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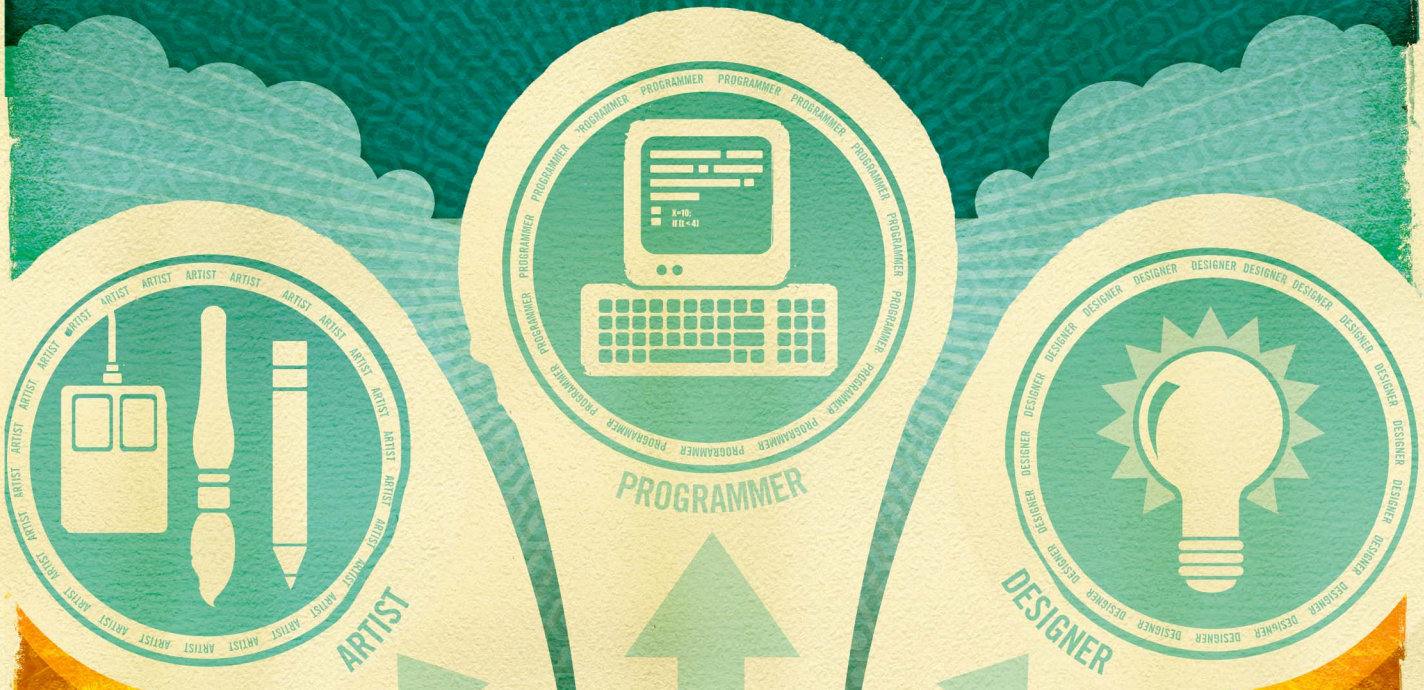
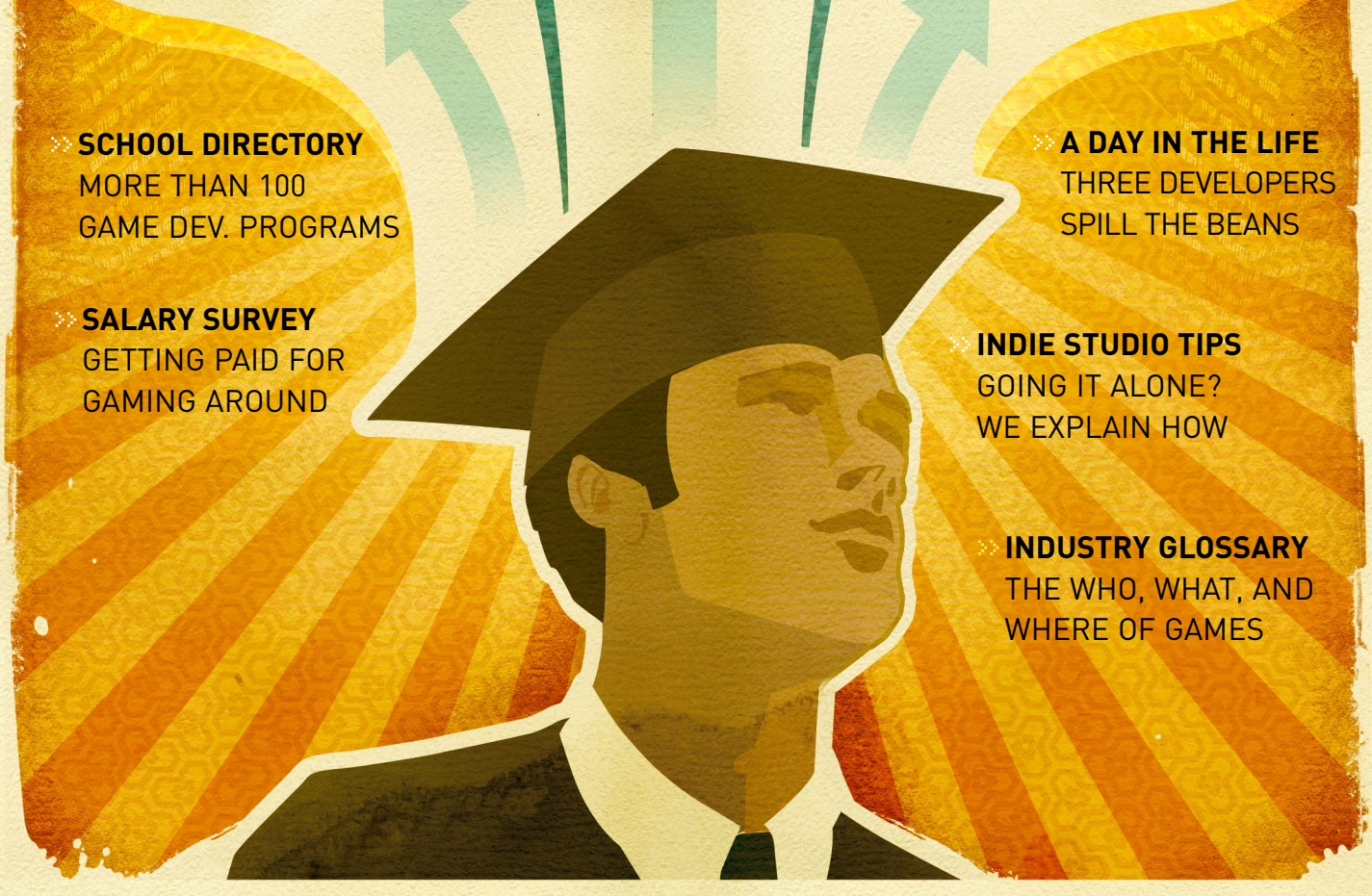
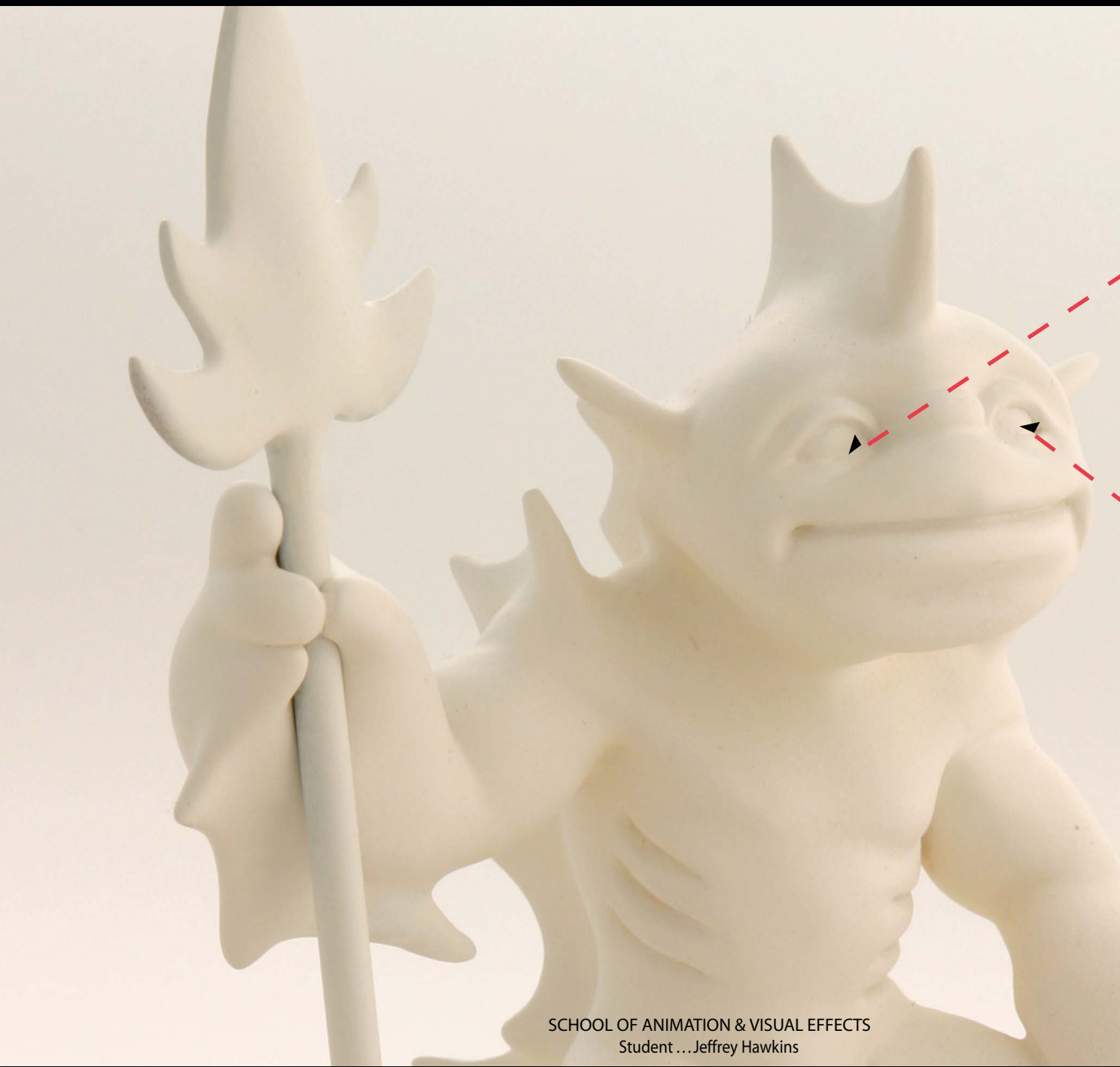
FALL 2005

