of their eyes. Soon, Paul Baker will also be lecturing at the University of Texas, Austin, I'm betting to an even larger group of students.

STAIRWAY TO GAME AUDIO

Lectures are all well and good, but they're not well documented in a single source. There is also vast room for degree programs, and these two initiatives are the next goal of G.A.N.G.'s Education Committee. A first major step toward these goals was taken at this year's GDC when the first game audio scholarship was awarded to Nick Zellers. Thanks to the hard work of Todd Fay (G.A.N.G.'s Director of Development), and Yee-Ju Riddell (Ex'pression College's Director of Admissions) Nick will be awarded an entire semester at the Ex'Pression College of Digital Arts Sound Arts program. In the future, we hope there'll be programs like this at many other institutions of higher learning.

FINAL FANTASY **series composer Nobuo Uematsu speaks at a GDC roundtable.**

SITES

www.audiogang.org
Your one stop shop for a game audio community. Forums, white papers, awards shows, committees, the list goes on.

www.iasig.org
Launched years before G.A.N.G., the SIG seeks to better the technical aspects of game audio and interactive audio in general (yes, it does exist outside games—websites and art, for example).

GAME AUDIO BOOKS

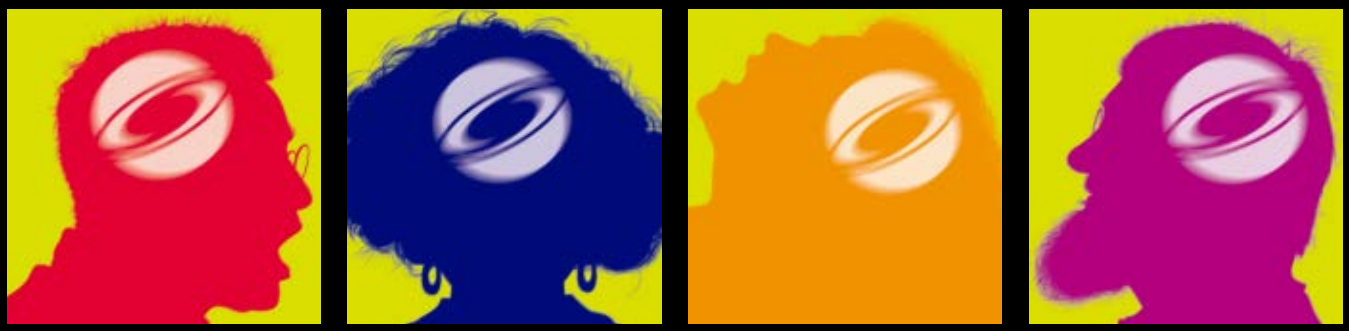
Until lecture schedules are posted, literature linked, and degree programs started, here's a list of educational sources to go to about game audio (also see *sites* sidebar):

The Complete Guide to Game Audio *(CMP Books, 2001)*
Author: Aaron Marks
This was the first book written about game audio and contains as comprehensive a beginner's guide to the subject as you could hope for.

The Fat Man on Game Audio: Tasty Morsels of Sonic Goodness *(New Riders Publishing, 2003)*
Author: George Alistair Sanger
This is my bible on game audio. It contains technical information on some very innovative composition methods, integrator talk, but best of all it has harnessed the great community and camaraderie that was the early years of game audio and makes you ask questions that reach deep.

Audio for Games: Planning, Process, and Production *(New Riders Publishing, 2004)*
Author: Alexander Brandon
Though I say it myself, my own recently-published writing is a competitive intermediate level game audio book. It delves into laying a foundation for pretty complex audio development for the ever-increasing audio team on major products.

ALEXANDER BRANDON *has been involved with game audio since 1994 and is currently the audio manager at Midway in San Diego, Calif. You can email him at* ***abrandon@gdmag.com****.*



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NOAH FALSTEIN

GAME SHUI

FAMILIAR, YET DIFFERENT

THIS COLUMN'S UNDERLYING THEME IS an ongoing exploration of important guidelines for game designers, which cumulatively are part of The 400 Project. But from time to time, it diverges a bit to touch on other issues important to designers, breaking the pattern, veering from straightforward expectations to bring up something new to ponder in our field.

