



United Business Media

▶▶▶ **PRODUCT REVIEW** MUDBOX 1.0.7

JUNE/JULY 2008

# gamedeveloper

THE LEADING GAME INDUSTRY MAGAZINE

▶▶ **MASSIVELY MINI**

FREE-TO-PLAY EATS  
YOUR SUBSCRIPTIONS

▶▶ **INTERVIEW**

GRASSHOPPER'S  
MASAFUMI TAKADA

▶▶ **THE GOOD FIGHT**

COMBAT AI LESSONS  
FROM 3D BRAWLERS



**POSTMORTEM:**  
**SQUARE ENIX'S:**  
**FINAL FANTASY CRYSTAL CHRONICLES**  
**MY LIFE AS A KING**



**CREATE**

In *Assassin's Creed*, Ubisoft used Autodesk® 3ds Max® software to create a hero character so real you can almost feel the coarseness of his tunic.

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**HOW UBISOFT GAVE  
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## POSTMORTEM

### 34 SQUARE ENIX'S FINAL FANTASY CRYSTAL CHRONICLES: MY LIFE AS A KING

FINAL FANTASY CRYSTAL CHRONICLES: MY LIFE AS A KING was a WiiWare launch title in Japan, and sits somewhere between a strategy game and a god game. In this technical-oriented postmortem, lead programmer Fumiaki Shiraishi shares the ups and downs of implementing scripting for designers, the benefits of small file sizes, and the trouble with overblown AI.

*By Fumiaki Shiraishi*

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Smaller, non-subscription MMOs have been slowly but surely making their way into the hearts and minds of the game community. But now, they're getting too big to ignore. Are tiny MMOs eating away at your subscribers? Michael Zenke here discusses the scope and influence of these new arrivals.

*By Michael Zenke*

### 15 INTELLIGENT BRAWLING

Those who don't learn from history are doomed to repeat it, and with that in mind, Tom Smith dissected the enemy AI of several competing 3D brawlers in order to discern what makes for intelligent looking enemies. The results are intriguing, at the least, and show what there is to gain by putting a magnifying glass to the work of others.

*By Tom Smith*

### 42 INTERVIEW: MASAFUMI TAKADA

Masafumi Takada is the director of sound for Grasshopper Manufacture (KILLER7, NO MORE HEROES), and has worked for several other companies, including Sandlot (EARTH DEFENSE FORCE series) and Clover Studios (GOD HAND). Here, Takada reveals the rather conventional origins of his unconventional audio.

*By Brandon Sheffield*

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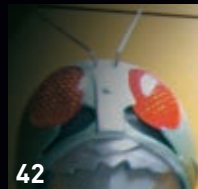
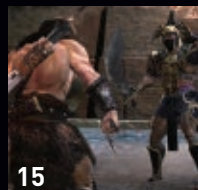
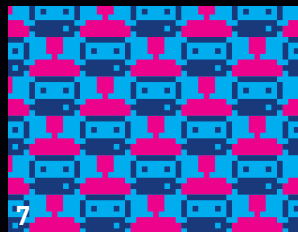
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## THE HARDCORE NICHE

**THE VIDEOGAME MARKET IS CHANGING INCREDIBLY** quickly right now, probably the fastest it has since the big crash of the mid-1980s. Not only is the market expanding to include women and casual gamers once again, the definition of what constitutes a "game" is expanding. It's not really expanding within the minds of game developers, I wouldn't say, but it is in the context of the mass media and mass consumers, and that's who drives the market in the first place. As sick to death as we all are of talking about microtransactions, free-to-play MMOs, and casual online spaces, the advent of these things is changing the game landscape for good, whether we like it or not.

### INTERACTIVE MEDIA —AT FACE VALUE

The lines between an online community portal and an MMO are blurred to the point of being indistinguishable. Consider the numbers—AUDITION ONLINE has tens of millions of users worldwide, and a dedicated TV show in Vietnam. KART RIDER has tens of millions of users. Ditto HABBO HOTEL and CLUB PENGUIN. Traditional games—like most people reading this are developing today—may never be able to reach that large of an audience. Our games are too focused, too hardcore, and bear too much of the stereotype of "gamer."

Right now, HALO 3, GTA IV, and WORLD OF WARCRAFT are considered our blockbuster titles, and flagships for the industry in popular culture. But when you think about it, it's still just shooting aliens, playing gang banger, and swinging your sword in the forest. Boiled down to their essentials those things appeal to a very limited group of people, and the complexity of game controls prevents even blockbuster movie attendees, whom we should be attracting, from playing these things.

At least that's the common line. But is that really the case? Do aliens, wizards, and soldiers really make a piece of entertainment inaccessible? Multiple millions of people went to see the *Iron Man* movie this past month, and a large percentage of them have probably never picked up a comic book in their lives. Why is it that people will go see *The Lord of the Rings* movies, but not play the games?

### THE REAL MASS MARKET

It's common knowledge that game controllers are intimidating, that consoles have a certain

stigma to them, and that most mass-market consumers consider games to be either a waste of time, or actively detrimental. These can all be debated until the end of time, but the perception exists, and either that has to change (Nintendo is doing good work there), or we have to change. Otherwise we'll end up with a comparatively small fraction of a growing market.

Will it be possible to make a game like ASSASSIN'S CREED or BIOSHOCK in 2015? It's already becoming difficult to justify large budgets for single-player experiences, and it stands to reason that it will get more difficult as time goes on. What does that mean for developers of these games? What happens to the concept of a game auteur? One possibility is for these hardcore games to essentially become the art-house cinema of the videogame world, which would be odd, as that's a role currently filled by indie titles.

Interestingly, never has the film/game analogy worked less well than it does currently. In the PS2 era, you could correlate GTA III with a movie blockbuster, and ICO with an art-house film. But now, in terms of scope, money, and global social impact, KART RIDER or CLUB PENGUIN would be that blockbuster, and CALL OF DUTY 4 would be the art-house equivalent, though content- and budget-wise CALL OF DUTY 4 is much more your traditional blockbuster material. Something seems awry there.

The fact is, these simple-to-play social experiences are here. They're growing in popularity, they're dwarfing our multi-million dollar projects that sell through to 5 million people at max, and they cost a fraction of the price to make. With the market expanding as it is, and the dollars going where they're going, the \$20 million budget bestselling console title of today is going to be the hardcore niche title of tomorrow, art-house or not. Unless development costs get significantly lower, it seems we have an online future to look forward to.

### NEW THINGS ARE STUPID

In a way, this editorial is a companion piece to the one I wrote last September. To wit: online games are taking over, and I, curmudgeon that I am, don't really like it. Certainly there will always be the hardcore players that will want that deeper experience. There's no doubt about that. But the question is—in an industry where we're getting our asses kicked financially by web developers, of all people—who will pay us to make it?

—Brandon Sheffield

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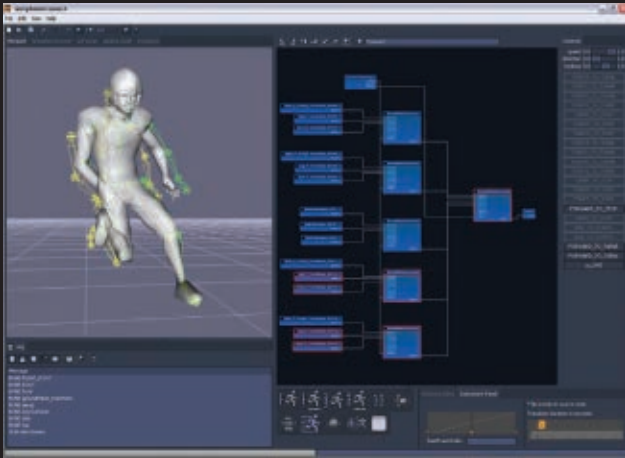
advanced animation system

morpheme is the industry's first graphically authorable animation engine. morpheme consists of morpheme:runtime: an advanced runtime animation engine for PLAYSTATION®3, Xbox 360™, Wii™ and PC. morpheme:connect: a highly-customizable 3D authoring application.

morpheme gives animators and developers unprecedented control over the look and feel of their animations in-game: blends, transitions, compression, etc. can all be previewed and modified graphically in morpheme:connect and live on the target platform.

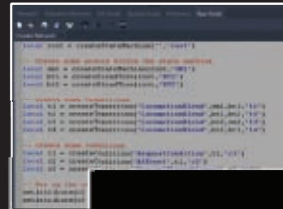
morpheme:runtime ships with full source code and integrates seamlessly with euphoria, NaturalMotion's Dynamic Motion Synthesis technology.

For more information, visit [www.naturalmotion.com](http://www.naturalmotion.com)



## scripting

Full Lua scripting for automating tasks, adding AI logic or polling game pads for real-time input



## timeline

Graphical mark up of animation data to add one-shot and duration events, for highlighting footfalls, sound effects, etc.



## node palette

Advanced blend notes for dragging and dropping into transition network. Fully customizable node types through C++ and scripting



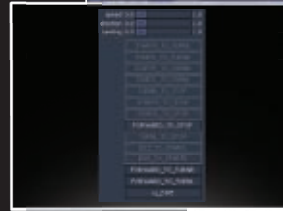
## animation browser

Easy browsing and selection (drag & drop) of source animation. Animation list is automatically updated to reflect changed source files



## transition requests

Exposure of custom transition messages. In-tool emulation of interaction between morpheme:runtime and game AI system



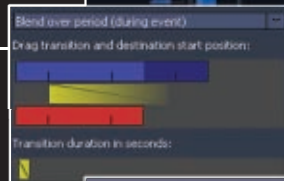
## blend tree

Advanced graphical tools for building complex blend trees. Real-time visualization of animation source contribution through node highlighting



## blending

Graphical control of transition blending between states in the transition graph



## multiple characters

Visualization of multiple runtime characters in morpheme:connect for easy authoring and analysis of character interaction



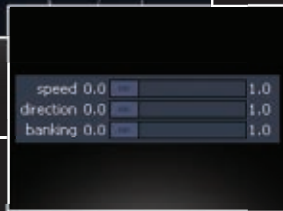
## network

Advanced graphical tools for creating and visualizing transition networks through drag-and-drop

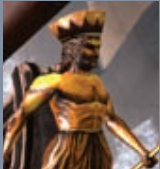


## control parameters

Exposure of custom high-level controls for entire animation system. Real-time manipulation through sliders or game pad controller



## DEVELOPER FIRST-PERSONS



### Mark Sutherns

**Associate Producer  
of Empire: Total War**

on the boundary between realism and playability in a game that prizes historical accuracy.

"It's something we do have to compromise on at times, because we need to make sure that the faction colors are bright enough and clear enough that people know who's who on the battlefield. So you'll get some of our fans who say 'Oh the uniforms aren't realistic. That wasn't red on that troop type, or that wasn't as large as it was on that troop type.' The reason we make these changes are purely for gameplay, to make sure the player can identify troops. So we do have to make some compromises on the uniforms.

But the weapons—musket fire, rate of fire, accuracy, reload times, we're modeling them as realistically as we can, but again within the realms of gameplay. You don't want to be two minutes before you can fire the gun in the game, we need to compromise on that somewhat. But we want to model the fact that untrained troops just won't reload as fast as trained troops. So what we're going to have is if you've got one unit, and he's up against an identical unit, but this one is more trained than that one, he'll kill more through accuracy, and he'll load faster as well. So that is realistically modeled, but with elements of gameplay brought in to make sure that it's not tedious."



### Hideki Kamiya

**Director of Bayonetta for  
PlatinumGames**

on his perceived stagnation of the 3D action genre.

"Since I created Devil May Cry seven years ago, there hasn't been a lot of change. Just copycats, and sequels, and things like that. The genre itself hasn't changed enough. So I'm hoping to use my experiences from the last seven years, along with lessons from what the games that have come out did well and didn't do well, and really bring something different. I mean, my experiences over the last seven years have changed me—the genre should change as well. Action games shouldn't be like this—I want to do something more.

With subsequent games that have come out, there's some sort of fan expectation that exists, and so that places some limitations on what the developers can do with a game series. With [PlatinumGames' upcoming title] Bayonetta, there are no such restrictions, and there's nothing it's based off of. But I think that those fan-oriented games still didn't really give the fans something interesting to play, even though it tried to appeal to them directly. That's my aim."



### Patrick Redding

**Narrative Designer on Far Cry 2 for  
Ubisoft Montreal**

on his team's trailblazing open world dynamic narrative delivery system.

"In a game like Far Cry 2 ... we don't know where the player is, we don't know what direction he's traveling in, and he literally could have assassinated one of the main characters in the last mission. All of these elements make the way the story unfolds potentially extremely dynamic, and if we had tried to not support that dynamic approach, we would've ended up with a story that just felt like it was progressing along, more or less independently of player action, as though the player had no ability to affect its outcome. And we felt like there was no point in doing that.

We felt like if we were going to pretend to support some sort of narrative component to the game, we really needed to make sure it was systemic narrative—what we call dynamic story architecture, which takes large banks of content, chops it up into very small pieces, and has the system deliver those pieces in a way that reflects the current state of the game's world. That sounds like a complicated thing, and sometimes it is insanely complicated, but there's a simple underlying idea there, which is that rather than having an enormous tree of dialogue or a huge branching structure where basically we can guarantee that a typical player only sees 10 percent of what we've created, why don't we instead try to pick the right pieces; figure out the right way to break down a dialog, or an animation, or a scripted event, so that we can reuse as much of that content as possible, and make sure that it can be used in lots of different locations, with lots of different NPCs."



### Nolan Bushnell

**Founder of Atari and uWink,  
and NeoEdge Chairman**

on why he's targeting casual games.

"The market, when people talk about the size of the video game market, they're talking really about the habits and the money of 15 million people in the United States. That's basically 85 percent of the console game market. So if you look at the numbers, casual gamers right now are 40—but should actually probably be closer to 100 million. I'm trying to get back to the number of game players that existed basically in the '70s. In 1979, 40 percent of the population—250 million—self-identified as a game player, meaning that they'd played a video game within the last week.

When you look at that, you say what happened? I say: Games got violent, and lost the women. Games got complex, and lost the casual gamer. So now we're starting to see those come back, and I believe that that market size will actually get bigger. So the old story says that if you want to lead a mob, figure out where it's going, get out in front, and say 'follow me.'"



# MMOS BY THE NUMBERS

## IN ITS FIRST-EVER QUARTERLY ONLINE GAME

subscription tracking report, which covers October 2007 through March 2008, the NPD Group has gathered data claiming that online subscriptions, including MMO, casual, and console titles, represent over \$1 billion annually to the U.S. gaming industry.

The NPD Group calculated these results by taking the monthly averages it had estimated from a newly compiled gamer panel for Q4 2007 and Q1 2008, respectively \$94.3 million and \$80.1 million, and multiplying the average of those two by 12 to get the annualized equivalent.

Said NPD spokeswoman Anita Frazier: "Now that NPD can estimate the value of the subscription market, it's clear that there is a sizable chunk of revenue being generated by PC gaming beyond what is reflected in retail sales."

The online subscriptions tracking report went on to propose that 11 million North American gamers hold monthly subscriptions to online games. According to the report, revenues from console subscriptions rose 9 percent on an average monthly basis since Q4 2007 to Q1 2008.

The NPD Group also listed its own estimates of the top 5 rankings for MMOs and gaming subscription (largely casual) websites during the Q4 2007 to Q1 2008 period.

Said Frazier: "While the majority of gaming website players are females over the age of 35, MMOG players are largely males under the age of 35. The variety of content available to play games on the PC clearly can draw a diverse audience."

—Eric Caoili

## MMO/PC GAME SUBSCRIBERS:

- WORLD OF WARCRAFT
- RUNESCAPE
- LORD OF THE RINGS ONLINE
- FINAL FANTASY XI
- CITY OF HEROES

## GAMING WEBSITE SUBSCRIBERS:

- POGO.COM
- REALARCADE.COM
- BIGFISHGAMES.COM
- GAMETAP.COM
- DISNEY.COM

# TERRAFORMING VIRTUAL WORLDS

## HENK ROGERS INTRODUCED JAPAN TO THE RPG IN 1984 WITH HIS GAME

BLACK ONYX. In 1989 he secured the console publishing rights to TETRIS and hand-held gaming hasn't been the same since. Now teaming up with Kazuyuki Hashimoto (FINAL FANTASY VII, *Final Fantasy: The Spirits Within*) and Li-Han Chen (EVER QUEST II: EAST, *Final Fantasy: The Spirits Within*), Rogers is masterminding Avatar Reality, a Honolulu based company that is using Crytek's CryEngine 2 to build a new MMO called BLUE MARS. The game's terraformed Martian landscape has given Rogers an opportunity to bring a broad range of environmental ideas to the design table. From ecology to urban planning, Rogers wants virtual worlds to reflect the real-world concerns of the people inhabiting them.

"The idea of doing it on Mars is something that I think has to be done anyway and I'd like to get people used to the idea of colonizing Mars. We have to have a backup of life on Earth. We don't know why all the big extinctions happened on this planet in the past. We think the dinosaurs were wiped out by an asteroid but there are many other extinctions that have happened for other reasons that we're not comfortable with yet," he told us.

"The earth is a very fragile place. In the computer business you always make a back up. We have to make a back up of life on earth. And the cheapest and easiest place to make a back up is on Mars," Rogers said. "The moon just doesn't have enough gravity to hold an atmosphere and protect us from solar radiation, but Mars does. It may not have as much to retain it by itself, but we can augment it by adding atmosphere. We know something about global warming, so if that's all it takes, we've got that one down."

Rogers looks to his home environment of Hawaii for inspiration as the deserted lava flows of the Kona coast are transformed into lush resorts and condominiums. "You can actually see terraforming happening there. They take the top layer of rock and grind it down to make soil and make golf courses out of it. Where the shore used to be all rock, now it's gigantic resorts with palm trees and every kind of vegetation," he said. "It only gets six inches of rain per year, it's like a desert. When we go to Mars we have a similar situation. We basically have to create where we want to live. We're already doing this today on this planet, so I'm thinking that's exactly what is going to happen on Mars," Rogers said.

Virtual worlds can be garish and chaotic places. However, by placing BLUE MARS in an already existing environment Rogers wants real-world design principals to govern its creation. "In shopping centers the escalators move at a certain speed, the distance between the steps is decided, how wide everything is, how fast everything moves, this is all figured out before they even build it," Rogers explained. "What we're looking to do is give other companies the opportunities to build cities, and each city will have its own set of rules about what you can and cannot do in that city. We won't decide that for the entire world, that's up to our tenants. So the tenants will compete, maybe some cities will be a post apocalyptic city, or a beautiful paradise city. We're not going to dictate that. All we're going to dictate is that they have some way of vetting all the stuff that goes into the city, so that it's not a garbage collection. Cities are ultimately competing for people. They'll be competing by having better attractions, they'll be competing by having better neighborhoods and a better mix of people who live there, all these things that normal cities compete on," Rogers said.

—Jeffrey Fleming

## CALENDAR

**Dr. Dobbs Architecture & Design World 2008**  
Hyatt Regency McCormick Place, Chicago, IL } July 21–24  
Price: \$2295 } [www.drdobbsarchworld.com](http://www.drdobbsarchworld.com)

**Casual Connect Seattle**  
Benaroya Hall, 200 University St, Seattle, WA } July 23–25  
Price: \$600 } <http://seattle.casualconnect.org>

**12th International Conference on Computer Games**  
Galt House Hotel, Louisville, KY } July 30–August 2  
Price: \$450 } [www.cgamesusa.com](http://www.cgamesusa.com)

## CORRECTIONS

In the May 2008 issue of *Game Developer* we stated that Ensemble's HALO WARS utilizes Unreal Engine 3—in fact, the engine is proprietary. In addition, we neglected to note that Vicious Cycle's Vicious Engine 2 offers 3ds Max and Maya integration, but does not offer Wii support. The editors regret the errors.