GAME CAREER GUIDE





- **SCHOOL DIRECTORY**
  MORE THAN 100 GAME DEV. PROGRAMS
- **SALARY SURVEY**
  GETTING PAID FOR GAMING AROUND
- **A DAY IN THE LIFE**
  THREE DEVELOPERS SPILL THE BEANS
- **INDIE STUDIO TIPS**
  GOING IT ALONE? WE EXPLAIN HOW
- **INDUSTRY GLOSSARY**
  THE WHO, WHAT, AND WHERE OF GAMES



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Student . . . Jeffrey Hawkins

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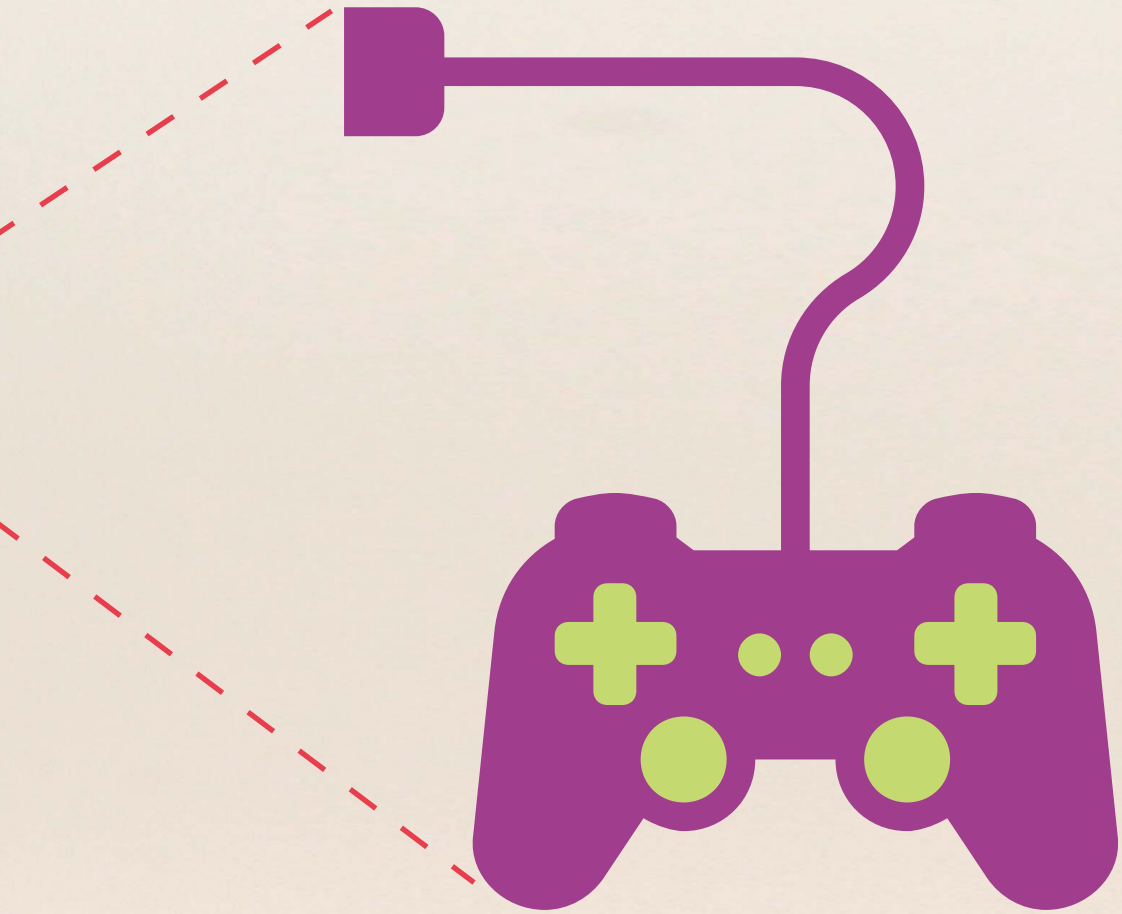