And that principle of mixing the expected and novel applies to not only monthly magazine columns, but also game design. Our rule this month:

MAKE YOUR GAME FAMILIAR, YET DIFFERENT

Nearly all popular games blend familiar elements with novelty. This rule, generally applicable to all games and well known by game developers, is so general that it's tough to use as a practical design principle. When selecting rules for The 400 Project, one guiding principle I use is to look for rules that have practical utility, as there are vague truisms like "make it fun" that certainly apply to games but are so nebulous as to be useless as workable guidelines. But I'm stretching the principle this month because although the familiar/different rule is hard to specify, it can be helpful even to prompt analysis of your own game design.

GRAND THEFT AUTO: SAN ANDREAS **delivers some new elements while retaining the familiarity of its predecessors.**

I'm a firm believer that games are ultimately about learning, which helps explain part of why this rule holds true. We need a game to be familiar enough so that it's accessible, so we can understand enough of the context, goals, and interface to make sense of what we're supposed to do—otherwise, we don't make any progress. And we need some novelty, too, or there's nothing new to learn or experience and the game becomes boring. Accordingly, the familiar/different rule is complementary to the May 2004 column, "The Flow Channel," which described a game as a progression of increasing challenges, weaving between the twin hazards of being too complex and frustrating, or too simple and boring. Familiarity helps prevent frustration arising from complexity or obscurity, and novelty guards against boredom.

FAMILIAR SURROUNDINGS, DIFFERENT EVENTS

Sports games, driving games, modern military battles, and other simulations of the real world have a greater burden of familiarity. Games of this sort often have very familiar surroundings, rules, and images, and many times have proven the financial value of licensing major sports franchise names, individual famous players, coaches, or managers. [See Dan Lee Rogers' "Playing Smart With IP," page 17.] But the differences are present in the specific events and outcomes: Who will score the winning goal? Which strategy should I choose this time? Should I accelerate to pass this car before the curve, or slow down and try to cut inside? Should I go around this building or try to climb over it?

DIFFERENT SURROUNDINGS, FAMILIAR ACTIONS

Fantasy or science fiction games, on the other hand, specialize in exotic settings. To balance the novelty of the setting, the actions one takes tend to be familiar, including exploration, combat, and resource management. Conventions for settings arise quickly and become familiar by repetition; and like settings, characters can become conventional, too. Elves, dwarves, and ogres are fantasy characters and conceivably could have any range of qualities, but most fantasy-genre players have come to expect an elf to be quick and agile, a dwarf to be small but tough, and ogres to be massive and powerful. The stories in games are often full of stereotypes and overly familiar situations as well—but then, so are many of the stories in popular novels, films, and TV shows (called stock plots). People appreciate that sense of familiarity, and in games, the burden of the novelty is often more on the interactivity and gameplay than in the story or setting.

Often in an established genre—like first-person shooters, real-time strategies, or flight simulators—the interface is dictated by convention. Once players gain competence in a specific combination of button presses and joystick movements, learning a new interface is hard and can be frustrating. The burden of finding something different in these games falls to the visual effects, graphic design, and/or level design.

INNOVATE AT YOUR OWN RISK

In this industry, we (developers) award innovation. But the mass market, with its pocketbook full of purchase power, tends to reward familiarity more—witness the huge preponderance of sequels and titles licensed from movies or sports franchises. Eventually, even the biggest redwoods of game franchise tend to decay and fall, leaving room for replacement, but often those replacements are offshoot games based on previous modest-selling ones (like the first WARCRAFT or GRAND THEFT AUTO), or games based on new hit movies. And yet, without that occasional ground-breaking step, the entire games industry risks stagnation.

It seems clear that there's considerable room for variation concerning just what part of a game must remain familiar and what part should be new. Do you have a winning formula, or have you discerned a consistent pattern in hit titles? Email me and I'll quote the best examples in a future column.