—Staff



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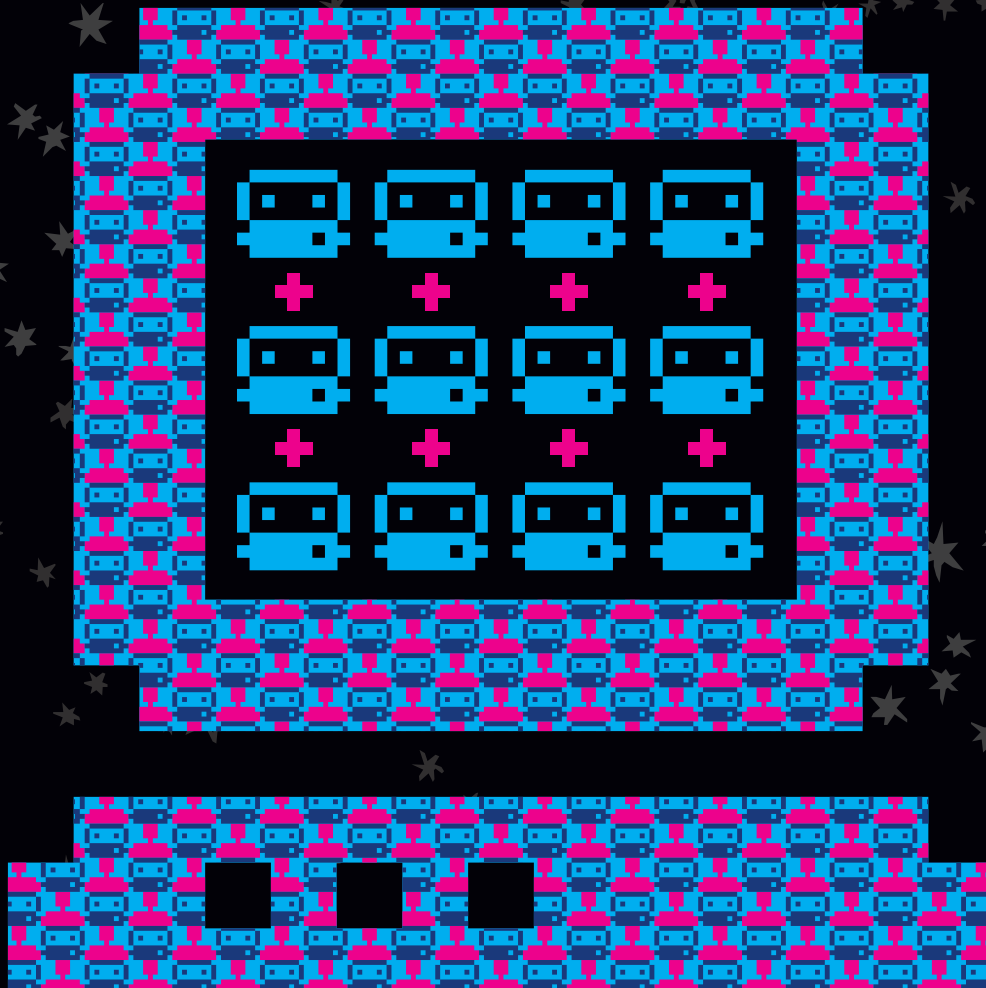


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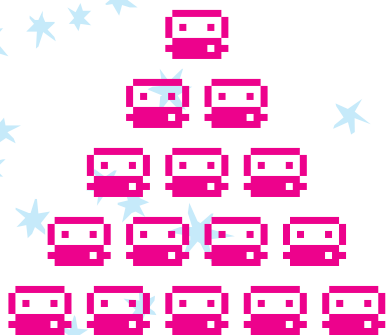


>> michael zenke



# LAND OF THE FREE:

## THE RISE OF THE TINY MMO



**MICHAEL ZENKE** was games editor for *Slashdot.org*, and is now a lead blogger at the Joystiq network's *Massively.com*. His personal views on MMO gaming can be found at *mmogation.com*. Email him at [mzenke@gdmag.com](mailto:mzenke@gdmag.com).

✦ **THE PUBLIC PERCEPTION OF THE MASSIVELY MULTIPLAYER** genre is shaped almost entirely by a handful of fantasy subscription titles. The vast majority of the western media—and many developers—believe that orcs, elves, and millions of dollars in development costs are required to succeed in the MMO marketplace. This viewpoint, if it was ever accurate, is now so outmoded as to be actively detrimental. Understanding the modern business of virtual worlds and massively multiplayer online games requires a different perspective and hard numbers. Both are challenging to obtain.

As official statistics from publishers and developers are so hard to come by, it's necessary to stand in publicly accessible information to judge the success or failure of a virtual world. Here, we'll use forum thread counts and statistics from the Alexa and Compete web sites to ascertain a game's popularity. Alexa aggregates data from multiple sources, including traffic from individuals with the site's toolbar installed, while Compete's count is gathered from observing a specific group of web users' surfing habits to calculate a web site's unique monthly traffic.

These numbers, even without an official seal, can shine light on a surprising reality. Titles many consider to be 'small fry' ventures are in fact enormously popular; worldwide some even far outpace any title that requires a subscription fee. Activision CEO Robert Kotick's much-repeated pre-merger



statement about what he thought it would take to make a 'WORLD OF WARCRAFT-killer' is pointed: "Even if we were willing to invest the \$500 million it would take to just get to a standstill with Blizzard, it would result in declining operating margins and huge risks." His statement also completely ignores the potential of the market.



Nexon's MAPLE STORY.

Market trends indicate that what will ultimately provide the next disruption to the online gaming market isn't a single mega-funded title. Instead, a proliferation of specifically targeted games will eat away at (or supplement) the current market leaders. The key is that these 'smaller' games can offer specific experiences comparable to a AAA title for a fraction of the price (both in development and consumer costs). Social interaction is the easiest niche to enter, but other genre areas previously requiring huge amounts of capital to conquer will soon be within the purview of one-to-five million dollar projects.

## MAPLE MACRONOMICS

Arguably the best example of this market disruption is Nexon's stable of games. Originally released in the United States in 2005, Nexon all but pulled the side-scrolling fantasy MAPLE STORY from US shores because of a lack of consumer interest. By the summer of the following year, market conditions had changed enough to tempt them back. Today Gamestudy.org estimates that MAPLE STORY has more than 3.5 million players on the North American servers, and over 60 million worldwide. Nexon just completed a North American beta test for its casual-friendly racing service KART RIDER, and launched the fantasy RPG MABINOGI into the US market in April of this year. English-language forum thread counts for the company's games are one of the clearest signs of success in this marketplace: the singing title AUDITION, which Nexon publishes for T3 Entertainment in North America, bears up under

some 119,000 discussions, while MAPLE STORY staggers under the weight of over 240,000 threads. AUDITION's forum interaction is especially notable, as the company claims it has attracted "only" 100,000 unique users in the North American market. Comparatively, NCsoft's most recent financial release pegs the subscription numbers for the CITY OF HEROES title at 136,000 players.

AUDITION's statistic comes from the summer of last year, so the numbers may have grown since then. AUDITION's success and the recent KART RIDER Beta are signs of the times. At this year's Independent MMO Game Developer's Conference, RebelMonkey cofounder Nick Fortugno pinned Nexon's KART RIDER as "the most important game in the genre." Fortugno, the developer behind the wildly successful DINER DASH, gave a presentation on the casual view of online gaming. In that discussion he mentioned that Min Kim, Nexon's head of North American operations, has made regular trips around the country to talk about KART RIDER's success. According to Fortugno, the company's free exchange of information stems from the fact that they "just don't care ... It strains the imagination how successful that game is for them."

Publicly available data tends to back that statement. Nexon claims over 160 million unique KART RIDER users worldwide, and the thousands of threads in the game's Korean forums give that number a great deal of credence. An independent English-language forum discussing the title had over 25,000 threads on the title as of this March, hinting that interest level for the game is high in the United States as well. As far back as 2005, almost a quarter of the entire population of South Korea had participated in at least a single KART RIDER race; today that market penetration is closer to 30%. Nexon.com's Alexa and Compete numbers are correspondingly high: a ranking of 1600 and a count of 600,000 for the respective sites.

The key to KART RIDER's success is its player-friendly business model. Free to play in all markets, KART RIDER uses a microtransaction model to make revenue (see "Purchasing Power", *Game Developer*, December, 2007 for more information). Players can purchase new karts for around \$5 US, with smaller customizations only costing a few coins. The



T3 Entertainment's AUDITION.





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beauty of this model from a business standpoint is that even the most basic gameplay elements can be taxed; changing which weapon you have online while on a track costs roughly two cents. The sheer number of players moving through the game means that no individual player need bear more than they are willing to pay. According to Fortugno, Nexon still manages to collect some \$16 million in profit a month.

## TECH-CONNECTED TEENS

These impressive figures are a direct result of compelling gameplay delivered without a lot of overhead, but many companies are investing heavily in even simpler online interactions. Online social environments have seen a huge amount of growth in the last two years, especially in the area of teen-aimed services. That investment is spurred on not only by media-friendly titles like *SECOND LIFE* and *There.com*, but also by quietly successful ventures like Sulake Corporation's *HABBO HOTEL*.



Sulake Corporation's  
**HABBO HOTEL.**

Though Sulake is more closed-mouthed about its financial success than Nexon, the company's numbers are equally staggering. Using simple, stylized imagery and offering nothing more advanced than the ability for users to customize their own rooms, *HABBO* has grown to become a service with more than 8.3 million unique users (as of Dec. 2007). 89 million accounts have been made inside the hotel over the last seven years, with average concurrency hitting 100,000 users. The North American version of the *HABBO* site has been well-received as well. Some 50,000 forum threads, a *Compete* count of 450,000, and an *Alexa* Rank of 2200 speak to the site's attractiveness. Though Sulake is reluctant to translate this popularity to dollar data, lead designer Sulka Haro jokes that his company "holds the world record for virtual sales of reindeer poop." This past holiday season saw Sulake move 70,000 copies of the digital scat.

Though they may not be able to match that level of social impact, *THERE* and *SECOND LIFE* do have a number of dedicated followers. *There.com*, for example, has reported over a million registered users as of last summer. Its forums are teeming with life, playing host to over 335,000 threads. As for the *There.com* domain, it holds a *Compete* Count of 100k and an *Alexa* Rank of 35,000. *SECOND LIFE*, in turn, averaged roughly 550,000 unique users a month as of this past December. Its *Alexa* Rank is 2400, and its *Compete* Count is 400,000. Interestingly, corporate investment

in these virtual worlds has led to a number of side projects and 'spin-off' worlds.

*There.com* in particular has had a great deal of success with this model. The central *THERE* experience played host to "Club Scion" last summer. The unique virtual advertisement featured a number of ways to interact with the automotive product, including dancing in a Scion-themed club, snowboarding down an art piece made out of Scion vehicles and (of course) test-driving a vehicle inside the virtual world. By the end of the event 13,000 users had visited the location. The number may seem small, but in total *There.com*'s avatars logged 1,915 hours inside the advertisement—roughly 9 minutes per user. At this year's GDC presentation on the project, the ad's developers offered the statistic that the average interaction with interactive online advertisements last 14 seconds. Comparatively, that's an eternity.

Makena Technologies, the company behind *THERE*, has also found success licensing the technology to third parties wanting to make their own virtual worlds. *There.com* underpins the cluster of worlds known as *VIRTUAL MTV*, offerings which currently include eight different environments. From *VIRTUAL LAGUNA BEACH* to *VIRTUAL PIMP MY RIDE*, the constructs are an attempt to update the corporate edifice of MTV by bringing the network's popular shows directly into the viewer's lives. They're popular as well, with half a million users registered for the service in their first six months of operation.

The appeal for users is that it allows them to own the brands and incorporate themselves into the 'world' of the shows. Users have their own cliques, social clubs, and events, as well as unique opportunities to speak with the real *Laguna Beach* and *Pimp My Ride* stars. In turn, MTV gains access to a willing microtransaction market, ready to purchase virtual outfits and accessories in exchange for the company's digital currency. The popularity of the *VMTV* site offers a view into this experimental dalliance between old media and the new. *Alexa* gives the URL a rank of 60,000, and *Compete* offers a count of 170,000.



Makena Technologies' **THERE.**





The creators of GAIA ONLINE claim 2.5 million unique users access its online world each month.

## ONLINE TOTS AND GRAPHICAL FORUMS

VMTV and HABBO are both dominated largely by teenagers, but the quickest-growing segment of the Virtual World market has to be online experiences aimed at younger kids. While some of these are tied to specific toys, and others have the backing of well-known corporations, arguably the most popular virtual experience in the entire world is little more than a graphics front-end to a traditional forum—GAIA ONLINE.

GAIA ONLINE is often cited as a success story, but many non-users are unclear on what the service offers. It's not an MMO (yet); instead it essentially offers incentivized socialization via a web site. Users can customize a simple 2D avatar, play very simple single-player mini-games, and post messages to the sprawling GAIA forums. The hook for users is that avatars have almost endless customization possibilities; purchasing those customizations is accomplished via the in-service currency—which is in turn earned by posting to the forums and playing mini-games. The resulting social ecosystem may very well be the largest forum community on the planet. As of December 2007 the site had at least 16 million active threads. GAIA claims that 2.5 million unique users access the site each month, a statistic that appears to be borne out by the stats-tracking sites. Alexa has GAIA ranked at 250, while Compete's count tends toward the 1.2 million mark.

Of course, those cute toys and animals can beat out even the most successful forum community. NEOPETS is still one of the most successful of these non-traditional virtual experience on the internet today, though it's slipped somewhat since its heyday. In 2005 the site claimed 35 million unique users and 11 million unique IPs a month, staggering numbers for a site of this kind. As of June 2007 the site could only claim 4.8 million unique users, but the company's legacy of success lives on in the popularity of the web site. Alexa still ranks NEOPETS.com at 160, while the Compete count soars off the charts to 3.7 million.

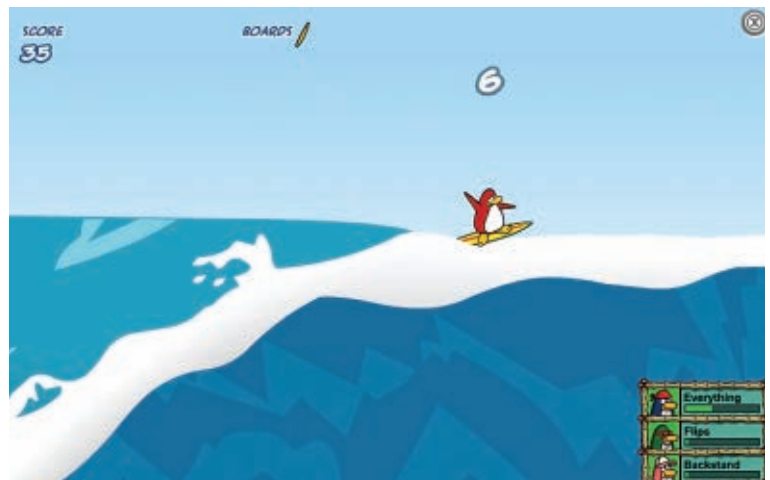
Other more recent virtual worlds are proving similarly attractive to a younger audience. WEBKINZ made headlines this

past Christmas when servers buckled under the demands of young 'kinz owners. Though negative PR still haunts the company because of that setback, it still stands tall among youth-oriented virtual worlds. Just before the server crashes the service was claiming 6 million unique users. Alexa places the site's Rank at 1600, while Compete's Count sits at 5.2 million. The 'official unofficial' forums at WebkinzInsider strain under the load of some 120,000 threads.

CLUB PENGUIN has also been making headlines, but for marketplace successes instead of setbacks. The world's simple cartoony graphics, depicting penguin avatars interacting on ice floes, is possibly one of the most basic environments you could imagine. Players don't even have the ability to effectively communicate with each other, because of concerns over the Child Online Protection Act laws. In spite of (or perhaps because of) this limitation, 2.9 million unique users accessed the service in January of this year. Alexa ranks the site at 400, while the Compete count for CLUBPENGUIN.com is just

above 3.5 million. These huge numbers have translated into a visible stamp of approval from mainstream entertainment; CLUB PENGUIN was purchased by the Walt Disney Company in the summer of last year. \$350 million exchanged hands in the initial deal, with another \$350 million promised if traffic stays consistent through 2009.

As a company Disney has tackled the virtual marketplace with gusto. Since January the company has launched its free-to-play MMO PIRATES OF THE CARIBBEAN ONLINE, and announced plans for another half-dozen more virtual worlds over the next several years. These include, among others, plans for a world themed around the Pixar film *Cars* and a new offering—PIXIE HOLLOW—riffing on the company's brand of *Disney Fairies* books, toys, and upcoming movie. To clarify its participation in the marketplace, the company recently made the decision



CLUB PENGUIN allows young players to compete in a variety of mini-games.



to close its long-running VIRTUAL MAGIC KINGDOM project. The project was originally launched in 2005 to coincide with the Disneyland 50th anniversary celebration. That closing has drawn a wave of criticism and frustration from fans—remarkable considering the world's simple gameplay and limited social interaction capabilities.

For many observers Disney is acting as the financial vanguard of big business participation in this space, but the company is not alone. Nickelodeon is hard at work on several virtual offerings. The NICKTROPOLIS social offering has been online since January of 2007, operating out of the highly successful nick.com domain. Cartoon Network will soon be offering a competing service called FUSION FALL, which will allow users to interact with the numerous CN characters. Mattel has already had runaway success with its BARBIE GIRLS world, released just last year. The company was already boasting 6 million registered users in July. Alexa puts its rank at 3000, and Compete's count has Barbie's world right around 725,000.

## TRENDING TOWARD TINY

The number of virtual worlds and massively multiplayer games in development has never been higher. Venture capitalists have begun to see the potential the genre affords, and are following developers and designers into the marketplace with reckless abandon. While new ideas and innovative thinking aren't precisely rare, the prevailing trends of genre, business model, and customer base remain. For developers willing to put aside their preconceived notions of what MMO gaming is, a number of possibilities open up.

The most obvious lesson from these game statistics is that beating WORLD OF WARCRAFT doesn't have to be your business model. Despite the popularity of a single style of online game, there are still a number of niches left to explore.

Even among online game developers, who otherwise pay close attention to these statistics, the importance of games like CLUB



Disney's PIRATES OF THE CARIBBEAN ONLINE.

PENGUIN is often overlooked. CLUB PENGUIN offers almost nothing to its users other than connectivity. Because it serves its community with the tools they need to interact while assuaging parental concerns, the users pour in.

The ascendance of WEBKINZ and BARBIE GIRLS is the beginning of a trend that isn't likely to come to a conclusion any time soon. Virtual world tie-ins with brick-and-mortar products are going to become increasingly common in the coming years. The increasing availability of repackaged virtual world software will make rolling out "Crest Online" or "Cheetos Place" all that much easier.

By the same token, online communities are becoming less resistant to alternative modes of communication. Voice chat's prevalence will extend even further throughout the lives of gamers on and off-line. Micro-sized virtual worlds that allow small groups of users to collaborate in a private space will augment or take the place of traditional forums.

Fewer and fewer online spaces will push system PC specifications to their limit. Sacrificing graphical fidelity in the interest of playability and communication will be an easy decision for developers looking to make a virtual space in less than six years.

Ultimately the line between virtual world, web site, MMO, and forum will become extremely blurry. The benefits of incentivizing user interaction and participation (as seen in GAIA ONLINE) will further cement the idea of a web site as a game.

Regardless of the specifics of who succeeds or fails, the future of online gaming is not going to be written exclusively by AAA titles aimed at a niche audience. The broad swath of humanity that will never care about raiding, player vs. player combat, or high end 'loot' is waking up to the potential of persistent online interaction. The services and experiences offered to them will ultimately depend on the developers and investors willing to see beyond the shadow of an industry leader. Those looking for a "WoW killer" from above, from the realm of 500 million-dollar projects, will never see the little guys coming. ❖



Blizzard's WORLD OF WARCRAFT: THE BURNING CRUSADE.





# Unreal Technology News

by Mark Rein, Epic Games, Inc.

Canadian-born Mark Rein is vice president and co-founder of Epic Games based in Cary, North Carolina. Epic's Unreal Engine 3 has won Game Developer Magazine's Front Line Award for Best Engine for the past three years, and Epic was awarded Best Studio at the 2006 Spike TV Video Game Awards. Epic's "Gears of War," the 2006 Game of the Year, has sold over 4.7 million units on Xbox 360 and PC. Epic recently shipped "Unreal Tournament 3" for PC and PlayStation 3, and is on track to ship the Xbox 360 version this summer. "Gears of War 2" is scheduled for release in November.

## Upcoming Epic Attended Events:

**Sony DevStation08**  
London, UK  
June 10-11, 2008

**GameHorizon Conference**  
Newcastle, UK  
June 18-19, 2008

**E3 2008**  
Los Angeles, CA  
July 15-17, 2008

**Microsoft Gamefest**  
Seattle, WA  
July 22-23, 2008

**Casual Connect**  
Seattle, WA  
July 24-25, 2008

**GC Developers Conference**  
Leipzig, Germany  
August 18-20, 2008

Please email:  
mrein@epicgames.com  
for appointments.



## WIN CASH AND PRIZES IN THE \$1,000,000 INTEL MAKE SOMETHING UNREAL CONTEST

Epic has launched the \$1 Million Intel Make Something Unreal Contest, which rewards Unreal Tournament 3 mod-makers with cash, computer hardware prizes, the opportunity to show off their work, and even a shot at winning an Unreal Engine 3 license.

The contest consists of four preliminary phases – each with its own categories, judging and prizes – and culminates with a grand final selection of the best mod overall. The contest runs through the end of next year, so there is plenty of time to create lots of content.

Epic will accept mod entries for Phase 1 until June 27, 2008. Phase 2 will close on October 17, 2008, Phase 3 on May 15, 2009, and Phase 4 on August 21, 2009. The date of the grand final judging will be announced at a later date.

Now that we have begun taking mods, it's time to explain what we are looking for in Phase 1, as well as what can be won in each category.

Prizing for all Phase 1 categories will be awarded as follows: 1st Place: \$2,500; 2nd Place: \$2,000; 3rd Place: \$1,500; 4th Place: \$1,000; and 5th Place: \$500.

The "Best Mutator" category is available only in Phase 1. Here, we are looking for changes to a UT3 game type.

"Best New Weapon" simply recognizes the top new instruments of destruction. Mod-makers who do not enter a new weapon in Phase 1 may be interested in Phase 3's "Best Weapon Set" category.

The "Best New Game Type" category is also exclusive to Phase 1, and focuses on gameplay. New game types may use new levels and original content, or use existing UT3 levels and content. In addition to \$2,500, the first place "Best New Game Type" winner will also receive a high-performance Skulltrail PC, featuring dual Intel® Core™2 Extreme quad-core processors.

The "Best Tool" category, only available in Phase 1, rewards UT3 tools and utilities. Tools can be external, like an UnrealScript development environment, an .ini manager or an application that adds functionality within UT3.

"Best New Character" and "Best New Customization Pack" rewards new UT3 character models as well as accessories, i.e., collections of helmets, facemasks, shoulder pads and other character customization options. The first place winner of this category will win cash, and also receive a high-performance Skulltrail PC

with dual Intel® Core™2 Extreme quad-core processors. This category is also open in Phases 2 and 3.

"Best Capture the Flag Level" rewards CTF game type levels that mix great gameplay with strong visuals and excellent performance. Original or existing UT3 content can be used here. In addition to winning cash, the first place CTF winner will also score a high-performance Skulltrail PC with dual Intel® Core™2 Extreme quad-core processors. We will continue to accept CTF level mods through Phases 2 and 3.