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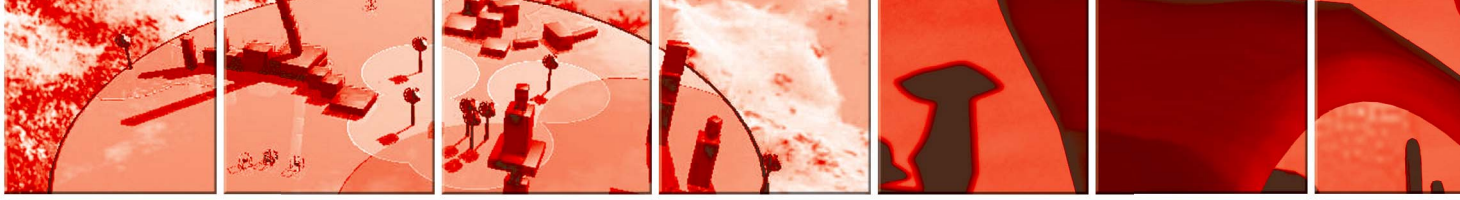
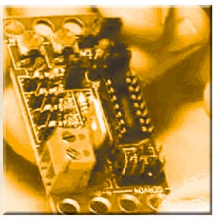
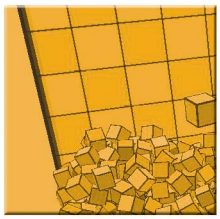
Associate of Applied Arts in 3D Computer Animation
Bachelor of Science in Real-Time Interactive Simulation
Master of Science in Computer Science
Bachelor of Science in Computer Engineering

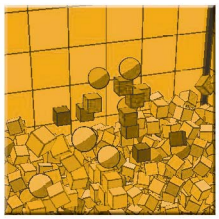


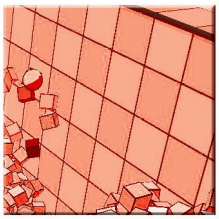
The Content

At the core of each degree program are academic courses that are combined with extensive production experience, all of which has been developed with significant input from the industry.







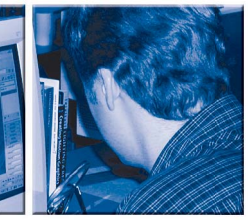


The Faculty

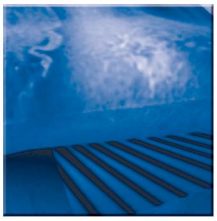
The instructors are a diverse group of capable academics and accomplished industry professionals. Many have successfully worked in the industry and now passionately share their knowledge and experience in the classroom

The Industry

Situated in one of the major game development communities in the world, DigiPen has developed strong relationships with many industry-leading companies who continue to recruit both interns and employees from the student body.



The Students



The diverse student body is a motivated group of individuals who have helped create an atmosphere where passion for the work, dedication, and excellence are shared and truly respected.

gamedeveloper presents FALL 2005

GAME CAREER GUIDE

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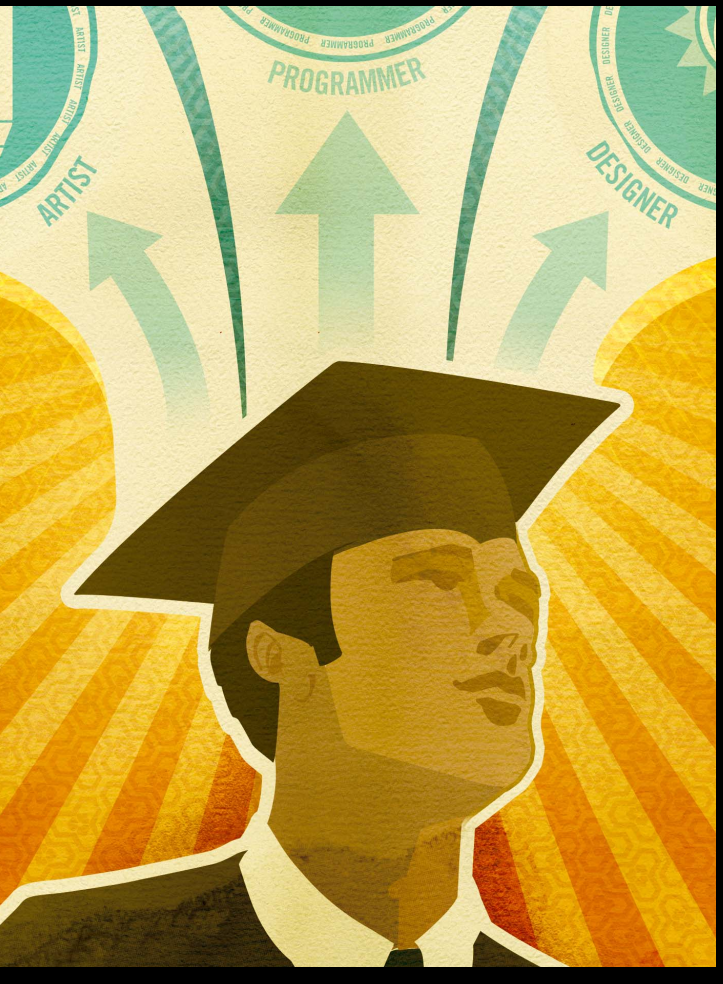