NOAH FALSTEIN *is a 25-year veteran of the game industry. His web site,* ***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. Email him at* ***nfalstein@gdmag.com****.*

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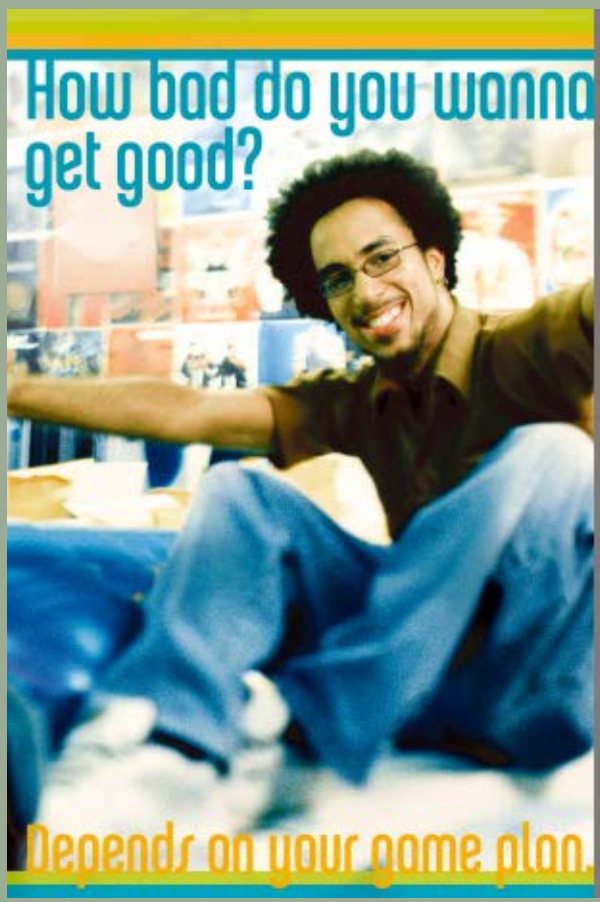

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by Rick O'Connor

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CORRECTIONS

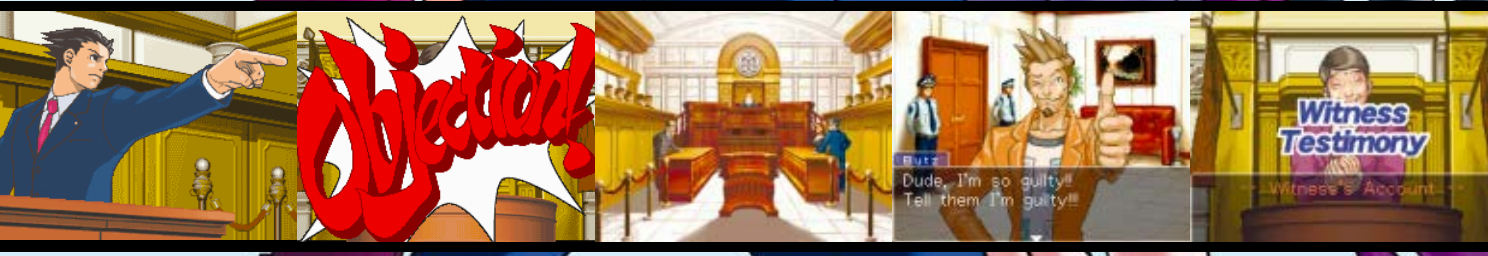
MAY 2005, BUSINESS LEVEL COLUMN

In the May 2005 Business Level column by S. Gregory Boyd ("Why Prior Art Matters"), we misstated what Ralph Baer's Pong patent covered. The patent included concepts licensed for Atari's Pong, not prior art.

APRIL 2005, AURAL FIXATION COLUMN

In the April 2005 Aural Fixation column by guest columnist Zak Belica ("Sound Principles: Voice Direction"), the given title of Legacy Interactive's game was merely its working title. The formal title is ER: The Game Based on the Hit TV Series.

Game Developer magazine welcomes comments and corrections on our content. Please address these via email to editors@gdmag.com, or via postal mail to Game Developer, CMP Media LLC, 600 Harrison Street, San Francisco, CA 94107.



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