The "Best Warfare Level" category has the same requirements as "Best CTF Level," except this applies to the Warfare game type. Warfare mods can also be submitted in Phases 2 and 3.

"Best Vehicle Capture the Flag Level" rewards a balance of great gameplay, visuals and performance. Original or new UT3 content is welcome. First place will net cash, plus a high-performance Skulltrail PC with dual Intel® Core™2 Extreme quad-core processors. We will accept vCTF level mods in Phases 2 and 3 as well.

The "Best Deathmatch Level" category rewards a balance of great gameplay, visuals and performance in a deathmatch level. The first place winner will receive cash in addition to a high-performance Skulltrail PC with dual Intel® Core™2 Extreme quad-core processors. We will also accept deathmatch mods in Phases 2 and 3.

The "Best Use of Physics" category rewards the most interesting uses of physics within UT3's gameplay. The physics category will run through all four preliminary phases, so there will be plenty of opportunities to submit mods of this type.

We invite everyone in the community to participate, whether it's by making mods, rating entries or just trying them out. Mod developers, it's time to show off your creativity and Make Something Unreal!

For more information on the contest, check out [www.makesomethingunreal.com](http://www.makesomethingunreal.com)



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# INTELLIGENT BRAWLING

## Analyzing the Genre to Build a Better Beat 'Em Up

» **OFTEN THE HARDEST PART OF GAME DEVELOPMENT IS TAKING** the time to pause, reflect, and determine what is and isn't working. One of the best tools for this analysis is looking at what other similar games are doing. Too many games are developed with blinders on, and the developers only look briefly and casually at previous titles in the genre. There are countless lessons sitting out there, waiting to be learned.

I'm a creative manager at THQ, so it's my job to help external developers make their games more fun. CMs work with project managers who make sure things get done on time and manage everything else—we creative managers are pure quality control. I recently worked on the next-gen third-person swords-and-sorcery CONAN game with the talented folks at Nihilistic.

Let me take you back to about a year before launch. Development has been going well: The controls are fun and easy to pick up, there are plans for lots of unique content, there's a first playable that people enjoy, and everyone's excited about the promise of this title. But around the time of the first playable (aka vertical slice, aka razor edge), I'm becoming more and more aware that our AI is not really there yet. This is no big surprise, since it's early, AI is hard, and these things take time, but I wanted to give Nihilistic some clear, detailed feedback on what they could be doing to make it better.

I wanted to be very certain that the changes I suggested would be actual practical needs, not just theoretically good things. For example, I'd been asking for good gating—different

ways to keep the player from running past enemies without fighting them. But the more I thought about it, the more I realized that many games do fine without good gating. I flew through the last half of HALO 2 without firing more than a few shots. I wanted to find out which things really matter. And luckily, I had a little bit of free time, so I went to the source to do a little research.

### METHODOLOGY

I picked out some of the top games in our genre, and loaded them up. Title selection was somewhat erratic, based on what I had lying around, but I made sure to include a few well-reviewed commercial failures like MARK OF KRI. Those games often have the best ideas to steal. Most—but not all—were games I'd played previously. A few games that I tried were too far out of my genre to apply. For example, the fights in SPARTAN: TOTAL WARRIOR were just too big, with dozens on each side. HEAVENLY SWORD came out after the analysis for CONAN, but was added after the fact.

In each case, I would get to the first significant combat encounter that had at least three enemies active at once. I would play this encounter repeatedly, spending most of my time doing nothing but holding down block so I could just watch the enemies and how they acted. For a few of the specific questions, I needed to move around or attack or otherwise break from block. And with some games, I would go a few more encounters in, especially if I knew major new combat concepts were added fairly soon.

CONTINUED ON PG 16

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**TOM SMITH** is a creative manager at THQ, and was previously a design director at High Voltage Software. He likes pie. You can reach him at [tsmith@gdmag.com](mailto:tsmith@gdmag.com).

CONTINUED FROM PG 15

Yes, this is not how most players play. But I wanted to distill the AI down to its simplest, most repeatable state. To balance the block-focused bias, I made sure to also spend some time using normal blocking and attack strategies to see if the AI changed radically. In a game without block, I'd suggest finding another repeatable strategy that lets the AI (or whatever is the subject of



A screenshot is shown from an old build of CONAN, showing the inner and outer rings where the AI position themselves. In later builds, enemy position on each ring was more varied.

testing) do its thing without the interference of constantly being damaged or killed.

I came into the tests with a list of questions based on my previous experience and my concerns on my current title. As I played, I developed a few new questions and had to go back to previously played games to see how they handled those situations. All process is iterative.

## ATTACK GROUPS

*Questions:* How many enemies fight the player at once? How do they organize themselves around the player?

**GOD OF WAR (PS2):** Enemies fall into clearly two separate groupings—a close group within a weapon's reach of the player character, and a far group a few meters away. All attacks come from the close group. With zombies and harpies, the close group is limited to three enemies at a time. I sometimes can get four near, but it corrects itself quickly in that case. The far group contains 12–15 enemies.

Enemies cycle from close to far fairly regularly, possibly on a timer, possibly just as a side effect of natural movement—hard to tell. Enemies in the far group pretty much just stand there, only switching to the close group if a gap appears.

**MARK OF KRI (PS2):** Two groups, a near group and a far group similar to **GOD OF WAR**, but the near group is only one enemy at a time. The far group contains about three enemies in these early encounters.

The near enemy stays near for a while (up to a minute) and makes multiple attacks with time gaps between. Then he goes back to the far group and someone else takes his place. This change of guard normally feels organic, because players tend to move and thus approach enemies in the far rank, giving that enemy an opportunity to switch. But even without movement, the change still happens, just in a less organic manner.

Occasionally, one enemy from the far group makes a charging attack even while someone else is in the near group—this is just a single attack, after which he returns to the far group. This charge can also be used as a way to enter the near group when the near group is empty, settling into the normal pattern after the charge ends.

**GENJI (PS2):** There's just one far mass of enemies, relatively far from the player. Not too many enemies in this group (3–5), at least at the start of the game. One enemy chooses to approach from that group, and then he walks slowly towards the player character. Once he is near the player, he makes one attack (multiple attacks for special enemies), then walks back to the far group.

**PRINCE OF PERSIA: THE TWO THRONES (Xbox):** There is just one group of enemies fairly near the player. One enemy chooses to attack, makes a single attack or a combo, and then goes back to the group. Enemies usually come in fairly small groups; about three enemies at a time.

**NINJA GAIDEN (Xbox):** There is one group of enemies, usually three or fewer at a time. One enemy chooses to attack, makes a single attack or a combo, and then goes back to the group.

**HEAVENLY SWORD (PS3):** There are more enemies than most games—up to 20 at a time—but still grouped in a near set and a far set like many of the other games. The near group is at most four enemies, and enemies in the far groups can still attack. The positioning, especially in the far group, is widely varied, with enemies appearing more like a jumbled mass than a clean circle. This variety feels good and makes the grouping less obvious without confusing the player, since the near group is usually clearly defined.

*Conclusions:* The solutions used here are more varied than I expected. All the games group their enemies into one or two groups around the player character, but how the enemies attack from their groups varies a lot from game to game.

**PRINCE OF PERSIA** and **NINJA GAIDEN** both keep enemies in a single group, with one enemy breaking from the group to make a single attack. This works well with smaller groups, but for our game, we want over a dozen enemies at once, so we need to spread them out more if we're going to fit everyone.

**MARK OF KRI** and **GENJI** felt a bit artificial, because one enemy from the group would call the player character out for multiple attacks while the others watched. **Genji** could at least argue that the pattern fit the dueling style of the game. I did like the surprise attacks that **MARK OF KRI** added from the far group—it made those distant enemies much more meaningful. The player has to keep half an eye on the outer ring at all times.

But overall, **GOD OF WAR** and **HEAVENLY SWORD** had the best feel. Having multiple enemies near you keeps things on edge and makes it harder for the player to tell what to expect next—which was reassuring, since that was the basic direction we were already considering.

## TIMING

*Questions:* How often does the player get attacked? Is attack timing decided individually by each enemy, or controlled centrally for the whole group? Do multiple enemies attack at the same time?

Every designer should keep a stopwatch handy for times like this. You never know when you will need precise measurement to turn vague impressions into meaningful data.



**GOD OF WAR:** When just blocking, the player gets attacked about every two seconds. Enemies appear to be attacking independently—they aren't really coordinating their timing apart from some basic spacing of attacks. If there are fewer than three in the close group, the attacks are less frequent. The two-second pattern is just a result of each enemy attacking about every six seconds, and there usually being three enemies attacking at a time.

**MARK OF KRI:** Timing varies widely. The primary attacker usually attacks every 3–6 seconds, but sometimes there is a gap of up to 20 seconds. It feels like there is some pattern—a long pause followed by a short series of attacks—but it's not consistent enough to say that for sure (my brain may just be looking for patterns that don't exist). The attacks from the far group are less frequent—every 5–30 seconds—and it seems like distant enemies are more likely to attack immediately after the near enemy does. Some of the wide variation in far attack timing comes from the time it takes the far enemy to find a valid attack position—the enemy in the inner ring often gets in the way, especially in more narrow areas. So a far enemy may decide to attack in conjunction with the near enemy, but if it takes him an extra 20 seconds to find an attack slot, his timing ends up out of sync.

**GENJI:** There's an average of six seconds between attacks, which is much longer than the other games. Because only one enemy is

near and attacking at a time, there's no need for a group timer.

**PRINCE OF PERSIA:** The player is attacked about every four seconds. Attack timing is controlled completely from the group level. There is very consistently someone attacking every four seconds, but individuals may go a long time between attacks depending on who is chosen at the group level. AI attacks often fail to collide with the character even with no player input beyond blocking to avoid them (not moving, not dodging, not attacking), which feels odd. Not sure why this is happening—it seems like a bug. My best guess is it's a sync issue with the block animation—block makes the player character crouch down a bit, and the attacks appear to go over his head.

**NINJA GAIDEN:** This game seems to vary more than most—2–5 seconds between attacks. Attack timing seems to be controlled at the group level, similar to PRINCE OF PERSIA.

**HEAVENLY SWORD:** There's usually a four-second gap between attacks, but about two of those seconds are the attack itself, as even early enemies regularly use combos. In some cases, it could go much longer between attacks, especially in the first couple of battles, where AI helpers can distract AI enemies. Attack timing seems to be controlled at the group level: Overall timing is consistent, but timing for individual AI varied wildly.

*Conclusions:* There were generally about 2–5 seconds between attacks, but more variation than I expected, especially in real-world conditions when the character is moving around

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and causing chaos. This seems to be a real 'flavor' element—games that take longer between enemy attacks feel more strategic, and games that take less time feel more intense. And predictability of this timing seems to be a meaningful difficulty factor—enemies that attack at fairly regular intervals are easier to predict, and thus encourage blocking and help the player learn patterns. The games that are less predictable are the ones that are generally considered more hardcore games.

## COMBOS

*Question:* Do enemies attack with one action or multiple?

**GOD OF WAR:** Zombies use a two-hit combo. Harpies have one big charge attack instead of a combo, due to their unusual flying movement style that doesn't lend itself as well to stationary combos.

**MARK OF KRI:** Combos vary by enemy type, with the very first enemies doing only single attacks, but quickly introducing bigger enemies who have a consistent three-hit combo.

**GENJI:** Most enemies do a single attack, but many encounters have one enemy who is a bit more powerful—I'll call him a captain. When the captain attacks, he makes three unrelated attacks before heading back to the group. It's not a traditional combo in that the animations don't really link up, but in the context of this grouping method, it acts like a combo.

**PRINCE OF PERSIA:** The early enemies have a few three-hit combos, but also use a one-hit attack sometimes. The attacks seem to be determined by random chance.

**NINJA GAIDEN:** Enemies use combos even very early on. Player blocking is very important to the gameplay, so this make sense. Combo patterns encourage blocking, especially when the player can block in response to the first hit in order to avoid later hits.

**HEAVENLY SWORD:** Single attacks dominate the first couple of fights, probably because the AI helpers in these fights change things up a lot. Three-hit combos are consistent by the third fight.

*Conclusions:* These games use more combos in the early stages than I expected, and with more irregularity than I expected. The early appearance of combos appears to be a stylistic difference—if a game uses combos for most of the enemies over the course of the game, then it is worth

introducing that concept early on to get the player comfortable with them.

Irregularity felt awkward to me. Personally, I believe that combos should be an either/or thing, consistent for each type of enemy. If you have enemies with a percent chance of doing a combo, it becomes hard for the player to recognize any pattern and react to it—unless the goal is to make it really hard to predict and react, which plunges the game into hardcore territory very quickly. I think the games that randomized this were weaker for it—but that's me interpreting the results, not an empirical finding.



GOD OF WAR.

## LOOKING STUPID

*Questions:* What do enemies do when they're not attacking? What do enemies do to avoid looking like they are uninvolved in the combat?

**GOD OF WAR:** Enemies in the far group just stand around and look relatively uninvolved. But they're zombies, so it looks OK. [Personally, I believe the popularity of zombie-killing games is partially fuelled by the lower AI expectations—they're supposed to be mindless, so game development is easier.

That, and zombies are the only thing as fun to kill as Nazis.] Enemies in the far group would occasionally play a yell/cheer animation that seemed more involved, but it was fairly infrequent. I get the feeling that they noticed this problem near the end of development and made this animation to fix it, but it turned out to be just a bandage.

**MARK OF KRI:** Enemies in the far group are constantly moving, mostly just sidestepping in a ring around the player. This makes them feel active without really affecting gameplay, especially since the motion is centered on the player character. The close enemy stands still a lot, but his animation and facing make him seem to be watching the player character and waiting for an opportunity, so it feels appropriate.

**GENJI:** Enemies are always moving in a slow, pacing, stalking motion. It does a good job of making them appear involved in a samurai-appropriate way. But they tend to get stuck on environmental objects and appear to moonwalk, which ruins the illusion. If their pathfinding had been able to better account for obstructions, it would look a lot better.

**PRINCE OF PERSIA:** Enemies are always moving, which makes them feel involved, but the animation looks twitchy when changing between AI states, which ruins some of the effect. If it were smoother, it would feel even better.

**NINJA GAIDEN:** Enemies mix side-step movement with standing in a fencing pose. The fencing pose does a good job of appearing involved even when they're not moving. My expectations may change a bit for ninjas, as I expect them to be controlled and cautious in their motion. A stiff animation makes sense for a ninja.

**HEAVENLY SWORD:** Enemies use a circle strafe walking motion to appear to be doing something. But there are times when this behavior falls apart, and enemies strafe in a circle, or stand in place, or run to get to a seemingly random position. There are no occasional cheering animations.

*Conclusions:* Having enemies pace and sidestep when awaiting combat feels good. It makes the character feel active and also masks small positional changes without having to pop out of a standing animation. Occasional animations like the yell in GOD OF WAR don't really help much, since there are still long periods of just the base animations.



GENJI: DAY OF THE SAMURAI.

CONTINUED ON PG 20



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CONTINUED FROM PG 18

Getting the right feel for the base animation helps a lot—characters who appear to be focusing on the combat instead of just using a generic standing animation feel much better. And tweaking one animation is a much simpler solution to execute than trying to fix this with complex AI changes.

It was interesting to note how many little bugs ruined otherwise good animation. That may partially be an artifact of my methods breaking the system or my overly analytical approach to the situation, but I think a bit more playtesting and review of content once it's actually in the game code would have helped many of these games.

## TELLS

*Questions:* How does the player know an attack is coming? Is the attack animation built with a clear indicator at the start, before the attack is active?

**GOD OF WAR:** There's a small setup time in the animation, but nothing huge to telegraph the moves. It's enough time for a quick reflex reaction, but not enough for thought. Tells get more significant with later enemies where player avoidance is more necessary, but within the context of this test, there were no tells.

**MARK OF KRI:** Most attacks have a significant animation portion before they're active, which acts as a tell. They appear to be built specifically to fulfill this role.

**GENJI:** Since each enemy approaches from the far group before attacking, the approach phase movement acts as a tell, allowing the player to prepare his reaction. Each attack also has a small animation tell.

**PRINCE OF PERSIA:** Travel time from the far group to an attack position works as a tell. Unlike in GENJI, these enemies don't really walk up, pause, then attack—the approach is part of the attack—but it still leaves enough time for a quick block.

**NINJA GAIDEN:** The time required to run up to the player character acts as a tell, since enemies start a fair distance away.

**HEAVENLY SWORD:** A big colored flash and glowing streak occurs before every enemy attack. Later in the game, the color lets the player know what type of attack is incoming, which affects how the player should block. It certainly solves the problem, but it breaks the otherwise detailed, realistic look of the game. Having multiple defense types based on incoming enemy attacks sounds like a good idea, but if a big colored streak is the only way that players will really understand it, I'm not sure the benefits are worth the cost.

*Conclusions:* Most of these games don't use explicit tells, at least for smaller human-sized enemies. Many of the enemy attacks use forward motion as a tell, which works best if enemies are attacking from a far group. The lack of tells doesn't surprise me, as my expectation for this genre is that tells are more important with boss or sub-boss enemies with huge,

exaggerated motions. With CONAN, we want to have more of a back and forth feel to our combat, so tells are critical to give the player a chance to block. Our tells are more pronounced than those of most of the other games I considered.

## ENEMY DEFENSES

*Questions:* What does the enemy do to stop player attacks? Do enemies block? Dodge? What types of attacks or combos are blocked?

**GOD OF WAR:** There are no defenses at this point. Later enemies do use some defenses, but even later in the game defenses are more the exception than the rule.

**MARK OF KRI:** The first enemies are defenseless, but blocking enemies show up within the first few encounters. They don't block terribly consistently, though. It seems to be a random chance per attack, so the player can just mash through them and land attacks pretty often. And once the player hits, subsequent hits connect before the enemy gets out of his hit reaction, so the player can really lay it on. A bit later in the game, combo counter enemies are added; enemies attack when the player initiates the light hit combo, so the player takes some damage if he mindlessly mashes buttons.

**GENJI:** There are no defenses on the first groups of enemies.

**PRINCE OF PERSIA:** There are no clearly defensive actions. The interrupt attack (described as part of the next question) is similar to a defense, but it is more of a reaction than a block, so I didn't consider it here.

**NINJA GAIDEN:** Enemies block. A lot. It doesn't really surprise me, as this game is generally considered to be very hard, partially due to difficult enemy defenses.

**HEAVENLY SWORD:** By the third fight, there are a few enemies with shields. The shields completely block all basic attacks, but are vulnerable to anything else. There is a fairly wide variety of alternatives in the player's combat system (finishing moves, heavy attacks, grabs, etc.), so it's a good guidance to encourage the player to not just jam the same button all the time.

*Conclusions:* Little to no defenses at the start seemed to be the norm, but most of these games introduce some form of defensive action fairly early in the mission progression. This makes sense—enemy defenses are a great way to guide the player to use certain attacks, but the first few encounters should be as easy as possible to aid the player's learning curve. I was happy to see that in some games, enemy defenses are used early on specifically to discourage button mashing strategies—this is something we'd been considering for CONAN, so this gave me validation to push harder on that point.

## INTERRUPTS

*Questions:* Do the enemies interrupt player attacks with their own attacks? Are certain moves immune to interruption?

**GOD OF WAR:** Enemies sometimes interrupt player attacks, but it doesn't happen very often. Enemies often trigger attacks during player attacks, but rarely actually hit with these attacks. The reason for this is that the forward motion on most player attacks is enough to get the player out of range of most zombie attacks. So interrupts are discouraged as a side effect of other decisions, but not actively prevented. Later on in the game, enemy interrupts become more effective. But even then,



NINJA GAIDEN.





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certain special moves like the grab make the player character invulnerable, so even later on special moves cannot be interrupted. But this is seen as an exploit by some players, so it might not be something to replicate.

**MARK OF KRI:** Enemies can interrupt player attacks, but it doesn't happen terribly often. Only having one enemy on the player character at a time reduces the chance of interruption, especially since that one enemy is often going through hit reactions instead of attacking. Distant enemies can interrupt, but those attacks have a long tell. Interrupts don't stop the player during certain special moves like the finishing move.

**GENJI:** Enemies are very willing to stick to their normal attack patterns and timing when the player attacks, which means interrupts happen fairly often.

**PRINCE OF PERSIA:** When the player attacks, it appears to consistently trigger someone other than the target to initiate an attack on the player character. It appears to be deliberately triggered beyond just the normal attack timing, but it's hard to say for sure. The timing of this attack relative to the player attack (and space between the two) means that this enemy usually won't hit the character until just after the player's three-hit combo ends. Player motion sometimes takes the player away from the counterattack, but not usually. This dynamic tends to encourage the player to use an attack-attack-attack-block pattern to prevent this counterattack from hitting. I find it odd that a game that supposedly is more acrobatics-focused would encourage such a specific pattern this early in the game. Strong patterning like this seems more hardcore than I would expect from this series.

**NINJA GAIDEN:** There are lots of interrupts, and the player's block triggers relatively slowly, so the player has to really predict in order to block them.

**HEAVENLY SWORD:** There are lots of interrupts. Even with some forward motion, it's still fairly easy to get hit by a third party if the player is not watching out for everyone.

*Conclusions:* Enemies were much more willing to interrupt than I expected. Most of these games allow random "no fault of the player" interrupts even very early into the game. But in most cases the mechanics and timing are set up so that interrupts don't happen too often. I expected to see more games explicitly prevent these interrupts. This gave me reason to change my feedback to not worry about this so much. I

still discourage it, as I still believe it's potentially frustrating to casual players, but I didn't spend as much time or effort ensuring it was completely eliminated in all cases.

## PLAYER MOTION

*Questions:* What do enemies do when the player runs around instead of standing still? What do enemies do if the player tries to leave the fight?