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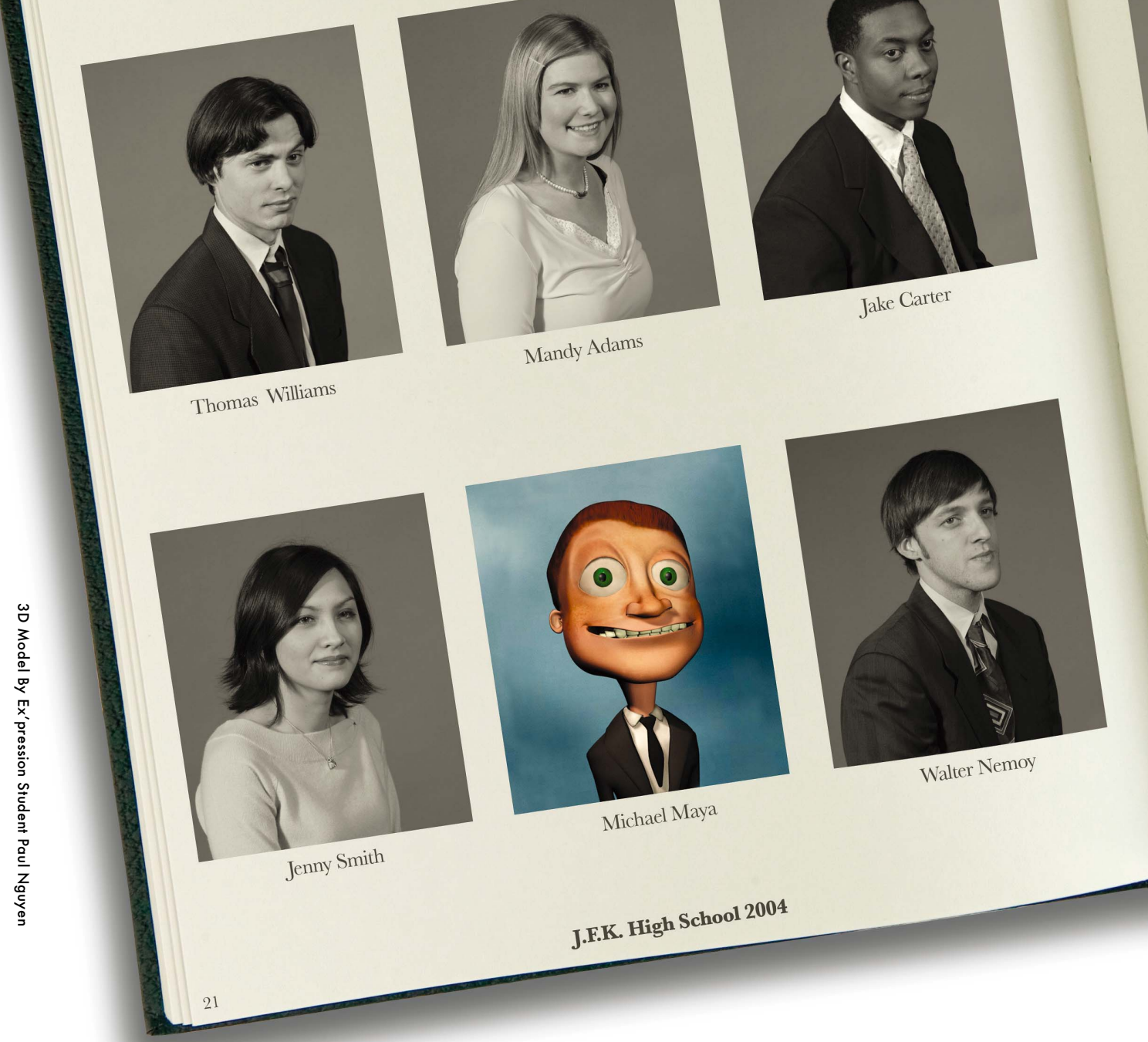
DEPARTMENTS

COVER ART: ORIGINAL ART BY SCOTT HANSEN



3D Model By Ex'pression Student Paul Nguyen

SEND COMMENTS TO THE EDITORS AT EDITORS@GDMAG.COM

THE GOLDEN PATH

WITH THIS BEING THE FOURTH ANNUAL ISSUE OF *Game Developer* magazine's special *Game Career Guide*, our august journal for those seeking a career in game development is now significantly into its kindergarten years.

With the resources and contacts we've developed through running a monthly magazine for game creators, we've managed to assemble pages and pages of useful information for aspiring developers, hopefully answering many of the burning questions you might have about creating games. But if there's a question you still have that we did not address, send us an email: editors@gdmag.com.

TODAY IS THE GREATEST

First, our lead feature, "A Day In The Life" (pg. 10), sketches the routine of three game professionals in the art, programming, and design disciplines hard at work. These three developers walk us through what a typical day in their existence actually consists of, whether it's modeling environments for SCARFACE or surfing waves during lunch hour.

Also vitally explored in this issue is how you can actually make the break from college into a position as a game developer. Getting that first position in the industry is the biggest hurdle, since experienced developers of all shapes and sizes (and console developers in particular) continue to be in demand in the expanding industry.

Luckily, Matt Gilgenbach and Daniel Sass, two professional game developers who were keen to communicate their experiences, have relayed some of the challenges they faced as fledgling programmers trying to enter the industry. As they suggest in the introduction to their piece, "If you want to make yourself stand out in the sea of inexperienced college graduates, you need a good demo, experience, a good resume, and a good idea of what to expect." Hopefully their article (pg. 38) will help you learn those four key tips.

BOOKS, INFORMATION, OH MY

Elsewhere, we've asked former Gamasutra.com editor Brad Kane to count down his 10 favorite game-related books (pg. 80) that are particularly suited for anyone just starting their way into the game industry. In addition, we've filled our conventional Heads Up Display news section (pg. 8) with fact sheets on some of the most important game-related organizations and conventions you'll need to know about, and we've included our entire salary survey (pg. 29, which first appeared in our April issue) to help you understand how much industry novices and veterans actually earn.

And last but not least, we've updated our annual, comprehensive directory-based guide (pg. 48) to North American schools offering game development programs, providing you with contact details, tuition prices, and degree information, and sundry other delicious details. We've also expanded this year's list of international schools.

THE BIGGER PICTURE

If you enjoy this one-off *Career Guide* and are craving more complex, in-depth articles about the trials and tribulations of making great games, you should probably try our main publication, *Game Developer*. This year, we've also launched a special digital edition of the magazine (www.gdmag.com/digital), an inexpensive way to get your yearly subscription and access back issues. You can also still get conventional paper-based subscriptions of the publication by subscribing online at www.gdmag.com.

In tandem with *Game Developer* magazine, our sister web site Gamasutra.com provides quality, daily industry news and also hosts both exclusive features on game development and the most active job board for game professionals in North America. Gamasutra has an education section, too, that's regularly updated with game theses, student galleries, and user-submitted school information.

We hope you'll find all this information valuable. We love our job of supporting both established and budding professionals in the game industry with the latest information and creative content—and we hope that outlining the choices you have in game education will lead to your long and happy career in games, too. And although not everyone can be a legendary auteur like Shigeru Miyamoto, many can and do become integral parts of tight-knit teams that make great, fun video games. Who knows? Reading this magazine may be the start of your move toward banjo-strumming, chain-smoking greatness, like Miyamoto's. Just remember, whatever you do, to have fun learning and practicing your profession.

S!

Simon Carless, editor

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- 3+ years programming experience (game industry preferred)

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The first title from developer ArenaNet, Guild Wars threatens the entire online RPG establishment with its bold design.
Gamespot.com review.