**GOD OF WAR:** Man, they're quick. Zombies can get back to their preferred position with very little delay when Kratos moves away. And that's what they do, even if it requires somewhat artificial motion to get to the spot they want. Again, the expectations for zombies make the erratic motion not look so bad. They don't attack until they get into position again, but it's quick enough to keep things moving.

**MARK OF KRI:** The one enemy in close consistently attacks and hits if the player character tries to run away. If the player character gets a little bit further away, that enemy will move in very quickly to keep up. Running around is punished enough that it is not something players can really get away with once a fight starts.

**GENJI:** Enemies stick to their normal attack pattern even when the player character is running around. One enemy is "blessed," and he'll pursue to attack while the other enemies attempt to maintain their distant position. The player can walk right up to enemies in the distant group, and they won't even consider attacking unless they get "blessed." This can create some very awkward AI situations, especially with a player looking to exploit the system rather than to play naturally.

**PRINCE OF PERSIA:** When the player is running away, enemies still use the group attack timer, but the player can't get away without passing right next to an enemy from the far group. The enemies in the far group can attack very quickly—the danger of the quick attack animation is normally mitigated by the time it takes for the enemy to approach. If the player runs up to an enemy, the tell is effectively removed, and the enemy can attack before the player has time to react. This is an interesting, natural way to discourage the player from bolting from a combat.

**NINJA GAIDEN:** Even when the player character moves, enemies use the normal attack sequence. The enemy who is currently attacking runs extremely fast to keep up with the player, making it hard to get away for more than a moment.

**HEAVENLY SWORD:** The mass of enemies slowly follows the player character, but there are occasional attacks which have strong forward motion that often allows them to catch up. Most of the levels in the game are made up of relatively small arenas, so the enemies never have very far to travel to catch up.

*Conclusions:* Most enemies maintain their previous behaviors, moving to follow once a certain distance is reached. A few games use harsh denial methods and/or sudden speed bursts to ensure that the player doesn't go anywhere once combat starts. In my opinion, these methods are overcompensating—if the player wants to reposition or change opponents without leaving the fight, these systems can interrupt player intent in an awkward way. The goal of discouraging players from completely breaking off during fights is a reasonable goal, but these methods create more problems than they solve.

## GATING

*Question:* Can the player avoid enemies by running past them?

**GOD OF WAR:** Almost all the early encounters don't offer a path



THE MARK OF KRI.





PRINCE OF PERSIA: THE TWO THRONES.

out until the player kills lots of zombies. If the player tries to open a door or activate an object before killing everyone, the player character will usually get hit before he can finish, which is something we'd been discussing for CONAN. Later in the game, some battles add magical walls to make this even more obvious.

**MARK OF KRI:** Movement during combat is tightly controlled, given the way the enemies attack if the player character tries to run. If the player can't get away, there's no need for additional gating. If he does manage to get away, activating an object interaction (such as climbing a ladder or ledge) doesn't appear to trigger enemy attacks.

**GENJI:** Lots of invisible walls prevent moving away from combat. Each combat basically creates its own artificial space, and the player character is stuck there until the combat is finished.

**PRINCE OF PERSIA:** There's no gating on these first encounters—it's pretty easy to run past and jump away, especially given all the movement abilities the Prince has. The previous game, **PRINCE OF PERSIA: SANDS OF TIME**, would teleport enemies to positions around the player character if he ran past, but I wasn't seeing it in these early encounters.

**NINJA GAIDEN:** I didn't see any gating—I could run to the next platforming bit and get away without much trouble. Big fights or boss fights, like the horse enemy, did lock me in, but only for these big moments.

**HEAVENLY SWORD:** There's no gating, but most early battles are in smaller enclosed arenas, so there's nowhere to go. Later in the game, arenas get a touch bigger and players can create unexpected clumps or other problems by running to a hallway when a fight is supposed to be in a big area.

*Conclusions:* Apart from **GOD OF WAR**, there was very little gating in the first few encounters. Most of these games add more gating later, but they were more willing than I'd expected to allow gating to lapse fairly regularly. This was definitely useful in guiding my feedback, as I was able to shift attention away from gating and onto more fundamental questions. I do think **GOD OF WAR** is right to gate for many early encounters, to build player expectation that gating will be there, but it's not as much of a must-have for every little encounter as I'd first thought.

### ENEMY ZONES

*Questions:* What do enemies do if the player runs far away from the enemy's starting point? Do they go back to their start, or follow indefinitely?

**GOD OF WAR:** Within these first encounters, this was not really an issue, since hard gating kept the player close at all times.

**MARK OF KRI:** Enemies won't leave their home area. They'll just stop pursuing and head back to where they started. This can be exploited by players, if they can avoid the within-combat punishments for movement.

**GENJI:** The question doesn't really come up, since strong invisible wall gating prevents the player character from moving too far away.

**PRINCE OF PERSIA:** With the amount of platforming gameplay in this game, it's rare that enemies have a big area to run around in before the player can escape. So usually the player takes to the rooftops or otherwise becomes inaccessible to the enemies before the AI has to turn around.

**NINJA GAIDEN:** There are enough platforming bits between combat that this usually doesn't come

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up. Enemies can't chase because they can't do super-climb-jump motions like the player character can.

**HEAVENLY SWORD:** Early fights are in small enclosed arenas, so this isn't really a problem. Even later fights are relatively enclosed, so distance isn't really an issue.

*Conclusions:* With most games, this issue didn't even come up, since gating or alternate routes (such as platforming areas) prevent enemies from even considering chasing the player character for too long. **MARK OF KRI** is the only game which really had an issue with this, and it just sent the enemies back when it happened. In this case, comparative product didn't really answer the questions I had, due to the differences between **CONAN** and other games.

## HITS TO KILL

*Question:* How many hits does it take to kill a single enemy?

**GOD OF WAR:** One good combo (3–6 hits) kills most enemies.

**MARK OF KRI:** The first enemies take about three normal hits to kill, with a few ways to do it in fewer.

**GENJI:** One combo (3–4 hits) kills basic enemies, with two combos (eight hits) for basic captains.

**PRINCE OF PERSIA:** It takes three quick three-hit combos—nine hits total.

**NINJA GAIDEN:** Lots. Did I mention that this game is hard?

**HEAVENLY SWORD:** It takes four three-hit combos in the first two fights, and two three-hit combos in the third to kill an enemy, but



HEAVENLY SWORD.

it's very easy to use a finishing move to skip through most of that. This is actually fairly similar to our approach in **CONAN**—make basic moves a bit weaker than other games to encourage players to try out the special moves.

*Conclusions:* One combo or so to kill the basic enemies seems to feel right, especially since normal players aren't necessarily going to connect with every hit of their combos. This is another one that seems to vary wildly based on the specific goals and flavor of combat in each game. But even the games with tougher enemies would drop them after three combos, so that suggests a reasonable estimate of the upper limit.

## THE TAKEAWAY

As expected, there are some clear similarities and some wild differences in how these games handle combat AI.

Some of the variation I attribute to positive differences that make each game feel different. Hits to kill, timing, and enemy defenses vary for good reasons to enhance the specific goals of that game's combat system. When designing a combat system, the AI should fit within the world and themes of the overall game. Is combat quick and deadly, or is each fight an epic sequence? Should the player block, or charge boldly into every fight? Enemy AI is a good way to define this style.

Some of the variation is difficulty-based. Beyond just stacking the stats against the player, some games use unpredictable AI patterns or give the AI denial strategies that make life hard for the player. **NINJA GAIDEN** was the exception in a number of categories, and it's generally seen the hardest game in the genre. **PRINCE OF PERSIA** was simpler in many ways, which makes sense since it has whole layers of platforming and acrobatic gameplay to provide depth outside of the combat system.

There are some cases where the variation does seem to affect quality. Some of the games did not have very satisfying solutions for looking stupid, and finding the right balance for tells was awkward for some. This is where learning from the past can be the most useful. The places where previous games in the genre show some flaws are usually the best places to make a new game shine. But it takes time and research to find those opportunities.

Any case where **GOD OF WAR** is the exception is intriguing to me. **GOD OF WAR** managed to succeed both commercially and critically, so it stands to reason that it did some things differently and better than others in the genre. Solid gating for key encounters, clear grouping rules, and zombies seem like they're the way the genre should go in the future. The lack of tells in the zombie enemies could be likely a sampling error—I know later enemies like cyclopes have clear tells, so I think my general conclusion still works in light of that exception.

One final disclaimer: Just because this is how previous games have done it, that doesn't mean future games need to do it this way. There are other ways to organize and pace groups of enemies for combat encounters. I'm sure someone will come up with a great way to set up combat without grouping enemies into clear near and far groups. Breaking from the norm can be a great feature for a game, creating surprise and excitement. But novel solutions are still going to need to solve the basic problems addressed by the features discussed above. Any new solution still needs to create a fun pace to combat and avoid any glaring AI flaws that break the player's immersion in the game world.

Overall, I felt this was a useful exercise and gave me additional insight that I passed along to the developer. It helped me avoid making some requests that would have sidetracked development effort into unnecessary pathways, allowing us to spend more time on the things that really matter. Since I did this, THQ product development has been working on some even better forms of internal research, vastly improving my feeble attempts with video integration of reference gameplay and a variety of other improvements. I would recommend this sort of comparative analysis for anyone who has a specific issue that they know is going to be the focus of much detailed discussion. It can take time away from actually designing the game, but in the end it is worth it if it helps you make the right decisions early. Distractions are good if they help you design smarter. ❖



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# Democratizing Game Distribution: The Next Step

*The author, **Dax Hawkins**, is a development manager in the XNA Community Games group. Dax is passionate about enabling people everywhere to express themselves through the magic of game creation.*

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Studio and C# into their computer science curricula. Even more gratifying for us was seeing the games created by our community members. We were delighted by the 200-plus entries in our Dream-Build-Play contest. In fact, the games were so good that five publishing contracts were awarded — four of them by Microsoft.

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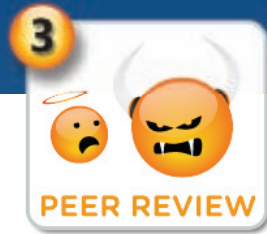




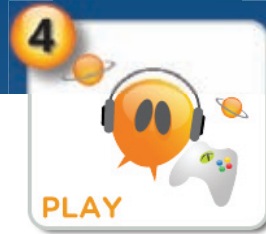
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PEER REVIEW



PLAY

development is to let creators share their games widely with others. At GDC, we announced our plans to enable a beta of community game distribution for Xbox LIVE in May. We also offered a sneak-peek of a select few games built by our community: *JellyCar*, *The Dishwasher — Dead Samurai*, *Little Gamers*, *Proximity HD*, *Rocketball*, *TriLinea*, and *Culture*. Over this six day preview period, we had over 750,000 downloads of these games!

Now, as a premium (paid) XNA Creators Club member, with the beta you'll be able to share your games with other creators via Xbox LIVE Marketplace. (For information about becoming a premium member, see <http://creators.xna.com/en-us/membership>.) When we release version 1 in Holiday 2008, you'll be able to share your games with 10 million Xbox LIVE users.

This article describes how to prepare your game for submission. It discusses guidelines for acceptable content, describes the peer-review system, and shows you how to download and play a community game. For the most up to date information and further details, check out our "quick start guide," which you can find on the home page of <http://creators.xna.com>.

This article assumes you already know how to use XNA Game Studio, you have an XNA Creators Club premium membership, and are familiar with the Xbox 360 console.

## The Rules of the Beta

Let's get the fine print out of the way. The beta for community game sharing is just that, a beta. Bear with us as we work out the kinks. The beta is a great way for you to get your games ready for prime time. It provides an opportunity for you to tell us what works, what doesn't, and what needs

improvement. Because this is a beta, there will be a few limitations, each called out explicitly with a **beta** note in this article. Here are some basic facts:

- The beta is limited to XNA Creators Club premium members. Only premium members can submit, peer review, download, and play games.
- Only distributing games in the United States region will be supported.
- Games submitted in the beta will be taken down at the end of the beta. You will need to resubmit and get your game reviewed again when we launch community games to the public.
- Have fun — as a creator, you'll have a chance to influence the submission and review systems. Give us your feedback. We will listen.
- For detailed information about the beta, see our FAQ, which you can find under Resources. Here's the link: <http://creators.xna.com/en-US/faq>.

Enough fine print ... let's get started!



CREATE

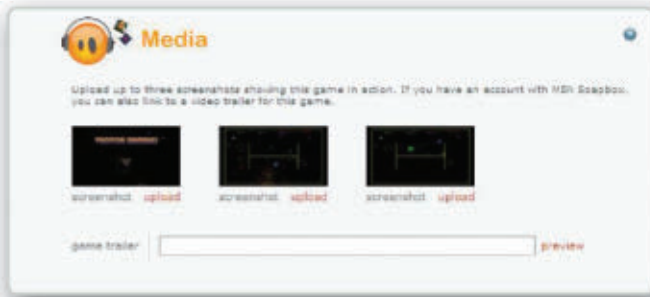
## Creating your game

The first step is to create your game. Make sure you create an Xbox 360

project, because you are submitting your game to run on Xbox 360, not Windows. The submission system accepts only files in the .ccgame format created by the XnaPack utility included with XNA Game Studio. The size of the game package file must not exceed 150 MB. You must also provide a thumbnail for your game. This thumbnail shows up as the icon next to your game both in the games catalog on the XNA Creators Club website



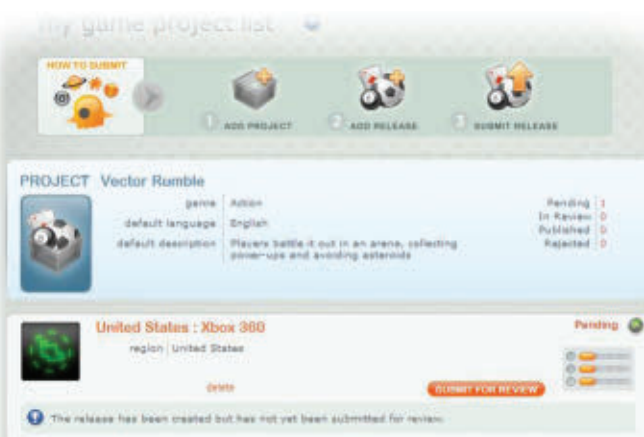
## The Next Step



The final step is to upload your .ccgame package. In the Game Upload page, click the **Save Draft** button. Depending upon your network connection and the size of your upload, your upload time could be over an hour. Note that your session will timeout after 90 minutes, so game submissions that last longer than that will not successfully upload. Now would be a great time to crack open a cold one and revel in the fact that you are about to share your game with the world!

### The Pending State

After you upload your game and its game-related information, the game is in a pending state. This means that all the uploaded information, including the binary, may be changed. Essentially, you are working on a draft of your game and release. When you are ready to submit your game to peer review, go to the project details page by editing the project and clicking the **Submit For Review** button. In the example below, the release under "Vector Rumble" is in a pending state.



Submitting a game for review is akin to shipping your game. This is an important step in the process because it enables other creators to conduct a peer review. If your game passes peer review, it will be distributed to the world. Note that peer review takes at least 48 hours — or longer if folks are slow to review your game. Because of this, we recommend you submit only games that you think are ready for prime time. In other words, get your user-testing and bug fixing done *before* you submit for review. Don't use the peer review system as a quality assurance net to catch bugs. This frustrates the community, and it means you have to wait longer to get your game placed on Marketplace. We will reject games that are incomplete, don't run properly, or have crippling bugs.

Marketplace stores only the latest version of your game. To update your game with a newer version, simply add a release to the same project. This newer game still needs to go through peer review. Once it passes the review process, it replaces the game currently on Marketplace.

### Rejected Before Peer Review

Nobody likes rejection...especially by a machine. However, before a game is accessible for peer review, it must pass validation in our system. If your game does not pass validation, don't worry — failed submissions can usually be remedied quickly. To minimize the chance of failure, be sure your game follows these rules:

- The game was built with XNA Game Studio 2.0.
- The game has been compiled for the Xbox 360 platform.
- The thumbnail included in the package is a 64×64 .png whose size is not greater than 16 KB.
- The package is virus free.



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## Peer Review

Assuming the game passes validation, it moves to the review state. The game is in the Game Catalog and accessible for download by other premium creators. You cannot change your game or any game-related information while your game is in review. If you have a change of heart, you can remove the game from the process by clicking **Cancel** on the game project details for that release.

Multiple reviews are required for a game to pass peer review. Once a game has a high enough "agree" score, it passes review. Conversely, if a game has a high enough "disagree" score, it is rejected. All reviewers are not created equal. Those who review games accurately increase their review reputation. A review by a creator with a higher review reputation holds more weight than one by a less-experienced reviewer. From the system's perspective, it is an agree-or-disagree review score that causes a game to pass, not a predefined number of reviews. However, a minimum number of reviewers is required to peer-review a game.

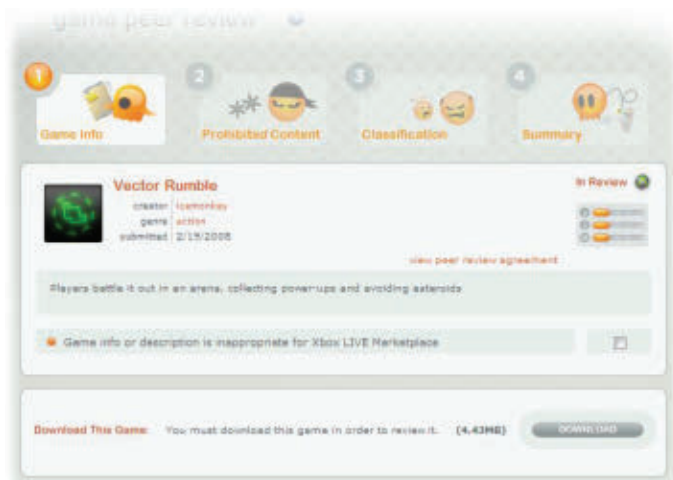
### A Note on Our Philosophy

One of the most exciting aspects of community game distribution is that we do not manage the game portfolio. Consumers decide which games to play, not Microsoft or the creator community. The primary purpose of peer review is to ensure a safe experience for consumers who browse Marketplace and then download and play a community game. Peer review determines whether the game has prohibited content. If the content is acceptable, peer review confirms the game creator's classification. Reviewers make no judgments whether the game is fun. A game's entertainment quality is

decided by game players on the console through an explicit user-rating system and downloads.

### Download

Download the game to begin your peer review. While authors may not review their own games, they can review the games of others. If you are signed in as a premium creator, you can filter on a list of games to review in the Game Catalog. Click **Review this game** to begin the review. Your first job as a reviewer is to make sure the game information that shows up in Marketplace is accurate and appropriate for all ages. This includes the thumbnail for the game, the title and genre, and its description.



Use this page to download the game to your PC. You cannot proceed with the review until you have downloaded the game. Once you download the game, unpack it and deploy it from your PC to your Xbox 360 console.

Guess what? You just got a free game! You are one of the few to see this game before it makes it big. Take notes. Does it have bugs that make it unplayable? Does the content match the game author's classification? Is it asking you for your credit card information? Once you've played the game, come back to the Creators Club website to review it.

## The Next Step



### Game Info

Verify that the game information in the screen shots and video accurately reflect the game you just played. Does the game play all the way through without crashing? If it crashes, select the check box and write a brief description. A crash automatically ends your review.

### Prohibited Content

By opening up Marketplace to user-generated games, we are placing a high level of trust in our creator community. Reviewers must verify that the content does not contain any of the following prohibited content. If you are unsure as to what we mean by a particular descriptor, click the blue help icon for guidance.



If a game containing prohibited content enters the system, we will take it down from Marketplace, revoke it from the console, and then follow up with the reviewers and creators who allowed it to pass peer review. We reserve the right to

expel abusive members from the XNA Creators Club, ban their accounts from Xbox LIVE, and change their review reputation — depending on the severity of the violation. Sharing XNA community games is a privilege. It takes only a few bad apples to ruin it for everybody. We can't emphasize enough how important your role is as a peer reviewer and responsible creator. Use the beta to set the tone for a responsible community. Enough said.

### Classification

If you decide the game is appropriate, you must classify it. Classification defines the content of the game, and higher content descriptor values do not restrict the game's distribution. We expect a variety of games with classifications from 0 to 3 in all categories on Marketplace. For the United States, we have descriptors that belong to three categories: Violence, Sex, and Mature Content.

Move the sliders for each descriptor according to your experience. Please give us your feedback on the classification categories and descriptions. The exact values and descriptors may evolve to better reflect the game or the consumer experience. Note that the game creator owns the classification. If enough peer reviewers disagree with the author's classification, the game is rejected and the author should adjust the classification to better reflect the content.

### Summary

You are almost done. Double-check your work on the summary page, and then click **Submit Review** from the summary page.

### Rejected!

Games that do not pass peer review move to the rejected state. Provide the game author with a helpful explanation in the comments section of



Click the **Get Code** button to reveal your single-use code. Don't give it to anyone else! Once you acquire the code, redeem it from Marketplace to acquire the XNA Game Launcher. Once you have downloaded the launcher, you can access community games in Marketplace, and then download and play them.

## What's Next?

You've learned how to prepare your game for distribution, how to peer-review other creators' games, and how to download the games to your console once they appear on Xbox LIVE Marketplace. Congratulations! You may be on your way to fame in

the summary page. Including comments enables the author to fix the game quickly and put it back into peer review. A release in the rejected state can either be deleted or revised by the author. If a release is revised, it moves to the pending state so that the author can correct the issue before resubmitting for review.



## Play!

You'll receive an e-mail after the peer review process. If your game passed, congratulations! You just

got your first game on Xbox LIVE Marketplace! If your game was rejected, review the comments from your peers in the e-mail. You can always fix the issues and resubmit. If you think that you were unfairly reviewed, let us know.