ARENANET

FACT SHEET

WHO TO KNOW AND WHAT TO DO IN THE GAME INDUSTRY

EVENTS

Some of the biggest occurrences in the video game industry are its major events—here's a primer.

E3 EXPO

www.e3expo.com

The Electronic Entertainment Expo (E3), an annual event since 1994, is *the* publisher/retailer event. More than 400 companies come to exhibit their wares on a raucous show floor that spans 720,000 square feet of the Los Angeles Convention Center. Every year, tens of thousands of game professionals make a trip to southern California in May to unveil their holiday lineups, party with colleagues, and savor the heady atmosphere. The entire, week-long affair is owned by the Entertainment Software Association and, unlike some other trade shows, is closed to the general public.

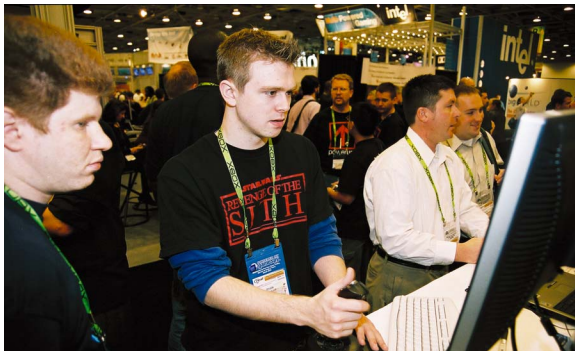


PHOTO BY ROBIN DIAL

▲ GAME DEVELOPERS CONFERENCE

www.gdconf.com

If attending E3 is a pilgrimage, then going to the Game Developers Conference (GDC) is like taking a meditative journey—it's a quest for new knowledge, new professional contacts, and new technical advice. The spotlight of GDC is on developers and what they do best: make games. So, naturally, the conference sessions, keynote speeches, and other events, including the Game Developers Choice Awards and Independent Games Festival, are all tightly focused around the various disciplines within game development, such as art, audio, design, and programming. GDC takes place in March in the San Francisco Bay area and is owned and operated by CMP Media, which also owns *Game Developer* and Gamasutra.com.

AUSTIN GAME CONFERENCE AND WOMEN'S GAME CONFERENCE

www.gameconference.com
www.womensgameconference.com

What makes the Austin Game Conference unique is its local flair. Like GDC, the Austin show comprises a series of professional, intellectual, career-related talks for game developers, students, and people trying to get a foot in the door. But the Austin Game Conference is distinctly regional, with fewer developers traveling from afar to attend, though you're likely to meet a good number of folks from L.A.

In 2004, the organizers of the Austin show, the Game Initiative, created a simultaneous, yet smaller, show on the side: the Women's Game Conference. The event recognized the dearth of women developers in the industry—which grew from about 7 percent in 2003 to a mere 8 percent in 2004 (see the Salary Survey, page 29).

SERIOUS GAMES SUMMIT

www.seriousgamessummit.com

The Serious Games Summit, also owned and run by CMP Media, launched in October 2004 as the first massive collaboration of video game makers for non-entertainment purposes. Officials who largely hail from military, health care, and educational institutions gather in Washington D.C. to discuss how video games have been changing their fields. The conference is slated for October 31–November 1 this year just outside Washington, D.C. in Arlington, VA.

PHOTO BY JAMIL MOLEDINA

TOKYO GAME SHOW ▲

http://tgs.cesa.or.jp/english

Japan's Tokyo Game Show, organized by the Computer Entertainment Supplier's Association and Nikkei Business Publications, splits its loyalties between the general public and industry professionals. This year's TGS, held at the Nippon Convention Center in Chiba City, starts off with an industry-only event on September 16 and continues on September 17 and 18 with both professionals and the public invited. Last year's TGS spotlight was the unveiling of Sony's PSP in playable form.

D.I.C.E. SUMMIT

www.dicesummit.org

Created by the Academy of Interactive Arts & Sciences as an exploration of the creative process in game development, the D.I.C.E. Summit began as an industry workshop event in 2003, and includes both high-level business talks and a yearly game development award ceremony. The event is held in Las Vegas every February.

AUSTRALIAN GAME DEVELOPERS CONFERENCE

www.agdc.com.au

Now approaching its seventh year, the Australian Game Developers Conference invites game developers down under to learn and interact with their peers, though

the conference has seen more international attendees in the last two years or so as the region takes on greater significance in game development. This year's conference is scheduled for December 1–3 at Federation Square, Melbourne. Featured international speakers will discuss development aspects, such as art and audio, as well as future industry trends and platforms.

CES
www.cesweb.org
As North America's largest trade-only technology expo, the Consumer Electronics Show (CES) unveils the latest trends in all things electronic for the coming year, and the game industry has been building its presence at the show over the last few years. Hardware creators in particular bring their top products to this massive exhibition, hoping they'll stand out amid the other "emerging technology" gadgets. Held in Las Vegas—the next show will be January 5–8, 2006—CES allows game makers an opportunity to push their wares toward a broader technology-based crowd.

CHINAJOY ▶
www.chinajoy.net
The third annual China Digital Entertainment Expo and Conference, or Chinajoy, aims to be the Chinese equivalent of E3 or TGS. Organized by the Chinese government and several private organizations, Chinajoy both promotes the national game industry and encourages international game-makers to move into the Chinese market. Conference topics are focused on the fast-developing Chinese game market and the technology behind China's software development. The Shanghai New International Exhibition Center hosted the event from July 21–23 this year.

PHOTO BY MICHELE MAGUIRE

ORGANIZATIONS

These associations help the industry advocate, regulate, and advance. Here are the big names you should know.

IGDA
www.igda.org
The International Game Developers Association (IGDA), a non-profit membership organization, is a community of professionals dedicated to the art, science, and business of producing video games. From pursuing working condition standards for employees in the game industry to fighting government censorship, the IGDA works in the interest of industry professionals and is known to organize meetings to bring game professionals together, such as the recent Quality of Life Summit at the 2005 Game Developers Conference.

ESA
www.theesa.com
A representative for the game industry, the Entertainment Software Association (ESA), formerly the Interactive Digital Software Association, presents a common front on video games to the general public. The ESA, a membership organization, focuses on the business side of game development, pursuing issues like game piracy, violence in games, and industry profitability. The E3 tradeshow is also owned and operated by the ESA.

ESRB
www.esrb.org
The Entertainment Software Rating Board (ESRB) was established in 1994 by the ESA as an independent source for the application and enforcement of game ratings. Formed as a response to public awareness of violence in games, the organization rates games on a scale based on age-appropriate content and works to shield game producers from the fallout of lawsuits stemming from ratings. Parents can visit the ESRB web site to review the ratings of specific titles. Additionally, the ESRB's Privacy Online service safeguards personal information collected online, and is sanctioned as a "Safe Harbor" under the Children's Online Privacy Protection Act.