## Acquire the XNA Game Launcher

To play community games in the **beta**, you need to acquire the XNA Game Launcher from Marketplace. The launcher allows you to run community games. You'll need your beta code to acquire the launcher. Premium members can find the code on <http://creators.xna.com> in their profile page.

Holiday of 2008! We encourage you to get out there and kick the tires of our new site and beta of the community games distribution system. Please send us your feedback on all aspects of the new site — from the new look and feel to the games catalog. We want your thoughts on your overall experience. Does the classification system make sense to you? Is it easy to peer-review games? What things could we do to improve the overall process? Even if you are not yet ready to submit a game, check out the new site. We'll be updating it frequently with new samples, news, and other content.

With your help, we can achieve our goal of democratizing game development and distribution. We are building a lightweight and scalable distribution platform for community-created games. We want to ensure that *all* creators can participate in game development. At the same time, we want to protect intellectual property rights, both yours and those of others. Above all, we want to provide a safe environment for game players while giving them a broad set of choices that only an entire community of creators can provide. So, creators ... start your imaginations! When we release version 1 to the world, just think: You'll be able to reach an audience of millions.



# Evolve at SIGGRAPH2008

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FINAL FANTASY  
CRYSTAL CHRONICLES:

MY LIFE  
AS A KING

GAME DATA



DEVELOPER Square Enix

PUBLISHER Square Enix

NUMBER OF FULL-TIME DEVELOPERS 7

SHARED TEAM MEMBERS 12

PRE-PRODUCTION 4 months

DEVELOPMENT 13 months

SQUIRREL CODE 113,599 lines

C++ CODE 53,075 lines

**WIWARE OFFERS A UNIQUE PROCESSING** power to game data size ratio. In all other platforms, processing power and data size scale proportionally. However, WiiWare comes with more processing power than previous generation consoles, but only a thousandth of the memory space allotted for game data. WiiWare downloads also have a price range set higher than cell phone games and casual games, but lower than console games or even handheld games. What kind of game can be made with this and how can we make it? FINAL FANTASY CRYSTAL CHRONICLES: MY LIFE AS A KING was our answer.

The development of MY LIFE AS A KING was about starting from a very large team approach, with which we were familiar, and figuring out what to keep and what to throw away. The process involved relearning some of the basics and fighting with some of the old ways that had worked so well.

**WHAT WENT RIGHT**

**1 USING A LIGHTWEIGHT LANGUAGE ... HEAVILY.** At Square Enix, we usually allow planners (which are similar to game designers in North America) to use lightweight languages or scripts to implement cut-scenes, which we usually refer to as events. Programmers at Square Enix only use assembly, or C, or maybe

C++, because using scripts would not achieve the best performance from the hardware. What is not considered, however, is flexibility.

We knew that MY LIFE AS A KING was going to be a different kind of game compared to our usual titles. So for our development process, we wanted to have flexibility above all else, and we hoped to gain that by relying on a script language. We knew that many other developers employed Lua or Python, but after a little bit of testing, we decided to use Squirrel.

In MY LIFE AS A KING, all the engine aspects are implemented in C++. This includes graphics, sound, collision detection, camera, and data IO. Everything else, such as AI, user interface, game play, and cut-scenes are implemented in Squirrel. The actual main loop and all the transition control is also written in Squirrel. We tried to keep the C++ side as simple service functions that can be called from Squirrel to do computationally intensive tasks.

In bytes of code, approximately 89 percent of the code is in Squirrel and 11 percent in C++. In terms of CPU time, our C++ took about 85 to 95 percent. This is reasonable, considering this included matrix calculations, sound, and collision detection. In terms of RAM usage, the code and data instantiated in Squirrel used about 19MB. This was probably our biggest cost in using Squirrel. This 19MB represents

**FUMIAKI SHIRAISHI** is the lead programmer for FINAL FANTASY CRYSTAL CHRONICLES: MY LIFE AS A KING. His previous titles include FINAL FANTASY XI and FRONT MISSION ONLINE. He spends all of his free time running after his tireless two year old son. Email him at [fsiraishi@gdmag.com](mailto:fsiraishi@gdmag.com).







all of our nongraphical “game” data, which includes states for all of our AI, all the data for weapons, items, dungeons, monsters, cut-scenes, and elements of that nature.

19MB is a high price to pay, especially since there is not a lot to begin with.

All of our programmers agree that this game would have been completely different if it were not for Squirrel. The programming of MY LIFE

AS A KING required a lot of rewrites and a lot of throwing away. One of the benefits of scripts is that rewriting them is faster and easier.

There is also less of a psychological barrier in throwing away code. This actually makes a big difference. I know from experience that Squirrel code feels a lot easier to throw away than C++ code. The result is that I am a lot more open to game design changes when they are needed, and for this game, the small design changes made all the difference.

```
<monster>
  <label>moo</label>
  <vitality>3</ vitality >
  <strength>4</ strength >
</monster>
<monster>
  <label>worm</label>
  <vitality>4</ vitality >
  <strength>3</ strength >
</monster>
```

FIGURE 1 A sample XML format.

```
::MONSTER <- [
  {label=moo, vitality=3, strength=4},
  {label=worm, vitality=4, strength=3}
];
::MONSTER_MOO <- 0;
::MONSTER_WORM <- 1;
```

FIGURE 2 Squirrel code resulting from the XML.

```
Print("Name: "+::MONSTER[::MONSTER_WORM].
label);
Print("Vitality: " +::MONSTER[::MONSTER_
WORM].vitality);
>> Name: worm
>> Vitality: 4
```

FIGURE 3 Code to access the data from Squirrel.

**2 XML FOR EVERYTHING.** Almost all of our data was saved in XML format, at least in its intermediary phase. This XML file is then converted to either a binary file or a Squirrel script file to be used in the game. For example, the data for enemy monsters is created and edited in a large Excel spreadsheet. This data is then exported out to XML. From this XML file, we create Squirrel code which is compiled with the rest of the Squirrel code used in the game.

Initially, we experimented with reading the XML directly into the game, but this method turned out to be too slow. For our second approach, we tried converting all the XML into binary files, just like the 3D models, then reading these files and creating Squirrel instances. This was still too slow. Finally, we tried converting the XML code to Squirrel directly, and compiling it all in. This last approach turned out to be much faster, and also easier to debug.

Figure 1 is a sample XML file, and Figure 2 shows the Squirrel code that our converter will create with the sample. Figure 3 shows how we can then use the data in the XML file.

There were many benefits to using XML for everything. First of all, having a human-readable form for all data was useful during debugging. Second, our system helped us separate data and code. Oftentimes, programmers do get lazy, and place actual values or data into the code, making testing and balancing more difficult. Our unified system of accessing XML data from Squirrel made separating data and code easier for our programmers. To create data for use in the code, a programmer simply needs to write an XML file and press the convert button.



**3 THINKING OUT OF THE BOX, BUT STAYING WITHIN THE LIMITS.** We are often asked about the difficulties of creating a game that fits within the small download size limit. From a programming standpoint, there were moments when it was difficult. From a product development standpoint, however, having a download size limitation was actually helpful. The restriction helped us in two ways: by keeping our team focused, and forcing us to find ways to make the best of the resources we had.

When working on a disc-based game, where the game size is not really an issue, keeping the game focused depends solely on how the team is organized and managed. There is no physical limitation on how many ideas can fit in the game, and sometimes choosing which ideas to implement can be difficult. For us, the physical limitation was always present. We knew exactly how many character models and how many building models we could use. We also had a good idea of how much text we could fit and how many effects and how much motion data we could add. Loss of focus, a big problem in game development, was never an issue for us.

Another benefit to the size limitation was that we were forced to make the best use of what we had. Oftentimes, the question in game development is “What do I need to create this game?” For us, the question was “What game can I make with the stuff that I have?” One example is the job change sequence. Because we did not have room for elaborate graphical effects to be shown when a character changed jobs, we had the adventurer go home and change jobs. I personally think this turned out better than having cool particle effects. Another example is the whole personality system. The ability to give different personalities to adventurers started from simple ideas like having a work-out buff go to the training hall all the time, or a social adventurer go to the tavern each night.

The ideas that we are proud of in this game are not flashy and not particularly ambitious. Each of these ideas is just a detail, but a game’s true value often comes down to these little details. The size limitation forced us not to think about what more to add, and instead think about refining what we already had.

**4 BEING PART OF A LARGE STUDIO.** Being part of a very large studio can be a mixed blessing, but for MY LIFE AS A KING, we were able to use the studio size to our advantage. While we maintained a small core team, there were a lot of tasks along

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the way that required specialized skills. Being part of a large studio, we could ask for these skills just when we needed them.

Many of the art designers, for example, participated either part-time or only for a limited time period. The background designers worked on the game for three to four months, at the end of which they had completed all the buildings. The character designers, on the other hand, were part of the team for a longer period of time, but worked part-time for us while being mainly assigned to a different project.

We also received a lot of help from people who were never officially part of the project. One problem with working on a console game is the dearth of information on the Internet. In some cases, the platform holder's technical support team is the only source of information. In a large studio such as ours, however, we have access to people within the company working on the same console and experiencing similar issues. I posed a lot of questions to another programmer who was also working on the Wii platform and our background design lead spent time talking to other designers working on other Wii projects.

**5 SMALL TEAMS.** Small is relative, but by our company's standards, our team was very small. Our core team was composed of two planners, three programmers, and three art designers. We had many more people who came in to help, but only when their expertise was needed. There are definitely pros and cons to working with a small team, but for now I will talk about the pros.



One good thing about being in a small team is the shorter meetings. For instance, we had one programmer meeting per week, which was generally about 15 minutes long. In comparison, my previous project had weekly meetings which tended to last for at least an hour. The reason we could keep the meetings so short was because we did not wait for these

weekly meetings to discuss problems or disseminate new information. In our team, whenever there was an issue we got in a huddle immediately. In all my previous projects, it was often difficult to get everyone together, so we often had to wait until the next weekly programmer meeting. A faster turnaround can be achieved with bigger teams if managed properly, but it is definitely easier with a small team.

The biggest benefit of working in a small team is motivation. With our team, we had a sense of working together to create the product, rather than each of us working on our own little part. This is in contrast to a team that is divided into subsections, with each subsection given control over a certain part of the game. With our team, we all pitched in when something needed to get done. For example, we had a planner who ended up drawing our 2D art and also created particle effects. We were also all free to pitch in ideas regardless of what our roles were. Our project manager, for instance, was responsible for the original idea of displaying all battles in text format.

## WHAT WENT WRONG

**1 SQUIRREL SPAGHETTI.** Though we are happy having used Squirrel, we are not particularly happy with the actual Squirrel code. The root of our problems was that we did not design our Squirrel code properly. With C++, we have experience with the header structure and the inheritance structure, and all of the resulting intricacies. With Squirrel code, since it is much more flexible, we basically went crazy with it, and the code that we ended up with lacked modularity and resulted in a lot of problems.

One specific problem we had was the start-up time for the game being very long in debug mode. Toward the end, the start-up time was a little over 90 seconds long, which feels like forever when trying to fix a small bug. This problem was compounded by the fact that with Squirrel, simple typing errors can go unnoticed until runtime. Had we written a more modular code, we would have been able to construct a system where we could edit a module, reload just that module, and run the game. Instead of having to wait a minute or more for the entire game to start up, we would have been able to test changes immediately.

Another problem arose during the testing phase. Because we had a lot of simulations running in the background, there were a lot of bugs that had very little to do with what the player was doing at the time. Had we been able to switch modules on and off more easily, we could have had a better environment for isolating bugs.





**2 LETTING EVENTS RUN WILD.** One of the defining aspects of MY LIFE AS A KING is that for a simulation-type game, we have a very strong storyline narrated through cut-scenes, which we call “events.” While the benefit of this approach from a storytelling standpoint can be debated, for the purpose of this article I will talk about the technical issues we had.

The actual events were written by event planners, but in order for them to do that, we wrote a simple and flexible programming structure for them to use. An event can be triggered from a line of code embedded pretty much anywhere in the game code. An event is run on a separate Squirrel thread, concurrent with the simulation and with any other events that happened to be running. We did not place any more structural limits on events in order to keep them as flexible as possible.

As development progressed, however, the events started having interdependencies. Certain events needed to happen immediately before or after another. Certain game flags were turned on during an event to unlock functionalities at the right time. What we lost in this process was flexibility in game design. Because of this, some features that we previously could have put into the game became impossible to implement. One example of this is the ability to run the game on different city maps. Another example is a no cut-scene mode.

Compared to most other projects at Square Enix, the event planners were given a lot less resources and freedom to do their craft, and they still did a great job. As a team, however, we should have planned and organized events more carefully. For each event, there should have been a clearly-defined precondition and a post-condition, and the programming architecture would have

enforced that. Had we planned better we would have been able to implement good cut-scenes without losing flexibility.

**3 MORE AI! = MORE FUN.** One issue the game industry has always faced is that better graphics does not necessarily equal more fun. A close cousin to that concept would be that more AI does not equal more fun. I should have expected this, but did not realize it until rather late in the development process.

Very early in our development, the adventurers were governed much more by AI than in the final product. In the final version of MY LIFE AS A KING, the jobs and quests the adventurers choose are ultimately decided by the player. In an early prototype, however, the adventurers changed classes and went on quests without any input from the player at all. In fact, you could simply sit back and watch the AI beat the game for you. This was fun for the first 5 minutes, but became terribly boring after that.

We actually spent a lot of time removing AI and replacing it with player mechanics.

All of the machine-learning algorithms I had added were eventually taken out. What we aimed for was just enough direct control to make it a “game,” but enough automation so that controlling all the adventurers would not become a chore. The final product is less interesting from an AI perspective, but most likely a better game.

**4 NOT SEEING THE FOREST FOR THE TREES.** One of the buzz words in the industry is “iteration,” and we definitely tried to iterate parts of our game. However, we spent too much time iterating small parts of the game before





we knew exactly what the whole should look like.

Very early in the development cycle, for example, we invested a lot of time iterating our battle system and the battle report design. We thought at the time that the game would be fun if the battle reports were interesting. We focused on trying to make the battle reports as short as possible while also fun to read.

Two or three months after we thought we were done with the battle system, we finally had the rest of the game in place. That was when we realized that anyone playing this game was not going to read the battle reports. From our play testing, we saw that players read the reports only when they really had to, and even then only very briefly. Rather than needing to be fun, we realized that the reports needed to be easy to read at a glance. We ended up having to redo the battle system from scratch.

What we learned the hard way was the importance of being aware of the “big picture.” We wrongly assumed that if the battle reports were fun, then the whole game would be fun. We learned only afterwards that the battle system was only a small part of the player’s experience, and much of the iterating that we did turned out to be wasted. We were fortunate enough to have ample time to iterate some more once we did see the big picture, so iteration did prove to be important. The lesson learned was to not iterate a small piece of the game too early and just for the sake of iterating.

**5 UNDERESTIMATING.** The biggest mistake with MY LIFE AS A KING was that the initial schedule as a WiiWare launch title was much too short. The result was a project that was always in crunch mode and where all the wrong decisions were made.

In terms of programming, for example, 10 months before we finally shipped the game, we talked about throwing away a lot of our code to make the game more modular. We ended up not doing that because at the time we thought we only had three months left. Had we known that we had much more time, we could have invested in cleaning up the code, possibly resulting in a better product for less work in the long run.

In terms of game design, we decided not to do a lot of things because we thought we would not have enough time. An example of this is the inability to fire adventurers once a player hires them. We debated this for quite some time, but in the end we felt there were too many small issues we would have to address in order to add this to the game. We made a decision to not implement adventurer firing in August, assuming we only had two or three months of development left. Again, we were making assumptions on when WiiWare would launch, so had we known we had until Spring, we probably could have added this feature in.



However we really wanted MY LIFE AS A KING to be included in the launch line-up so we pushed ahead.

As the ultimate goal was to finish the game before the WiiWare launch, at the very least we did accomplish that. But if we had a definite timeline to follow instead of our internal milestones, we probably could have made much better decisions along the way.

## CONCLUSION

WiiWare, like many other download platforms, offers a market for medium-sized games—not as large as boxed games, but not as small as cell phone games or some of the simpler casual games. As the industry moves forward, the lines separating all these types of games will blur. As game developers, our challenge is to create the right game for the right platform for the right market, but in order to do that we need the skills, the infrastructure, and a development process flexible enough to adapt quickly. I am hoping that our project was a small step in the right direction. ❖



The FINAL FANTASY CRYSTAL CHRONICLES: MY LIFE AS A KING core team. Fumiaki Shiraishi is in the middle row, third from left. To his left is executive producer Akitoshi Kawazu and to his right is producer Toshiro Tsuchida.



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## INTERVIEW: MASAFUMI TAKADA

**BRANDON SHEFFIELD**

is senior editor of Game Developer magazine. His favorite Masafumi Takada soundtrack is *THE SILVER CASE*, though he has shamefully never played the game. Email him at [bsheffield@gdmag.com](mailto:bsheffield@gdmag.com).

**GRASSHOPPER MANUFACTURE SOUND DIRECTOR MASAFUMI**

Takada is the man from whom the inspired soundscapes of *KILLER7* and *NO MORE HEROES* spring. At times jarring, at other times serene, but never boring, Takada's soundtracks complement Grasshopper's irreverent and self-referential games perfectly. But his soundtrack work extends beyond Grasshopper, as his tunes are featured in Clover Studios' *GOD HAND*, and Sandlot's *EARTH DEFENSE FORCE* series, affording Takada the ability to experiment in a multitude of genres and game spaces. During a recent trip to Tokyo, I had occasion to ask him how he manages to create his unique sounds. Though he was not accustomed to thinking of his work in this way, he managed to drop a few hints as to what lies behind his aural mask.

**Brandon Sheffield:** Where did you learn music, and what instruments are you trained on?

**Masafumi Takada:** I started learning music at age 3 on a keyboard called the Electone. It was an organ-like keyboard from Yamaha. So I learned piano, and the brass band tuba after that when I was in high school. I'm from Aichi, which is near Nagoya—when I came to Tokyo, I started studying music for about six years, and got a degree.

**BS:** And how did you get into games from there?

**MT:** I wanted to make a living doing music ... and right around that time the transition from the Super Famicom to the PlayStation was going on. Music was changing from the blippy chip-tunes sounds to real music. And I really liked video games a lot, and basically just had some hope to eventually write music for games, and that transition seemed like a good time to break in.

**BS:** Adaptive music is not used very often in Japan. Why is that? Meaning music that changes with the state of the game. Rather than just—you walk into this area, and when you're in a combat mode, the music changes.

**MT:** Actually that is the sort of thing I want to do—for [early Grasshopper game] *THE SILVER CASE*, they did it. So, the sound ... It's a limited sort of interaction, such as a desktop computer in the game where you can see some data is just displaying on the screen, and depending on the state of the user, the soundtrack,

the music, the back ground music at the moment for the data you see on the screen would be changing.

**BS:** How much do you think music actually affects gameplay and the user experience?

**MT:** When you play video games, the game space is just what's on the front of the TV. But the rest of the space in your environment, the whole area around you, is completed by the sound. When games are built from the beginning, they're made without sound. And when you add the music and the sound, you're giving life to the game.

**BS:** So in a way you're creating the bridge between the user and the television, by filling the world around them? How then do you work to connect the player on the outside to the game that's just on the TV surface?

**MT:** I think about this a lot. Music is really tied to your experiences and memories, similar to how your sense of smell is. If you hear music that you've heard before, it should bring memories from that previous time rushing back. The game is of course a virtual world, where there are naturally things that don't have any relation to reality. But perhaps these experiences could happen to you in the future. The music will be tied to these potential future experiences. So I want to create music that will tie you to and remind you of the virtual world, but also come back to you in the real world, and create future memories. The soundtrack should recall your old memories, but also help forge new ones.

After you've played the game, when you listen to just the music, I want players to be able to remember the feelings they had at that time, and their feelings of that era.

**BS:** A lot of game soundtracks are very much in the background. But as you mentioned, there are soundtracks where you recall where you were and what you were doing at the time that you played that game. Most people don't make distinct themes anymore. You can remember *SUPER MARIO*, *CASTLEVANIA*, and *ZELDA*, but for the last 15 years you can't remember anything. However, in your music, I can hear repetition—*THE SILVER CASE* theme is used, and reused with variation, to the point where I can remember the theme right now. How do you go about creating that feeling; that some day people will say "Oh, I remember that time..."

**MT:** The technique I used in SILVER CASE is called the leitmotif technique. It's through this that I try to achieve that sense of nostalgia. The same technique is often used in operas, where a specific melody is used for a specific character. So the soundtrack selection is based on and coupled with the character in action. For example, you have two characters with separate motifs for each, if both characters appear at once, you would blend the two melodies. Using this technique in addition to SILVER CASE's main motif and theme, the tunes are rearranged over and over for each important point in the game.

**BS:** Jesse Harlin, the audio columnist for Game Developer magazine, recently wrote an article about techniques for making distinct themes. One of the techniques he described is taking a certain style of music and putting it in a genre where you wouldn't expect it. He says the themes you remember happen when you take an action game like MARIO and you put a waltz in it. Or the a cappella theme in KATAMARI DAMACY.

**MT:** Yeah, I think the shock factor and initial impact of the mismatch link directly to memory, so it's probably easier to remember a cappella used in KATAMARI DAMACY than the same a cappella applied to an emotional scene. To hear a cappella in a situation that fits a cappella makes less of an impact than hearing it in KATAMARI DAMACY—a situation that seems like a mismatch at first, that's probably why people remember.