ELSPA
www.elspa.com
The Entertainment & Leisure Software Publishers Association (ELSPA) operates as the united front for the U.K.'s game industry. Formed in 1989, ELSPA addresses industry issues such as anti-piracy enforcement and content ratings. ELSPA operates the annual International Game Summit and sponsors the Edinburgh Interactive Entertainment Festival.

TIGA
www.tiga.org
The Independent Game Developers Association (TIGA), launched in 2001, works to stabilize and advance the U.K.'s and Europe's place in the global game industry. The organization has a notable business and political edge, reporting in statement of facts that the European games industry requires "strong partnerships" with government and that the industry needs to work together to share knowledge and create "best practices."

AIAS
www.aias.org
The Academy of Interactive Arts & Sciences, a non-profit member organization, serves the game industry through promotion and advancement of the industry. AIAS runs the D.I.C.E. Summit and acknowledges developer excellence with the Interactive Achievement Awards, presented at D.I.C.E. every year.

—Jill Duffy and Alan Bank

ADDITIONAL RESOURCES

There are several additional events and organizations that game industry professionals should become familiar with, including:

EVENTS

Advertising in Games
Casual Games Conference
Christian Game Developers Conference
Game Developers Conference Europe
Microsoft Meltdown
Mobile Games Conference
Montreal Game Summit
Siggraph
Taipei Game Show

ORGANIZATIONS

Computer Game Artists Association
Game Developers Association of Australia
International Game Journalists Association

» john miller, noel llopis, and david sirlin

A DAY IN THE LIFE

THE SECRET LIVES OF A VIDEO GAME ARTIST, PROGRAMMER, AND DESIGNER

ARTIST

AFTER WORKING FOR SEVERAL YEARS IN THE INDUSTRY AT various game companies, I was happy to discover the unique environment at Radical Entertainment.

Currently, as an environmental artist, I create game environments for the new title Scarface. This game has an ambitious amount of art content, spanning from downtown Miami to the lush tropical islands off the Florida coastline. Artwork includes natural terrain, foliage, buildings, and props. I create these from initial concept to a fully textured object for the game.

6:00 AM I am awoken by my wife's clock radio (she teaches high school English). The alarm sounds like a car wreck or some kind of natural disaster. I go back to sleep for a bit.

8:30 AM I'm woken up by wife's cat scratching at the door. The cat will not stop scratching until I get up. I get ready for work while being attacked by the cat and leave to catch the SkyTrain; public transit in Vancouver is the only way to go. I take SkyTrain from Burnaby into the city.

8:45 AM I arrive at the Science World SkyTrain. On the way to work, I grab a coffee.

9:00 AM At my desk, the Scarface game is on the TV monitor. Files are still loaded from yesterday.

In the game, I move the camera, exploring the enemy camp I've been working on. My goal is to fill in an empty area near the shore. Last week I worked primarily on props for the camp, placing them in their own folder. The week prior, I went to an industrial yard and took some photos to get source images for the props. These give a great idea of how old debris and aged textures look close up. With the props now fully textured and lit, I can pull them into the game level and block out the camp. I start by placing shacks, guard towers, and gun turrets to get a feel for the space. While working, I adjust some of the layered materials on the terrain to have more uniform mapping. When the camp is blocked out, I'll check with the level designer to make sure the layout fits with the mission.

10:30 AM The art director, Michel, comes by for a meeting about the new enemy camp areas and surrounding island. First, we review the new batch of props for the enemy camp. Michel requests different art alterations to reduce the army colors and camouflage in favor of a more makeshift appearance for the props and buildings.

10:35 AM While I'm busy adding new pieces of debris to the enemy camp, a small group meeting is taking place behind me. The topic is how to optimize and adjust our approach to adding static and state props to the game. We're trying to create a more streamlined approach for all of the environmental artists to create and manage game assets.

11:00 AM When we run into problems with the game, we enter a description of the problem into a "bug database." I just received one that confirmed a fix. Earlier this week, my instanced foliage (trees, bushes, and flat facing trees) was getting textures auto resized to 64 pixels. They now export at the full texture size. This will make doing the art pass easier because the appearance of foliage and instances will look cleaner.

11:15 AM While loading the camp, I notice one of the canopy trees is giving an art error. I ask Mike, a technical artist, to help fix the error. He changes a setting in the script. I re-export the trees, and the trees appear again in the game. I continue placing and orienting trees in the environment.

12:00 AM Lunch. Another one of Radical's legendary lunches has arrived. Today, shepherd's pie is on the menu and there are vegetarian samosas, too.

JOHN MILLER *is an environmental artist at Radical Entertainment. He previously worked at Activision and International Forest Products.*

NOEL LLOPIS *is the lead technical architect at High Moon Studios where he spearheads the research and development of internal technology for next-generation platforms.*

DAVID SIRLIN *is a game designer and producer at Backbone Entertainment. He's also a multiple-time national tournament champion in Street Fighter Alpha 2.*

ART CREDIT: SCOTT HANSEN

1:00 PM I just went through scheduling with Ivan (production/scheduler). We reviewed a new list of props made for the different island game art and enemy camps. I then make an appointment with Bryan, a designer, to discuss the upcoming layout of buildings and props in the enemy camps.

1:30 PM I work on an old enemy camp headquarters building to include some adjustments given to me earlier by the art director. His changes are to remove some of the green army-style camouflage in favor of more hanging tarps for a more makeshift appearance.

I start by removing some of the camouflage geo. Using Photoshop, I create a new tarp texture with some good wrinkles and perforations clearly visible. I offset the texture and blend the edges using clone brushes to make sure it tiles correctly. After adjusting and testing in the game space, I tweak some of the geo to make the tarps have more rounded edges, and tweak the vertex lighting a bit to make sure the new texture blends well with the roof and wall textures. Exporting the level section, I check the file sizes to make sure that the file is still in its memory budget.

John Miller is an artist at Radical Entertainment.

3:30 PM A meeting takes place regarding team structure and how the schedule for next year looks. Planning for additional projects is already underway!

4:00 PM Looking at the environment for the enemy camp, I start to add worn vehicle tracks into the sand. Last week, I created a worn gravel texture, but now I need to match the color range to the rest of the terrain. I open the indexed file, convert it back to RGB, and add a layer. With the other terrain texture open, I sample the color range and apply it to the new layer for the tire tracks.

The file is re-indexed, saved, and exported in the Maya file. After exporting it into the game, the roadways are not quite mapped correctly, so I adjust and re-export with the fixed orientation on the faces. Using the layered shader, I'm able to blend the edges of the vehicle tracks into the terrain.

4:30 PM For paths, I've added a bit of geo into the terrain to make a slight recess for the character to walk in. I create a new layered texture with a varied terrain, sharper rocks and markings. After applying the new texture to the path, I darken the inside areas slightly. Where the path approaches the first shack, I vary the path texture under the stairs to make sure they stand apart visually.

5:00 PM Today the technical artists have requested we check our work into the Perforce file system. They plan on combining the script files that have our instance locations and details. By combining them from multiple files into a single file, they hope to improve the workflow.