**BS:** What other techniques do you use to try to make music distinctive?

**MT:** It's okay for me to talk about any title? So, NO MORE HEROES is structured to have smaller squad battles and boss battles. There's a specific melody that is used for the smaller squad battles throughout the game which is also used in the game trailer. The entire game, from the opening to the ending, is constituted by this one melody (hums). That single melody is rearranged in a variety of ways, with varying complexity. In the small squad battles, because lots of identical characters or enemies with the same look come out at once, by playing the main theme, you make a stronger impression of the NO MORE HEROES game itself on the players. On the other hand, because characters in boss battles stand alone and have a greater presence, I try to omit the melody and include music with less impact.

**BS:** I noticed that when you were thinking about your music, you did this [gestures as though playing keyboard]—can you actually play the keyboard without the keyboard?

**MT:** Oh, you mean like this (gestures)? I don't intentionally play air keyboard, but I do it for sure. Yeah, I do practice like this when I'm taking the train and stuff.

**BS:** How did you develop the very crisp-and-clean Grasshopper audio style? I'm talking whole sound design, because it all really works together.

**MT:** I'm just doing my best to make audio that matches the game. People often say that my sound effects have personality, but I'm not sure why.

**BS:** But certainly, you want to create your own style, right? So that people will know that it's yours.

**MT:** To the contrary, I don't think about that much. I don't know if you would call it compulsive, but when I put my hand to the keyboard, the colors of the sound composition just flow like it's a memory implanted in my spine. Instead of over thinking it, most of my work is compulsive; when I play a tune and the melody seems right, that's what I go for.

**BS:** In KILLER? you have sound design that brings you into the game, and then does something unexpected to push you out again, and make you realize, "OK, this is a videogame. I'm not 'in' this world. This is really a game." It's a very "game-like" sound. Most people are trying to make "movie-like" sound, which just envelops you, and brings you in, so you never remember what you're doing.

**MT:** For KILLER?, I actively asked the programmer to implement the game audio, so as I played the game I made lots of adjustments. All of the sounds that I don't want in the game were all omitted. I only kept the sounds that I thought were vital. Basically I match the scale and adjust sound effects to the specific setting; I sprinkle in sound effects in the same way I work with music; on the other hand, when I don't want to draw the user in, when I want to push them away, I intentionally tune and apply sounds that are slightly off pitch from the optimal adjustment.

**BS:** How do you decide when it's time to bring them in, and when it's time to make them feel uncomfortable?

**MT:** You must break through. Maybe you would call it a trial. Midsize bosses ... how would you put it ... if you defeat him you can move on to a comfortable place that just lies ahead. I want to do things like that. If you have nice music here, there are also uncomfortable moments, and then here you get good music again (gestures in an arc). So in order to get here, you choose to move forward through a thorny path. As long as there's a fluctuation in emotions it's good.

**BS:** For instance in survival horror games, like SILENT HILL, the sound design might make a player feel "Oh my god, I don't want to go over there!" but still you go, because you feel compelled. It seems a little more complicated than just hoping for something good in the future. Something about it makes you feel scared or uncomfortable but you have to figure out what that is, so you want to keep going.

Even in your own games it's a little deeper. And if it were an even pattern of bad, good, bad, good, that would be very predictable, but with Grasshopper games, it's like good, then surprise, and then maybe bad, then surprise, and then...

**MT:** That's true (laughs). If you have to name one example that's what it's like, but according to (Grasshopper Manufacture CEO Goichi) Suda's thinking itself, his main goal is to surprise users. So if you look at our project plans, gameplay is broken up by cutscenes and so forth, that's how KILLER? was made. We on the creating side are often surprised ourselves. Because it's Suda's game there's that flow, and the flow of the audio also needs to ... if there's a surprise here, you adhere here, sort of like that. That's what I think. From the developer point of view, I know there's a surprise here, so the key is how to rouse up the experience and take it to the next level, so immediately before I would take the audio down a notch and stuff, to create a wave (gestures). That's how I create the audio. ❖





## AUTODESK'S MUDBOX 1.0.7

By Tom Carroll

### I CAME. I SAW. I MUDBOXED.

As opposed to my first run in with Zbrush, which went more like this: I came; I stumbled; I gave up.

And I really wanted to like Zbrush because I saw what others were doing with it and I wanted to be like them. But I wasn't like them. I was like me.

Hey, confession is good for the soul.

However, I also confess that when I opened Mudbox for the first time, I didn't stumble. I created some really bad artwork and found that the interface was intuitive enough for me to do so right away.

Whether the artwork gets any better is anyone's guess. I never include spoilers in my reviews.

### GETTING STARTED

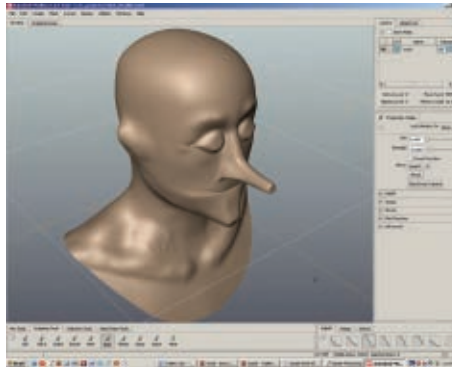
Installing and launching Mudbox was a breeze, and because the standard format uses native Windows color schemes and drop-down menus, my initial fear factor was minimal. I began with the 3D view (one of two tabs just below the command line; the other is Image Browser) and immediately created a sphere, chose a brush (actually, the Soft brush was already selected), and began to pull shapes out of the sphere like it was made of taffy.

Not bad, but not something you would call art, either.

Fortunately Mudbox comes with a selection of tutorial movies that give you just enough information to be dangerous. I viewed them, learned about

symmetrical modeling, 3D layers, curve railing guides, and other subjects, and then really began making some bad artwork. At least my hideous first starts were symmetrical.

But I always look for the positive, and by creating bad artwork right away I was able to quickly see that Mudbox's tool sets are organized well and the information I need is pretty much at



Mudbox lets anyone start building surfaces within minutes. The author's first minutes could have been spent more wisely perhaps.

my fingertips. For instance, the toolbar contains an array of brushes that instantly satisfy my needs. There are also translate, rotate, and scale widgets. To the right are areas that handle 3D layering, object properties (more information here than the paparazzi has on Britney Spears, as well as a tray containing Falloff, Stamp, and Stencil tabs—more about them later).

Luckily, the Undo (Ctrl+Z) and the New Scene (Ctrl+N) commands are industry standard. If you're like me, you'll be using them a lot until you can finally loosen the bolts on your training wheels.

### MAKING MUCHO MUD

In other people's 3D portfolios you always see these awesomely gnarled and pitted heads (that are usually frowning—the frown is, after all, the universal expression of creatures in 3D land). So I wanted to make one myself. Luckily, Mudbox comes with a standard Create/Mesh/Standard Head function, and before you could yell "grimace!!" I had a standard head in my 3D space.

As I mentioned above, the tutorials showed me how to establish bilateral symmetry on this standard head, so it wasn't long before I was happily distending the jaw, furrowing the brow, and mashing the cranium of Mr. Standard Head. But god is in the details, and that's where you end

up spending most of your training-wheel time: figuring out how to add appropriate detail by changing your brush type, brush size, and by using the various other tools—Pinch perhaps being the most valuable. Pinch is super valuable when you need to purse those lips, or pinch in the wrinkles so as to make them look appropriately wrinkly.

Unfortunately, god is also in the hands of the clock, so while I could spend three

### MUDBOX 1.0.7

★★★★

#### STATS

Autodesk, Inc.  
111 McInnis Parkway  
San Rafael, CA 94903  
<http://usa.autodesk.com>

#### PRICE:

Mudbox Basic (non-commercial use) \$299  
Mudbox Pro \$649

#### PROS:

1. A simple, intuitive interface.
2. Asymmetrical mirroring, a new feature, saves a lot of time in a production environment.
3. Local subdivision allows you to add detail only where you need it, which allows you to work faster.

#### CONS:

1. So much flexibility makes workflow organization a bit like Paris Hilton shopping via Internet; where to start?
2. Documentation is only available online, and it would be nice if more file types were available for import (I know, that's two ... sue me).
3. Video tutorials are tangential at best in their real world value.



## OUR RATING SYSTEM :

★★★★★ EXCEPTIONAL   ★★★★ GREAT   ★★★ FAIR   ★★ POOR   ★ UNFORTUNATE

lifetimes playing with all the tools in Mudbox, deadlines loom and I need to submit this review. Suffice it to say, once you get proficient in Mudbox, you'll have to set limits on yourself or your noodling will seriously cut into the time you spend knitting WORLD OF WARCRAFT-inspired comforters (and wouldn't that be a shame).

### STAMP COLLECTING

Mudbox comes with a complete set of stamps that can be used to add surface detail and texture to any surface in an incredibly short amount of time. While Mudbox allows you to import your own stamps, the ones it ships with are quite nice, especially when used in conjunction with one another. I got my best results when I combined various stamps, not only varying the stamp itself, but the size and depth as well. Nature is, after all, repetitive shapes working together in harmony through size and depth. Poetical, ain't it?

### NORMAL MAPS APLENTY

Alfred E. Neuman once said, "Why be normal?"

Well, in the video game industry, you will almost never be able to load one of your trillion polygon monsters into the game. So you'd better be normal. Normal mapped, that is. Mudbox uses a Texture Baking Tool to generate a high-resolution map that can then be reapplied to a low-poly mesh to give it that *je ne c'est quoi!* Naturally, when I created my first Mudbox normal map, I had to select which subdivision level would be used as the low-res mesh, and which one I was using to create the normal map (the highest, in this case).

Even though it takes Mudbox a while to create normal maps from complex geometry, the results are spectacular, and I shuddered to consider how long it would take to create them by any other method.

### BEST (AND WORST) OF THE BUNCH

While it is impossible to cover every aspect of Mudbox in a review of this sort, I must say that the application's best feature is that so much of it conforms to other applications that I already know. For instance, you scale the brush size up and down with the bracket keys, just like in Photoshop. Also, the various visual tools, like the falloff graphics, can be modified with splines and handles—again, very, very intuitive.

With every upside, there is a downside. In the case of Mudbox, I must say the tutorial videos, while informative, are maddeningly simplistic. The stage is set with a completely buff looking god-like person, replete with bulging chest muscles and ripped biceps, but when demonstrating the various brushes, the instructor simply runs them around on the chest to show their effect. What would be better would be to show at every turn how the brush could be used in a constructive way, like accentuating a nostril or brow, or pursing those lips I mentioned earlier.

### FINAL COUNTDOWN

The downside of Mudbox, especially for video game artists, is minor. It is as close to sculpting as sculpting can be. One last little detail: If you aren't using a pressure sensitive tablet with your Mudbox, you'd better stop off at the drugstore for a giant-sized bottle of aspirin. You're going to need it.

---

**TOM CARROLL** is a video game artist currently with a prominent game studio. He is a contributor to **myIPD.com**, an intellectual property portal that launches in July. Email him at [tc Carroll@gdmag.com](mailto:tc Carroll@gdmag.com).

## product news

### GDEBUGGER V4.1 ADDS GEOMETRY SHADER AND ATI SUPPORT

#### GRAPHIC REMEDY

The latest version of OpenGL/OpenGL ES debugger and profiler gDEBugger V4.1 has added geometry shader support. It allows developers to view shader object source code and properties, as well as edit on the fly. The new version also adds ATI performance metrics integration and supports the latest ATI driver performance metrics infrastructure. The package supports all OpenGL versions up to version 2.1 standard, and a large range of OpenGL, WGL, and GLX extensions. It runs on all current Microsoft systems, as well as Linux i386 and x86\_64 architectures.

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

### FACE ROBOT 1.9 FACIAL ANIMATOR

#### SOFTIMAGE

Softimage released a new version—1.9—of its Face Robot facial animation software that now

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includes an Autodesk Maya exporter. The exporter facilitates moving completed facial rigs and animation data from Face Robot into Maya and allows artists to integrate facial rigs created with Face Robot into pipelines built on Softimage XSI software, Autodesk Maya software, or between any other professional 3D animation software packages.

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

## VERSION 1.7 OF TORQUE GAME ENGINE ADVANCED

GARAGEGAMES

Version 1.7 of Torque Game Engine Advanced now includes support for high-

end video cards, plus shaders produced with third-party tools and post processing effects such as FSAA, HDR, glow, and bloom. In addition, the new version of the Torque Game Engine Advanced has rendering fallbacks to DirectX 8, plus game examples to allow users to quickly prototype and produce PC games.

The release also introduces MegaTerrains (64 sq. km and up) complete with full real-time editor support, a completely abstracted sound system (SFX), and several other usability updates and fixes. Torque Game Engine Advanced supports cross-platform development under a separate license with Torque 360 for Xbox 360 developers. [www.garagegames.com](http://www.garagegames.com)

## DAZ 3D RELEASES NEW VERSIONS OF HEXAGON AND DAZ STUDIO

DAZ 3D

Hexagon 2.5 provides a set of tools for modeling, refining, UV mapping, texturing, and previewing detailed 3D creations. Its freehand brush modeling capabilities provide a wide range of displacement brushes. Hexagon 2.5 includes a Sculpted Primitive Toolset that allows primitive objects created in Hexagon to be exported via Truevision Graphics Adapter (TGA) file format and utilized in SECOND LIFE. Also in the upgrade are DAZ Studio Bridge to Hexagon and Seamless Model Export, the first of which allows users to transfer models from DAZ Studio directly into Hexagon, adapt and morph the model, and then export back into DAZ Studio. Seamless Model Export enables designers to export Hexagon 2.5 models into any 3D rendering application.

DAZ 3D also added new features to its free 3D posing and animation software DAZ Studio 2.1 with a number of new features. In addition to Daz Studio's OpenGL Preview, 3Delight Render Engine integration, and Fast-Time Rendering via graphic card hardware, the update also includes new features, like Drag and Drop, Levels of Detail, and Sub Division.

With Drag and Drop support, designers can automatically fit hair and clothing to 3D figures. Levels of Detail allows designers to control the amount of polygonal mesh detail, while retaining universal compatibility of morphs, textures, and other accessories. With Sub Division Geometry, users can apply more efficient meshes while preserving high-resolution in 3D avatars and figures.

[www.daz3d.com](http://www.daz3d.com)

## Q MIDDLEWARE AVAILABLE FOR WII QUBE SOFTWARE

Qube announced that its modular framework-based game middleware Q is now available for the Nintendo Wii. The cross-platform middleware now includes capabilities such as background data streaming, arbitrary scene rendering algorithms and n-dimensional animation blending. It also features cross-platform data format and a background work queue.

Q supports special hardware features including custom shaders and platform specific APIs, having been designed to allow its databases and core APIs work on all platforms.

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

## MORPH-O-MATIC PLUG-IN FROM DI-O-MATIC

DI-O-MATIC

Di-O-Matic released its latest edition of Morph-O-Matic, a morphing extension that assists modelers, animators, and technical directors in creating complex morph setups and animations. The plug-in adds additional functionality, including faster morphing calculation speed, an enhanced user interface for animators, the ability to use modifier stack result as morph target, an Auto Reload Target per channel option, improved .mom file features, additional MaxScript commands, and malfunction corrections from the previous version. The extension supports the 2008 and 2009 versions of 3ds Max in both 32-bit and 64-bit.

[www.di-o-matic.com](http://www.di-o-matic.com)



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## » THE INNER PRODUCT

# IMPLEMENTING DETERMINISTIC PLAYBACK SYSTEMS PART 2

## I REALLY ENJOY A GOOD CUP OF TEA. ON

the surface, making tea is really easy: take some tea leaves, pour some hot water over them, and wait a few minutes. In practice, the difference between a bitter, undrinkable brew and a perfect cup of tea is all in the details; the type and amount of tea, the temperature of the water, and the steeping time all make a huge difference. A playback system for a game is very much the same. As we saw last month, the basic idea is really simple: Record all game inputs, make the game deterministic, and you get the same playback every time. Unfortunately things aren't quite that simple in real life. Just as with tea making, the secret to a perfect playback system is all in the details.

Let's look at some of the common problems that can trip up the playback system and what we can do about them. We'll warm up by starting with the easiest ones and work our way to the hardest ones.

## GAME VERSIONS

A playback of a game recorded with a different version is almost guaranteed to end up with different results than the

original version. Any minor tweaks to AI parameters, pathfinding algorithms, or just about anything is most likely going to generate a different game state. It doesn't even have to be a change in code either: adding a new character or moving a trigger volume will also cause different playbacks.

In general, you're best off avoiding using recorded inputs from previous versions of the game. Inserting the game build version at the beginning of the recorded game state file allows you to detect version mismatches during playback. If a mismatch is detected, you can either print a warning or give up on the state verification altogether. This check will be particularly useful if you're sharing recorded sessions across the office (perhaps through a bug database) and people are on slightly different versions.

The idea of recording a session in release mode (all optimizations enabled, few debugging checks in place), and playing it back in debug mode is very tempting. Unfortunately, mixing and matching configurations is almost guaranteed not to work. Middleware libraries will often have slightly different behaviors in debug and release, which will throw off playback right away. But most likely so does your own code, and often in ways you might not expect. For example, you might have different floating point rounding modes in debug and release. Or even a more subtle difference: depending on the optimizations you have turned on, in debug mode a float variable might be copied back to memory after each operation (which rounds it back to a float), whereas in release the program might execute several operations in a row on that value before writing it back to main memory and causing the rounding only once. The results are

going to be very close, but they'll often be cumulative and the simulation will quickly diverge.

As a general rule, treat debug and release builds as if they were different versions. Make sure to include which configuration it is along with the build number in the game state file so you can check for that as well.

## MEMORY STATE

Reading data from uninitialized memory is probably the number one cause of non-determinism in games. Uninitialized memory will contain whatever data was stored there before. That can mean anything from sane-looking values to total garbage. What's worse, they're going to change from run to run, so if your game ever uses the values contained in uninitialized memory, playback is not going to be deterministic.

The most common case of using uninitialized memory happens by reading a variable that was declared and not initialized. This mistake is easy to see when we're dealing with a standalone variable, but when it becomes a member variable hidden inside some class, it becomes a lot less obvious. It's also important to notice that this will only happen when we declare variables on the stack or we create them dynamically on the heap. For global and static variables, the C runtime takes care of initializing them all to zero for us.

Cranking up the compiler warning level to the maximum will allow it to catch some of the most obvious cases of reading uninitialized variables. For extra checks, I recommend a static code analysis program such as PC Lint. That's almost guaranteed to catch every use of uninitialized variables (along with ten thousand other things, some of them

---

**NOEL LLOPIS** recently gave up a steady paycheck, and decided to follow his lifelong dream of being an indie game developer. He keeps busy by pretending to do everything from programming and design to business and IT at *Power of Two Games*. When he was still getting paid, he worked on *THE BOURNE CONSPIRACY*, *DARKWATCH*, and the *MCHASSAULT* series. Email him at [nllopis@gdmag.com](mailto:nllopis@gdmag.com).

extremely useful, though most of them you probably won't care about at all).

Another common mistake is to read past the end of a valid memory area, such as an array. The values read from memory in that case are going to depend on where that array is, and what happened before. In any case, it's going to become a source of non-determinism, and it's a clear bug that should be fixed right away.

If you ever find that your game is deterministic in debug mode but not in release mode, start by suspecting access to uninitialized memory. In debug mode, a lot of platforms will fill the memory heap with specific bit patterns describing the memory status: allocated, freed, etc. Those patterns can be really useful to track down problems with memory allocations, but they also set memory values to a consistent state, which will make debug builds seem deterministic when they really aren't.

### POINTER VALUES

Unless you're working on a platform over which you have total control, and you have a very strict memory allocation scheme, you should probably never rely on the actual numerical value of your pointer variables. The pointer values will change from run to run, and will depend on what happened before, including what other programs were running at the time.

If you're puzzled at the idea of using the pointer values as part of the logic in your program (and you should be), you still need to watch out for this possibility. Some well-known, open source compression libraries rely on this technique by hashing pointer values. This means that two consecutive runs of the same program might end up with two slightly different results.

In general, it's considered a good practice to avoid using pointer values for anything other than dereferencing them and accessing the data they're pointing to. Making decisions based on their actual

numerical values is asking for trouble, and you can almost always achieve the same result by using offsets between pointer values (as long as you know they're coming from the same memory block), which have none of those problems.

### ASYNCHRONOUS FILE IO

This is where things start to get fun. A lot of games perform background loads while the game is running. Whenever the game detects it will need an asset, it initiates an asynchronous load. When the load is complete, the game is notified and, optionally, does some processing on that asset. There is no guarantee about when exactly the load will complete, which means that each playback has the potential to be slightly different.

If the background load just brings in more mipmaps for a texture, it's not going to affect the simulation whether it happened a frame earlier or a frame later. On the other hand, if it's loading a more detailed AI navigation path, it can definitely affect the position and state of AI units. Even if you're not loading data that affects the simulation, it's very useful to have asynchronous file IO work deterministically to catch bugs more reliably. For example, the game might crash if a background texture load completes the same frame as a line of dialog sound is requested. As any

“ A playback of a game recorded with a different version is almost guaranteed to end up with different results than the original version. ”

programmer who's ever had to debug a problem like this will tell you, being able to reliably reproduce that crash is worth a small fortune.

This can be easily implemented at the game level by buffering all background read completions. During recording and normal game operation, background read completion events are made available as soon as they happen. During playback, however, background read completion

events need to be available the exact same frame they happened in the original session. If the read finishes earlier, it is simply buffered for a few frames until the correct time. If the read hasn't completed by the time it finished in the original session, the game blocks until it's done and it's made available right away. That means that playback might be a bit choppy at times, while the game blocks for data to be read, but it will ensure that playback is fully deterministic. Notice that blocking the game while waiting for a read to complete is not going to affect subsequent frames with a larger delta time because we're also reading the system clock from the input stream.

### NETWORK DATA

What about online games? Our playback method has been concerned exclusively with local players. Playtesting and Q/A on online games is much more expensive and time consuming than single-player games because of the manpower required and the coordination necessary to set the games up. Wouldn't it be great to be able to replay a 30-person game that resulted in a crash without having to get 30 players again?

Data received from the network most definitely influences the game itself, so it's another input to the game. We could treat all network traffic like any of the other inputs—record it along with the other game input and play it back by inserting the network packets as if they had come from the network card. That would work, but it's a bit more complicated than it has to be. Fully emulating the

network traffic, connection status, and everything else can be a bit tricky to get just right.

A simpler approach consists of translating the data received through the network into higher-level game actions. For example, whenever a player fires a weapon, it results in a network packet, which is translated into a game-level action whenever it's received. Then, the local simulation applies the action that



causes that player to fire locally. You probably already have a system like that in place in your multiplayer game anyway. Recording those actions is a much simpler task than the raw network traffic, and playing back a recorded multiplayer game is just a matter of inserting the game-level actions at the same time they occurred, just like any other input.

The game input file is going to grow significantly as soon as you start recording all the actions created by the players through the network. Fortunately, most games are extremely careful to minimize network bandwidth, so the input file will remain at a reasonable size even recording all that data.

### THREADS AND MULTIPROCESSORS

In today's games, multithreading is an inevitable reality. Even if your code isn't explicitly multithreaded, parts of your engine and middleware are probably using multiple threads. The problem with threads is that you never know exactly when one thread stops working and another one resumes. So it is possible that two events in two different threads will happen in different orders in two runs. To make things even more fun, most of today's platforms have multiple cores, making determinism even more complicated. Do we need to give up determinism in a thread-dominated world?

The totally honest answer is that we've already picked all the low-hanging fruit. If you really want your game to be 100 percent deterministic while running in multiple threads over multiple cores, get ready to roll up your sleeves and do some serious work. For the rest of us, we can still get most of the benefits of a playback system without total determinism. That means that there is potential for bugs caused by thread interactions that might not be repeatable from run to run. But at least the game simulation will be the same for every

playback, so the recording technique should still be very useful.

In the easiest case, the simulation runs on a single thread, with the rest of the threads dedicated to graphics, sound, and other systems. If we apply all the

“**In today's games, multithreading is an inevitable reality. Even if your code isn't explicitly multithreaded, parts of your engine and middleware are probably using multiple threads.**”

techniques we've covered so far, the simulation itself should be deterministic and we shouldn't have to do anything different than we did in the single-threaded case.

However, as soon as the simulation is spread across multiple threads, we need to be a lot more careful. Even if we have no control over the thread context switches, we can at least ensure that major events happen in the same order no matter how they were executed. For example, if a worker thread creates a set of actions to be executed, we can sort those actions before processing them. If that's not an option (because those actions are processed as soon as they are created, for example), we could record the creation order as part of the input recording, although enforcing that order during playback might have far reaching consequences for many systems deep inside the game.

If achieving 100 percent determinism in a threaded environment is important to your project, have a look at Replay Director. It's a commercial tool and set of libraries that gives you very accurate recordings and playbacks of your game, including thread context switches, with little extra programming on your part.

### MORE THAN JUST FOR DEBUGGING

At this point, if you've applied all the techniques we've discussed so far, you should have a pretty bullet-proof recording and playback system:

lightweight, reliable, and accurate. It will be a great help as a debugging tool, but there's no reason to stop there.

You could use the same system to record demo sequences to show off in presentations without the need to make a movie capture and degrade the image quality. You can also truthfully claim that it's a live demo, running on the game itself, not a canned movie, which carries extra weight with most audiences.

You can even integrate the playback system as

a key feature in your game. HALO 3 already does this by allowing you to replay any play session, examine what happen exactly, and let you take screenshots of the juiciest moments. It can be a great feature for a lot of games for almost no extra effort over what you've already implemented. The main problem will be to make sure future updates to the game don't affect the playback of older gameplay sessions. This is really hard to achieve, since the most insignificant change can end up causing the simulation to diverge in unexpected ways. So if you're going to rely on it as a game feature, you need a suite of comprehensive tests verifying that nothing changes whenever the game is updated. Last month we saw how to verify that a playback results in the same game state as the original session, so again, there's very little extra work there.

With all these techniques in your toolbox, you should be able to make your game pretty close to 100 percent deterministic—enough to have a solid playback system and use it to its fullest during production, and maybe even as a game feature. ❖

### RESOURCES

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STEVE THEODORE

## PIXEL PUSHER

# RENAISSANCE FAIR

**WE WORK IN SUCH A WHIRLWIND OF** technological change—new platforms, new software, new graphics tech—that it's easy to get fed up. It seems like every

time you master a tool, or have a workflow down to the point where you can forget the technology and really focus on the art, the rug gets whipped out from under you again and you're back to playing "where's that menu?" The nostalgic appeal of an earlier day

when an artist could focus on nothing but perfecting the craft is powerful—wouldn't it be great if it were just me, a sheet of paper, and a mug full of pencils?

Is there anything we can do to make the keeping-up-with-the-times part of the job less of a burden? Absolutely. It's actually pretty simple. In fact, it's positively pre-modern. But to explain it, I'd like to take a little detour into—ominous music please—art history.

Artists have been coping with changes in techniques, tools, and tastes for a long, long time. The granddaddy of all platform transitions is really the Renaissance, where centuries of tradition and technique were rendered obsolete in a few short years. Compare the two

images in Figures 1 and 2. They are separated by only a few decades in time, but they are worlds apart in execution. It's not that the anonymous artist of the first picture isn't good—he's great. The composition, the color choices, the expressions of the figures, and particularly the draperies are all handled with great flair. But the physical space is a jumble that completely fails to fool the eye. The second picture, Piero Della Francesca's *Ideal City* shows serene mastery of the physical spaces which so baffled the earlier artist. What's more (as you can tell from the title) it's completely invented, not drawn from life. Somewhere in the intervening years the standard "technology" of painting has undergone a revolution a lot more complete than the transition from the PlayStation 2 to the PlayStation 3. The history of that transition can actually tell us a lot about our own process of continuous revolution.

One of the significant differences between these two pictures is the fact that we know the name of one

you don't work with!) Unfortunately for us, Medieval humility doesn't go down quite as well anymore. A handful of developers have tried to step into the limelight either as individuals or strongly branded studios, but most of us are no closer to being rock stars than we were four years ago, when Jason Rubin told the audience at DICE that developers needed to become celebrities if we were ever going to get a fair shake. Alas, we're still stuck in the Guild tradition whether we like it or not.

Besides anonymity, the Guild system believed in secrecy. In an age without patent protection or copyright, you didn't go blabbing about your great new inventions—you kept them under lock and key. We're also unduly addicted to secrecy. It's understandable when it comes to companies, but it's all too common among individual artists—I've known otherwise grown-up professionals who would actively try to prevent their colleagues from seeing them in action for fear of other people learning their



**FIGURE 1** This manuscript illustration from the middle of the 15th century is the work of a highly skilled artist, but one who hasn't got a systematic understanding of spatial relationships. Probably by the Maître de l'Échevinage, France, around 1450.



**FIGURE 2** Piero della Francesca's *Ideal City* (1470) is not only a tour de force in graphic perspective—it's also entirely imaginary, done without any reference at all.

of the artists. The best or worst thing about the medieval Guild tradition of art—depending on how you think about it—was that it was a collective enterprise. If you marvel at the architecture of a gothic cathedral or the elegant menace of a good suit of armor it's unlikely you'll ever know who did the work; in contrast to our modern notion of the artist as a lone genius with unique personal vision, the medieval world preferred artists who worked collectively, in well-understood genres. In this regard the games business is definitely still in the Dark Ages (Quick! Name four game artists

special techniques. The limitations of this kind of thinking become really obvious when you come to the other big thing that separates our two paintings, namely, the invention of linear perspective.

### A BIT OF PERSPECTIVE

Most textbooks credit the discovery of perspective to Filippo Brunelleschi (1377–1446). Brunelleschi (see Figure 3) is an amazing character who combines many of the same contradictory traits you see in a games artist—artistic vision and technological savvy, creativity and hard-nosed

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**FIGURE 3** Filippo Brunelleschi, the secretive inventor of linear perspective. Portrait by Calvacanti, 1446.

business sense. His consuming passion was building the great dome of the Cathedral of Florence, which had been baffling generations of architects for over a hundred years before his birth. He tackled the project with flair and ingenuity, not just designing a new dome but inventing a new kind of scaffolding and a series of innovative machines

for hauling the 37,000 tons of bricks needed to complete the project. He even invented the catering truck as a way to keep his workers from drifting away from the job site at lunch time.

How does perspective enter into this? As Brunelleschi trained himself up to tackle his great project, he made a systematic study of every major Roman ruin he could find. Not surprisingly, this led him to a careful study of the relationship between the three-dimensional reality of a building and its two-dimensional form on paper. For centuries artists had used a grab bag of tricks to convey the illusion of depth—foreshortening, converging lines, and occlusion are all old tricks; what Brunelleschi did was to work out a method for bringing them all together. And he did it with exactly the sort of trick you might expect from a games artist—by what amounts to a hack, the pencil and paper equivalent of your favorite backdoor Max shortcut.

Brunelleschi's hack was based on the idea that a painting worked like a window—if you painted a “correct” view of a subject and held your painting out at the right distance from you, you’d see it seamlessly blended into the background. The problem, of course, is that what you see through a window depends on where you are standing when you look out; moving your eye point means changing the entire image. This is why the people in medieval art are usually rendered so much more believably than the buildings—in a world without cheap

drawing paper, portable easels, and pre-mixed tubes of paint artists rarely—if ever—painted outdoors, so outdoor scenes were usually done from memory or by assembling sketches. People, on the other hand, could be drawn from life. Brunelleschi's breakthrough solved both the problem of the moving view point and being stuck in the studio at the same time. Since he was in charge of the construction on the Duomo, he had a lean-to built where he could work on a painting of the Baptistry across the square from the construction site. As he painted there, he used a clever trick to force himself to keep to a single point of view. He cut a small hole in the middle of his painting. Periodically he would run around behind the painting, with his back to the Baptistry and peek through the hole at a mirror behind his chair. Seen in the mirror, the painting was held up against the real thing so he could make sure that it registered properly against the surroundings (in addition to the invention of perspective, he also deserves credit for the invention of match-moving 550 years before SynthEyes).

#### HOW YOU LOOK AT IT

Naturally, Brunelleschi's discovery was revolutionary, and his contemporaries were amazed at his skill in rendering 3D spaces on paper. And yet there were

remarkably few imitators—in fact, only Brunelleschi's close friends Donatello and Massaccio seem to have followed his methods. Why is that?

Brunelleschi was a guildsman, and like any good guildsman, he believed in the value of what we would call “intellectual property.” He was known, for example, to deliberately leave key pieces out of the models he built for prospective architectural clients so that nobody could use them to complete his commissions without him. So he did what any guildsman would do with a great discovery—he made showy demonstrations to impress potential clients, but he didn't give away trade secrets. As a result this enormous discovery had very limited impact during Brunelleschi's lifetime, and the revolution in art that perspective brought was postponed for a generation.

It took a very different kind of artist to transform perspective from a proprietary feature into a basic tool for working artists. Leon Battista Alberti (1404–1472) was not a driven genius on the order of Brunelleschi. What he could do, however, was to filter Brunelleschi's discovery through his training as a mathematician and, more importantly, as an author. His book *De Pictura* (1435) was the first “tutorial” for artists interested in perspective. It was a runaway success and soon became



**FIGURE 4** *The Delivery of the Keys* in the Sistine Chapel, 1482. Once Alberti had popularized perspective, it became a necessity for most working artists—including those, like Pietro Perugino, who sometimes put showing off their perspective skills ahead of actually telling stories or composing pictures.



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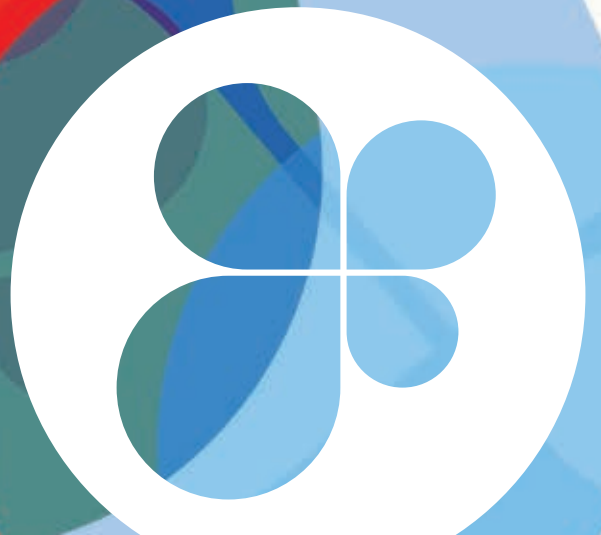
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**FIGURE 5** From scientific curiosity, to gimmick, to art: Raphael's *School of Athens* (1510) uses perspective as a powerful tool rather than a mere device.

a necessity for serious artists. The impact of the book can't be overstated. Brunelleschi's discovery was basically a great gimmick—it was an effective advertisement for his own genius, but it didn't start a revolution in art. Alberti's great achievement was to demystify the great secret and turn it into a formula that other artists could apply easily (see Figure 4).

The rest, as the saying goes, is history. It is amusing to notice how some aspects of the artistic character don't change—for example, the tendency to go overboard with new toys. Della Francesca (from Figure 2) was one of many artists who preferred flaunting their perspective skills to actually depicting the religious scenes or noble patrons they were commissioned to portray, and it's hard to escape the feeling that perspective was to the late 15th century what HDR bloom is to the current console generation. But it didn't take long for artists to turn this purely technical accomplishment to the service of real art—challenging and engaging the viewer. In a picture like Raphael's *School of Athens* (1510) (see Figure 5), the command of perspective is central to the whole enterprise—the framing of the scene and the mastery of the space pulls the viewer into the scene so physically, it underlines Raphael's passionate attempt to unite his own day with the classical past. It's still brilliant

today, but it's almost impossible to imagine the impact of such an image in a world without photographs or video. It transcends technique—but without a community of artists sharing technical knowledge it would never have been painted.

### GUILD WARS?

Escaping the guild mentality isn't easy, particularly for artists. Giving away your best tricks requires nerve—not just because you're divulging secrets, but also because you're opening yourself to critiques if people don't like your methods. If you can make the leap, though, remarkable things can happen.

First, on the purely practical level it's probably going to be good for you. Spreading your techniques around is, let's be honest, a good advertisement for your skills. If you're known around the office as the one who consistently comes up with faster, more fun, or more impressive approaches you'll be a much more valuable commodity. It's a good way to get noticed if you're hungering for a lead role or more creative input. It's also going to help your standing with your fellow artists, as long as you handle it diplomatically. Being a dogmatist about something as personal as art technique is only for the kind of artists you see in movies, the ones with berets and unplaceable accents who like to wave their arms a lot. In a collegial endeavor like games, that act gets old fast.

Beyond the practical benefits, opening up about your little secrets is also the right thing to do. The life of a CG artist is incredibly frustrating—we've got to face all of the classical conundrums of the working artist (creative blocks, the demands of commerce, and an entire internet full of critics) and we've also got to get our jobs done with these damn computers that seem determined to get in our way. It's got its glorious moments, but it's not easy. One of the few real tools we have for improving our working lives is community. If you follow any of the livelier art forums on the web you can see how powerfully the sharing of tips and techniques can change the whole industry. Packages like Zbrush, for example, could never have broken into the mainstream without the mutual support of a lot of artists swapping tips on sites such as ZbrushCentral or Spiraloid. Elite courses like Animation Mentor shape our understanding of animation through critiques and hints from fellow students and not only from sage advice handed down by instructors. Wherever that kind of exchange flourishes, we all benefit.

Of course, not everybody is going to be out there discovering tidy little nuggets of technique that can be passed around to others. For every artist who discovers a neat trick that can be shared, there are probably half a dozen too focused on their creative aspirations—or on meeting their deadlines—to offer advice to their teammates. Still, these folks benefit just as much—indeed, even more—from openness. The skills it takes to discover a better way of ripping normal maps or working around some limitation in Biped aren't always the ones needed to turn that discovery into great art. We remember Alberti, after all, as the popularizer of perspective—but we remember the work of Raphael and Michaelangelo and Leonardo which wouldn't have been possible without the discipline he taught. Whether you see yourself as a discoverer, a teacher, or just a working artist, you can still benefit from a little more of the Renaissance and a little less of the Guild in your work. ❖





SOREN JOHNSON

## DESIGN OF THE TIMES

# 2D vs 3D

## Choosing the Right Camera System for Your Game

**THE INDUSTRY'S FIRST VIDEO GAMES**—PONG, ASTEROIDS, SPACE INVADERS—were all 2D by necessity. A few early games experimented with basic 3D, such as BATTLEZONE's vector-based tank simulator, but these games were simply interesting footnotes, not the mainstream. Everything changed in 1992 with id Software's WOLFENSTEIN 3D, which popularized 3D as the leading edge of game development. Since then, almost no corner of the industry has been left untouched by the transition from 2D to 3D graphics. Almost every franchise, from MARIO to ZELDA to even PAC-MAN himself, has tried out 3D technology.

Now that this transition is essentially complete, it may finally be a good time to ask ourselves what we have learned in the process. What are the advantages of 3D? What are its challenges? For what is 2D still best? Perhaps game developers can now at last choose the best graphics environment on a game-by-game basis instead of making the move to 3D just from competitive pressure.

### TROUBLE WITH CAMERAS

3D games and cameras have a long, troubled history. While first-person games are essentially a solved problem for 3D, most other genres are still adapting to the new technology. Teaching the player how to use a camera while

also teaching the game's core experience can be a tough challenge. One distinct advantage 2D games have is that the easiest camera to teach is one which "doesn't exist" so to speak. In fact, 3D games have been trending away from giving the player extensive camera controls.

SUPER MARIO 64 is credited with being the first successful 3D platformer, but



The 3D camera view in Blizzard's WARCRAFT 3 is carefully restricted to help players keep track of the onscreen action.

it required the player to make extensive use of the camera controls to keep Mario visible and heading in the right direction. Platformers attempted more intelligent camera systems over the years, trying to dynamically determine the best perspective at any given time. Such solutions are bound to fail at some point, such as when the character gets stuck behind a corner or under a ledge. To solve this sticky problem PRINCE OF PERSIA: THE SANDS OF TIME introduced two alternative static camera perspectives that the player could access at any time. GOD OF WAR took this approach a step further and enforced a single fixed camera for each of them game's scenes, approaching the level design almost like a film cinematographer would. SUPER MARIO GALAXY has a dynamic camera without any controls whatsoever, although it adopts a nearly top-down view to enable the player to always see the surrounding area.

Strategy games have also gone through a progression of camera systems, similarly trending toward taking camera controls away from the player, or at least hiding them from the novice. STAR WARS: FORCE COMMANDER, one of the first 3D RTS games, had an infamously difficult free camera, which made finding the right angle to view your troops a

constant chore. WARCRAFT 3 may be considered the first RTS to get 3D right. The designers achieved this feat by greatly restricting the camera's freedom—the zoom range was minuscule, the pitch angle came directly from zoom, and the only camera rotation was attached to an obscure hotkey. In the book *Game Design Workshop: Designing, Prototyping, and Playtesting Games* by Tracy Fullerton, Chris Swain, and Steven Hoffman (CMP Books, 2004) lead designer Rob Pardo describes the process behind these restrictions:

"With 3D, we decided to bring the camera down quite a bit and try out some things. The problem was with the camera pulled all the way down, it became a pseudo-third-person experience. It was disorienting when you went around the map, and it was difficult to select units in battle because your camera frustum was pointed in one direction so you didn't have a good view of the battlefield. It was a challenge because we still wanted a fun strategy game. Eventually we pulled the camera into a more traditional isometric view, and that's when we really started making progress."

### BUT WHICH 2D?

Not all 2D games are the same. Two major styles have developed: "classic" 2D, which is a straight top-down (chess/checkers) or side-on (SONIC games) view, or isometric 2D, which tries to fake 3D with an isometric projection at a pre-set angle. Before making the full jump to 3D, many genres made a move

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from classic 2D to isometric 2D as an intermediary step. For example, the original *CIVILIZATION* had a traditional top-down grid view while *CIVILIZATION 2* had a three-quarters isometric view. While this new perspective gave the game world a more life-like appearance, the change did come at a cost to the user's game experience. Namely, distances are much more difficult to judge on an



**ADVANCE WARS: DAYS OF RUIN** uses a traditional top-down chess-board view.

isometric grid, as the east-west axis takes up twice as many pixels as the north-south axis. To solve this problem for *CIVILIZATION 4*, our 3D perspective actually hearkened back to the original game, as we showed the game's grid straight ahead and not at an angle. The easier the players perceive the grid through the graphics, the better they can "see" their possible decisions.

It is significant that *ADVANCE WARS: DAYS OF RUIN* (DS), the latest version in this long-running series, has maintained the traditional chess-board view, keeping the player focused squarely on the



**AGE OF EMPIRES: THE AGE OF KINGS's** isometric view can make unit selection confusing.

core gameplay. The "chunky" unit art familiar to the series is a great example of an artistic style which flows from the limitations of the game's presentation. In contrast, a game heavily influenced by the *ADVANCE WARS* series—*AGE OF EMPIRES: THE AGE OF KINGS* (DS)—chose to move the same game mechanics into an isometric 2D world. The transition was not altogether successful. Not only was the immediacy of the grid harder to follow, but because units extended beyond the edges of their tiles, selecting units and locations became a significant problem when groups of units overlapped one another. Thus, tile-based games tend to be more successful when a top-down view is adopted.