After checking in the files, I continue working on the environment. I'll be able to resume placing more instances in about an hour when the technical artists complete the changes. Until then, I continue to work on propagating the camp.

6:00 PM With the new instance scripts updated, I can continue placing trees in the environment. I notice one of the canopy trees has a dull pre-lighting scheme. To adjust the tree's lighting, I first manually adjust the top vertices and increase their RGB value. The bottom vertices have their value decreased in brightness. With the whole tree selected, I use the P3D lighting tool to increase the contrast by 20 percent. After exporting the new tree into the game, it looks about right and fits better with the overall appearance.

6:20 PM To finish for the day, I have some design-related changes I was assigned to make at a meeting last week. One of these affects the guard towers for the camps. Recently, I changed the art so it would appear less sturdy and more makeshift, using steel braces and blue tarps. The top of the structure needs to be four meters tall for the best camera clearance.

Loading the file, I adjust the rooftop and increase the distance from the floor bottom. By testing the camera and placing the character in the tower I can tell the camera clearance is less obstructed.

6:40 PM All files are saved and checked into the server. It's a warm summer night and the sun is still out (and it's not raining). It's time for me to walk down to the SkyTrain and make my way home.

—John Miller

PROGRAMMER

HIGH MOON STUDIOS IS AN UNUSUAL COMPANY IN THE GAMES industry, applying agile methodologies for all development. My team in particular is using both Scrum (an agile management methodology) and Extreme Programming (an agile engineering methodology). And yes, that means we're doing pair programming, test-driven development, and all the other often controversial practices. I expect that in a few years, these practices will be a lot more common than they are today.

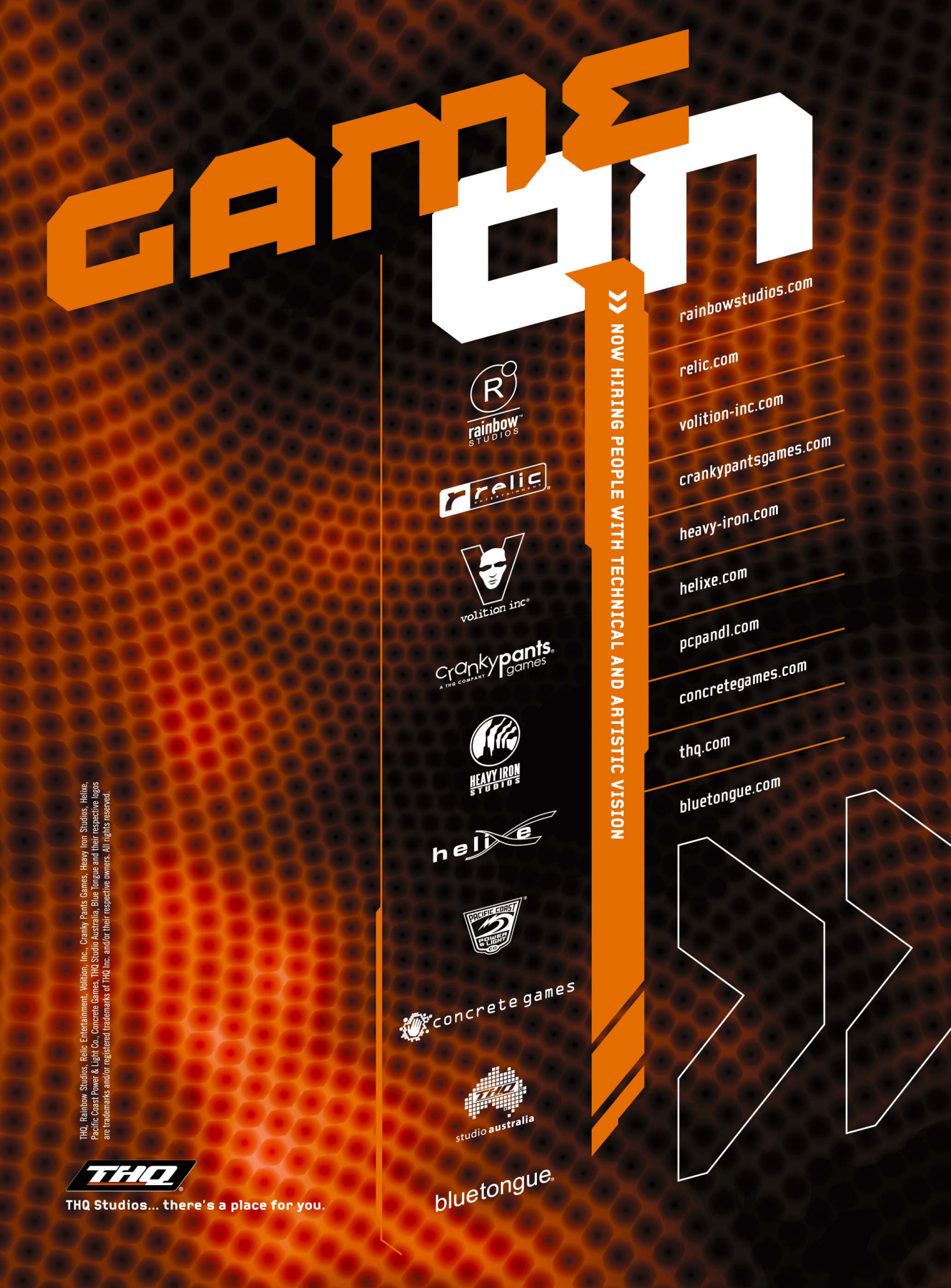
I lead the R&D team here, and our primary responsibility is to come up with the technology that game teams use for different projects. Nowadays, that means putting a lot of middleware programs through their paces and choosing the ones that best suit our needs. But it also means getting down and dirty and writing a lot of code for our engine and tools.

With that in mind, come on and follow me through a typical workday.

8:10 AM I roll in to work on my bicycle, like I do every day. Even though I'm an early bird, Jim, a programmer in my team, arrived a few minutes earlier and is already at his desk.

I quickly catch up with my email. I also notice that the PCLint pass on our codebase last night caught a couple of minor warnings, so I quickly fix those and check them in.

8:20 AM Today is Tuesday and our two-week iteration ends on Friday. An iteration consists of a fixed period (usually two weeks, in our case) during which time the team commits to delivering a set of functionality described through customer stories. The customer (in our case, the other internal teams in our company) creates and prioritizes a set of stories. My team then breaks down those stories into tasks and estimates how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Noel Llopis and other engineers at High Moon Studios work in a pair-programming environment.

long they will each take to complete. Tasks generally vary between one and eight hours.

Jim and I walk over to the "war room"—the room with all the task cards corresponding to user stories pinned to the wall—and we choose the task that reads, "Blend ragdoll and animation," which is part of the user story listed as "Throwing a rigid body at a character and seeing a hit reaction." The task was originally estimated to take three hours, but now that we know that the ragdoll system is a bit more complicated than we thought, we re-estimate it to take four hours.