## GRAPHICS ARE NOT GAMEPLAY

3D graphics are not the same things as 3D gameplay. For example, two sci-fi RTS games—*HOMEWORLD* and *SINS OF A SOLAR EMPIRE*—use very similar 3D engines to recreate the vast scale and special effects of deep space combat. However, they do not share core gameplay, as *HOMEWORLD* is a "true" 3D game, meaning that ships could be moved freely along the z-axis, while *SINS* actually has 2D gameplay as the game is played on a single flat plane, meaning that ships cannot fly above or below each other. In fact, the game could have been implemented with a 2D engine; using 3D was a secondary choice to enable smooth zooming and to evoke the "feel" of outer space. The team's decision to adopt 2D gameplay saved *SINS* from the interface complications of *HOMEWORLD*, which required two or three separate clicks to give units a destination in all three dimensions.

Many other examples of hybrids exist, where games use 3D graphics to render essentially flat 2D gameplay. *SUPER SMASH BROS. BRAWL*, for example, is fought on a single, vertical plane that uses the 3D engine for the all-important animations and fluid background environments. Cliff Bleszinski has described the gameplay of *GEARS OF WAR* as a horizontal version of the classic 2D platform *BIONIC COMMANDO*. Instead of using the grappling hook to ascend from platform to platform, *GEARS* players "jump" from cover point to cover point along a horizontal plane.

Essentially, most games can be divided into three play mechanic categories which are related to but somewhat independent from the graphics:

- Tile-Based Games (*TETRIS*, *PUZZLE QUEST*, *CIVILIZATION*, *OASIS*, *NETHACK*)
- Single-Plane Games (*STARCRAFT*, *MADDEN*, *GEOMETRY WARS*, *SUPER MARIO BROS.*)
- Real-World Games (*PORTAL*, *SUPER MARIO GALAXY*, *BURNOUT*, *BOOM BLOX*)

Good rules-of-thumb exist for each of these categories. Real-world games essentially require 3D graphics. Of

course, the term "real" is not meant to be taken literally. The gun from *PORTAL* is not real, but the user enjoys playing with it because of the expectation that its unique behavior exists in harmony with the physics and gravity of our own world. The easiest way to guarantee that the player bring along assumptions from the real world is to immerse them in a 3D environment that looks, behaves, and feels real. These environments are the equivalent of what-you-see-is-what-you-get for games.

On the other hand, tile-based games usually work best as top-down 2D games, with little separating the player from the core game mechanics. For single-plane games, the choice comes down to largely one between aesthetics and technology. Can the game's platform support 3D graphics smoothly? Does 3D provide an advantage, from either shared animations or dynamic effects or general flexibility, that makes the technology worthwhile?

All in all, 2D is an underrated style that is often unfairly ignored as an old technology. Developers should not underestimate the advantages of avoiding the technical overhead of



**The Sulake Corporation's HABBO HOTEL.**

maintaining a bulky 3D engine and asset pipeline. Furthermore, well-made 2D graphics never really go obsolete. Sulka Haro, lead designer of *HABBO HOTEL*, likes to point out that their retro 2D style looks just as good today as when the game launched eight years ago. If they had used 3D, *HABBO* would probably be on its second or third engine by now. Once a 2D engine is up and running, the artists can focus on simply improving the game's look piece by piece. If 2D helps clarify and communicate the underlying game mechanic, then all the better. ❖



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JESSE HARLIN

## » AURAL FIXATION

# THE POWER OF THE SUNG WORD

**CAVE AB HOMINE UNIUS LIBRI IS A LATIN** proverb that means “beware a man with only one book,” and when sitting down to write choral music for entertainment media, it’s the Latin texts that composers usually reach for first. Rather than crafting meaningful text, many pieces of choral music for games or movie trailers contain a hodge-podge of random

words or disconnected phrases. For the most part, this seems to be due to tight deadlines, a Latin-illiterate audience, and a general sense that sounding like “Carmina Burana” will automatically result in an epic score.

This approach does a huge disservice to a choral score. The human voice is the most emotive of all instruments, as well

as one of the most dynamic in terms of timbre and range. Most importantly, the human voice is the only instrument that can communicate to the listening audience through the poetry of the written word. Setting meaningful text to your music adds an emotional impact unachievable with any other instrument and holds the potential to captivate listeners and pull them deeper within the game world.

### REAL-WORLD ALTERNATIVES

Latin may have been the original choral language at the birth of Western music, but it has been turned away from more and more since the late 15th century. Hundreds of thousands of choral texts exist in the classical romance languages of French, Italian, and Spanish as well as German, English, and more unfamiliar

texts in Chinese, Thai, Russian, and any other language with a cultural folk song tradition. Since choral music has the ability to comment on drama in a way very much akin to the Chorus of traditional Greek theater, the first step when deciding to write choral music should not be which existing piece of classical repertoire to ape, but to think about what the choir can dramatically represent that makes it powerfully unique to your work.

Rather than simply sounding epic in a generic sense, a choir can add to the music by tying the characters together with the plot and setting. Consider where the game takes place. Latin text is considerably less appropriate for a World War II first-person shooter than would be Wagnerian German. Swords and sorcery fantasy games are almost always imbued with an Arthurian sense of early Anglo-Saxon mystique. Rather than using the crutch of clichéd Latin, choral work in Gaelic or the Old English of *Beowulf* lends a noble fluidity to the sound while infusing it with an exotic unfamiliarity.

As a means of rooting the main character into the early-Christian world of *ASSASSIN’S CREED*, Jesper Kyd decided to select from multiple sources for his choral text making use of not only Gregorian chant, but also Muslim prayers. Perhaps the most famous use of non-Latin text in game scoring, both *GOD OF WAR I* and *II* employed bold choral arrangements in Greek in order to cement Kratos in the world of ancient Mediterranean mythology.

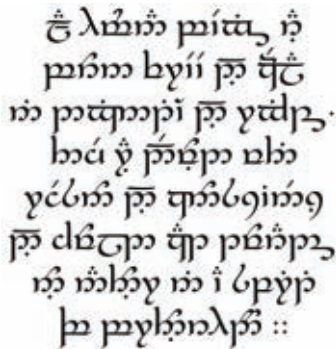
The Internet is a fantastic resource for quickly tracking down thousands of public domain texts in hundreds of languages. **ChoralNet.org** is a site where composers can find a wide array of choral texts in Hungarian, Hebrew, Swedish, Spanish, and Italian to name a few. The oddly-named Robokopp (**www.musicanet.org/robokopp**) is an online resource of thousands of traditional folk songs from German drinking songs to French sea shanties and Welsh hymns.

The Internet is also an excellent resource for finding professional translators in every language imaginable, an invaluable resource for composers when writing their own lyrics or deciding to set text or poetry in a non-native tongue.

### OFF-WORLD ALTERNATIVES

Whether it’s the Pussycat Dolls performing in Simlish, the ancient Mando’a of *STAR WARS: REPUBLIC COMMANDO*, or the vocalizations of K.K. Slider in *ANIMAL CROSSING*, games have a rich history of utilizing vocal music in constructed languages as well. A constructed language is any language that has been artificially built, such as Klingon, Tolkien’s Elven languages, or Esperanto. If your game is set in a completely alien world with completely alien inhabitants, a little extra time and care can result in a captivating new choral language unique to your new world. Diehard fans will devour the content and it will help to sell the realism of a fabricated world. When constructing your own language, if it will be used in music, remember that the most important aspect is its ability to be sung, so practice singing the words out-loud in order to test their ease of pronunciation. Additionally, whatever spelling you may concoct for the official look of the written words, it’s best to write the language into the vocal score in easily-understood phonetic spellings, as anything else will simply waste time on the scoring stage. For more information than you could possibly ever want about creating your own language, you can find noted conlanger Mark Rosenfelder’s language construction kit online at **www.zompist.com/kit.html**.

Even the world of synthesized choirs is expanding beyond Latin. When the next version of EastWest/Quantum Leap’s popular Symphonic Choir library ships later this year, the preconstructed WordBuilder tool will contain new ready-made phrases in English, Italian, Russian, German, and even Elven. ❖



The first article of the Universal Declaration of Human Rights as rendered in J.R.R. Tolkien’s invented Tengwar script.

**JESSE HARLIN** has been composing music for games since 1999. He is currently the staff composer for LucasArts. You can email him at [jharlin@gdmag.com](mailto:jharlin@gdmag.com).

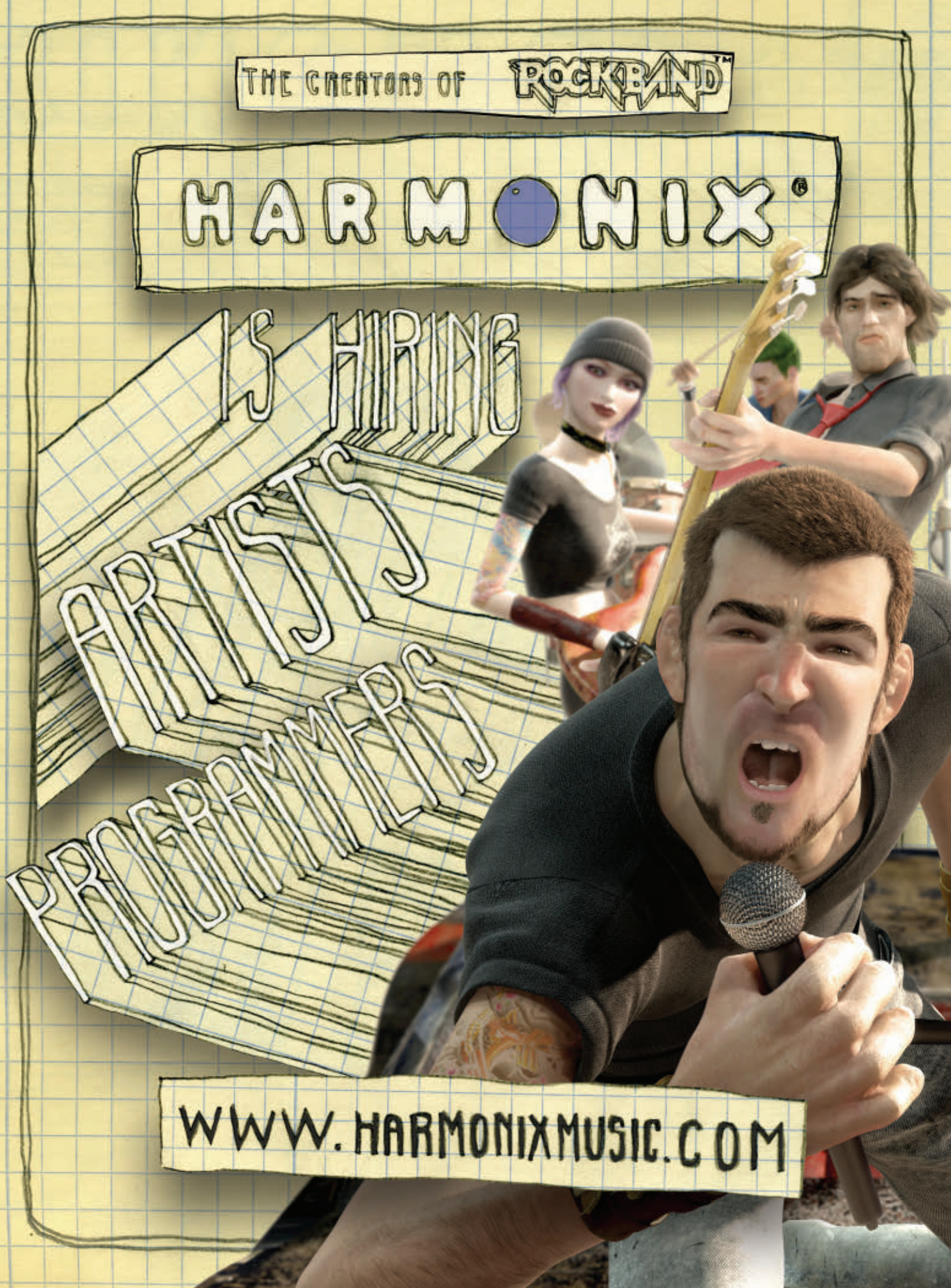


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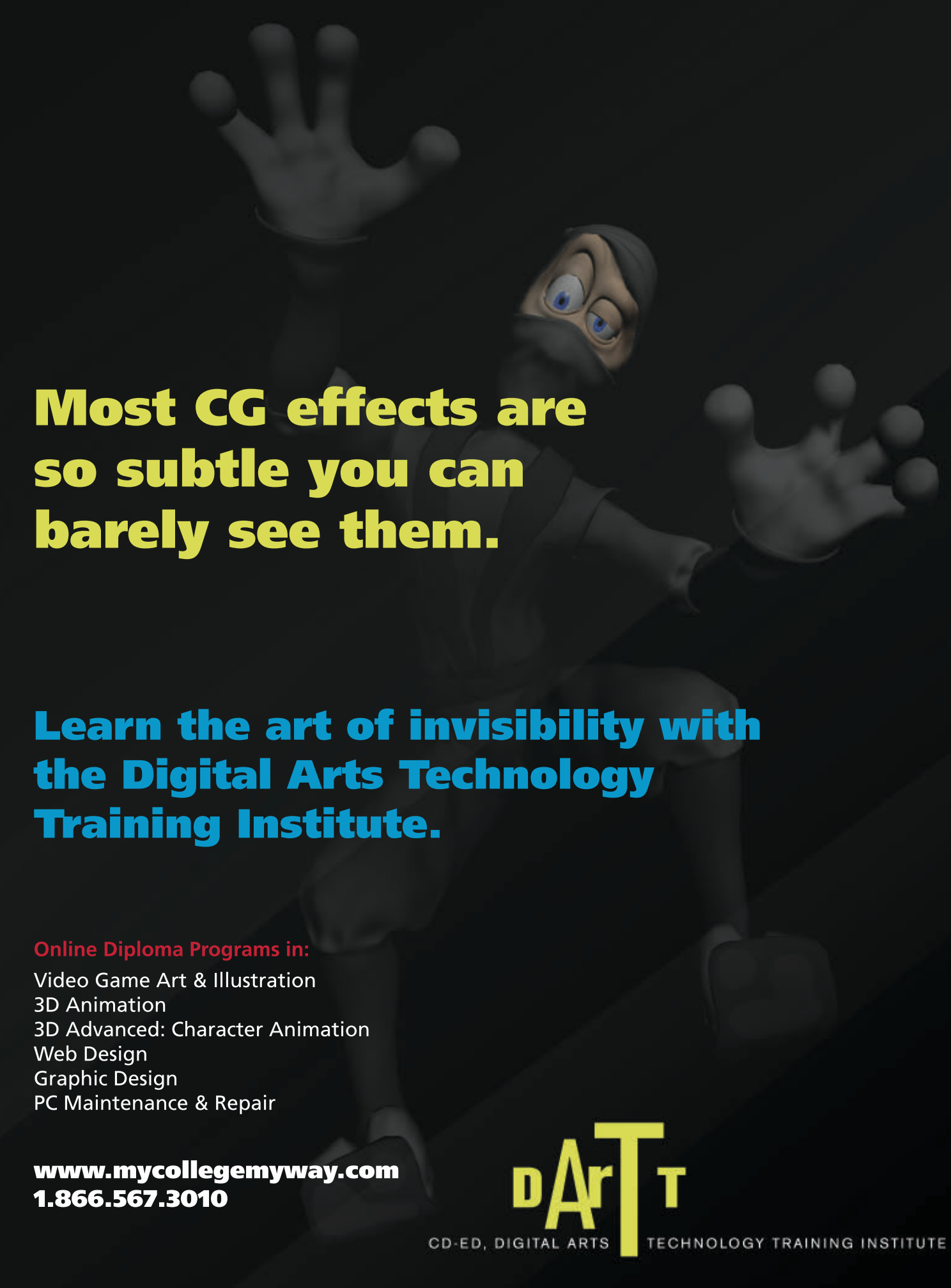
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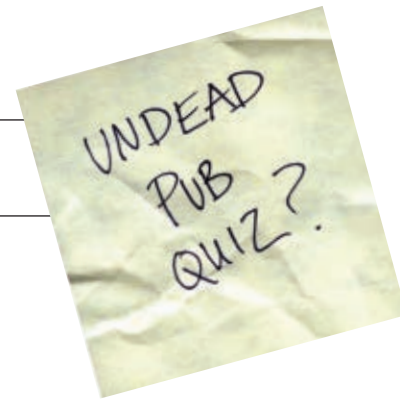
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KARSDEN MÖRDERHÄSCHEN

## ARRESTED DEVELOPMENT

# BEATING THEM AT THEIR OWN GAME



### Another day at Schadenfreude Interactive

**KARSDEN MÖRDERHÄSCHEN** is CEO of very important South German game development studio Schadenfreude Interactive. Email him at [kmorderhaschen@gmag.com](mailto:kmorderhaschen@gmag.com).

**JUST A FEW DAYS AGO, I FOUND A** strange man talking loudly to himself in our conference room. That he was talking to himself was not the strange part. Our lead programmer, Otto, talks to himself all the time (then again, he also claims to think in reverse Polish notation).

On further investigation, the man in the conference room revealed that he was here to see me. He apologized for “Bluetoothing,” saying he “just needed to free up some bandwidth in order to maximize our present synergy.” He then introduced himself as Chad. Just Chad. Was he here to sell us something? Toner cartridges? Vacuum cleaners? Digital rights management software?

No, he wanted to talk about **WORLD OF WARCRAFT**.

Chad was a venture capitalist from California. Chad had heard a lot of things. He had heard that **WoW** had over ten million subscribers worldwide. He had heard that video games made more money than Hollywood movies. He had heard it was cheaper to outsource game development to Eastern Europe, which is what brought him to us. Note: we are located in southern Germany. “East” is, I suppose, a relative term. Apparently he had not heard many native German speakers, though, as he was disappointed that my accent did not sound like Hans Gruber’s in *Die Hard*.

I found myself slightly offended—but then he offered me three million dollars.

#### HERE BE DRAGONS

I told Chad we would consider his offer, although privately I had some concerns. At Schadenfreude Interactive we prefer to make single-player games, as we have trouble handling groups of more than ten people. My co-workers can barely manage a CC list without spamming a 250-Euro Neiman Marcus pfeffernüsse recipe to everyone and their grandmother.

And I must admit, I have not actually played **WORLD OF WARCRAFT**. Our art director, Lothar, is a fan, and he

is forever trying to tell me some fascinating thing about murlocs, which I tune out as I do when he tries to tell me some fascinating thing Joss Whedon said about existentialism.

Although Schadenfreude has made two licensed *Lord of The Rings* auto-racing games (**NAZGUL THUNDER** and **NEED FOR SPEED: UNDERHILL**), I do not myself care for swords-and-sorcery. The last time I played *Dungeons & Dragons* was in 1984—I got up to go to the bathroom and while I was gone, a kobold wielding only an oyster fork murdered me in cold blood and stole my Hand of Vecna. These kinds of things just do not happen while playing **SETTLERS OF CATAN**.

Then again, three million dollars is a huge sum, even in American money.

But how could we come up with a game so amazing that it would steal **WORLD OF WARCRAFT**’s thunder?

#### WELCOME TO THE THUNDERDOME

I ushered my employees into our tiny lounge, home to a refrigerator, card table, and our prized ancient **GRABUNGADUNG** arcade cabinet.

“Schadenfreudians,” I declared, “We are going to stay in here until we come up with a game that will beat **WORLD OF WARCRAFT**.” Gathered around the card table, pens and notepads at the ready, we commenced brainstorming.

“Has anyone read *The Eye of Argon*?”  
“What if every player is a gelatinous cube?”

“It’s like **LOOM** meets **OMAR SHARIF BRIDGE** ...”

“Yes, but could a mermaid drive a manual transmission?”

As the hours crept by, the room grew uncomfortably warm. Otto even took off his omnipresent sweater vest. Crumpled balls of paper piled up at our feet.

This nut was harder to crack than we had thought.

“... wouldn’t that make it a **MMORPG**?”

“Needs more giant space hamsters.”

“You go into this dungeon and there’s

another, smaller dungeon ...”

“... the dark elves steal everyone’s pants.”

It was becoming clear that we would crack long before the nut did. Someone suddenly recalled that there was beer in the refrigerator, left over from our intern’s ten-year anniversary party.

Many beers later we were all very enthusiastically designing a massively multiplayer drinking game called *World Of Warcraft*—a cross between **BARD’S TALE**, **DINER DASH**, and that movie where Tom Cruise makes fruity cocktails.

Otto and Lothar even choreographed the races’ dance animations for us: their “Wight Wench Watusi” and “Beholder Busboy” moves were particularly impressive. It is shocking how much Otto loosens up once he gets out of that sweater vest. I can only hope that none of this shows up on YouTube.

#### BYE, BYE, MR. AMERICAN PIE

I awoke the next morning underneath the card table with my aching head resting on a stack of *Game Developer* magazines and a Post-It that said “**UNDEAD PUB QUIZ**?” stuck to my ear. The dark elves had stolen my pants.

We had not come up with a game that would beat **WORLD OF WARCRAFT**, but I did come to an important realization. I founded this company to make the games I wanted to play, not to copy other people’s games, and certainly not just to make money. So many people are trying to get a piece of the massively multiplayer pie! Chad did not want us to make him a good game—he wanted us to make him a pie. And while that pie may look tasty, it’s served a la mode with a scoopful of meretriciousness and heaped with the non-dairy whipped topping of avarice.

No thank you.

I called Chad and turned down his development offer. I am sure he is headed to another game company in Romania, Belarus, or perhaps even Boston—“east” is, after all, a relative term. ❖



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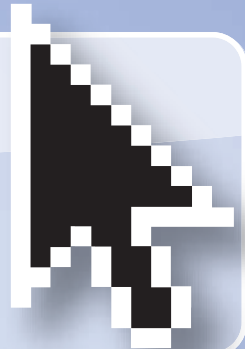




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