8:23 AM In addition to our own personal desk areas, we have pair-programming stations in the R&D lab, with two monitors, two keyboards, two mice, two chairs, and plenty of room for two people. All production code is written by pairs of programmers. We grab a station and start working on the task.

Since we're using test-driven development, we first write a very simple unit test for what we want to do, and only then write the code to make it pass.

Our first test checks that we have created a blender object without inputs and that it produces no output. Then we write the blender class and make the test pass. It's a tiny step, but it's a step in the right direction. The whole cycle of write test, write code to make test pass, and refactor takes less than 10 minutes, and we do it over and over.

8:39 AM We have implemented a small amount of functionality and all the code builds, and all tests pass, so we check it in source control. This is called continuous integration, and it requires that programmers work on the latest version in source control and check in their own changes many times throughout the day.

8:50 AM Other people from the team roll in, grab other pair programming stations, and start going at it. On their way in, we have a quick chat and find out what we're all working on.

9:37 AM I overhear Joel and Gary discussing how they're going to test something that requires updating the physics simulations. I just did that a couple of days ago, so I jump into the discussion. It turns out they need to do something that's almost the same as what I already did, so I point them to what I wrote and they will modify it to suit their needs.

10:05 AM Things are moving along very nicely. We've checked in four times already this morning. When a pair gets really going, they might check in as many as 20 times or more in a single day. At this rate, we might be done sooner than the four hours we had estimated.

10:14 AM We have the daily Scrum meeting at 10:15, so we head over to the war room. Scrum meetings are very short, standup meetings with the whole team (eight people plus Brian, our producer). We quickly go around the room to discuss what people are doing and get everybody up to speed.

10:23 AM During the meeting, the topic of how we're loading physics assets comes up. So we return to the pair programming area and have a quick discussion with everyone involved. We draw some quick UML charts on a whiteboard, think about how the data is going to be passed around, and after 10 minutes, reach an agreement and go back to work on our tasks.

11:15 AM We get the blending working correctly. All the unit tests pass, although we haven't implemented it in the demo yet. There's another task card for that. We check the code in right away. The code definitely can stand to improve in a few places because we had only concentrated on getting things working. So we spend some time refactoring. We have lots of unit tests, so we're confident our refactoring isn't introducing any bugs.

11:56 AM The code is now in a much better state. We check it in and wait a few minutes for the build server to report that everything built correctly and that all tests passed. During that time, we talk about what the next task should be.

12:05 PM The beach is quite close to the office, and the surf is shoulder-high today, so I go surfing at lunch with several of my teammates. On lunch breaks, if we're not surfing, we're playing a basketball game, cycling, running, or even practicing yoga. If all else fails, there's always a game of Guild Wars with the rest of the High Moon clan.

1:25 PM Back at work, Sean stops by my desk. He's ready to go back to work, but the programmer he was pairing with in the morning got pulled to work on some last-minute issues with

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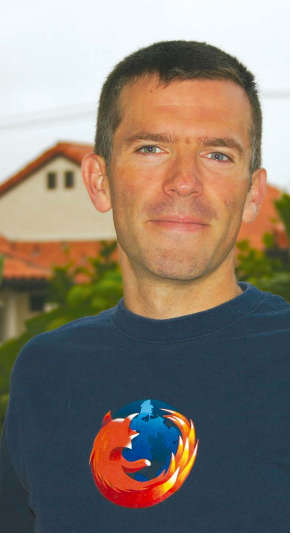

Noel Llopis is the lead technical architect at High Moon Studios.

DARKWATCH, which is about to go gold and has priority over anything we're doing. When a game goes gold, it means that the game is being made into a final, master CD (a gold CD), which is sent out to be duplicated, packaged, and sold.

Sean quickly brings me up to speed on what he and his programming partner had been working on that morning: to display the exact memory usage for our physics system. I remember them mentioning earlier in the Scrum meeting that they were working on this task. I also worked on the physics system last week, so I'm pretty familiar with the code.

In a couple of minutes, we're already making progress.

2:07 PM After writing several unit tests and implementing some functionality, we're ready to add the memory display to the demo program. A couple of minutes later, we have a display in the demo indicating how much memory the physics system is using, and we see it go up and down as we add and remove rigid bodies from the demo.

But something is wrong. When we remove rigid bodies, the memory doesn't come down to the same level as before. We exit the demo and see a long memory leak dump. First things first, we check in our changes, and then we dive in and look for the code that is leaking memory. It's probably not caused by the code we just wrote, but we have "collective code ownership," which means that everybody is expected to fix anything that needs fixing, no matter when or where or why it occurred.

2:12 PM The build just broke! The build server detected a failed build and notified us through a system tray application. I bring up the latest build log and I see that one of the unit tests failed in release mode. Tyson, who is sitting at the station next to ours, says, "Oh yeah, I know what that is. I'll fix it right now."

In less than 30 seconds, he makes the change and checks it in. A few minutes later, the build system reports a passing build, and everything is back to normal.

2:17 PM We identify the memory leak. It was a misuse of reference counting. To find it, we first wrote a unit test that showed it failing, and then we fixed it in the physics library. We check in our code.

2:18 PM We go to the war room and grab the next task. This one has to do with being able to expose different variables and functions on the demo to tweak them through a GUI. We sign up for the task and start working on it.

4:12 PM Another pair is discussing how to handle errors for some particular case. This is an important topic and it should be done consistently across all the code, so we have a quick discussion about it involving most of the team. Five minutes later, we've made a decision and we all resume our previous work.

5:40 PM We do our last check-in for the day. We're almost done with the task, but not quite. Even though we could stay another hour and try to finish it, we're both quite tired and we're starting to not think as clearly and make some mistakes. We can wrap this up tomorrow morning as soon as we get in. The important part is that we got to a state where we could check in.

We have a rule that nobody can check in code and leave. You have to wait for the build server to build the code successfully and pass all the tests. We keep build times short, so checking in before leaving the office usually means you have to hang around an extra four or five minutes. But if anything breaks, you need to fix it or revert what you did—there's no excuse to leave with a broken build.

While I'm waiting for the build server to finish, I check the pile of email that accumulated in my inbox during the day.

5:44 PM After a few minutes we get the green go ahead from the build server. Today was a pretty productive day, and at this pace, we'll definitely complete all the user stories by Friday. The demo we're putting together is also starting to look very cool.

One of the things that agile development, and especially pair programming, does is to make each day very intense. There are no little breaks to read email, check a web site, or just goof around. We get a lot accomplished in a work day, but we can't keep that pace for a long time, so it's important to call it quits and go home. That leaves me with time at home to read technical books, prototype different ideas, or work on side projects in addition to unwinding, spending time with my family, and enjoying other hobbies.

I hop on my bike and head home with a big smile on my face.

— Noel Llopis

DESIGNER

WHEN *GAME DEVELOPER* ASKED ME TO WRITE ABOUT A DAY IN the life of a game designer, I thought it would be a good opportunity to show that less than half of the job is actually designing games. At least, that's how it's been for me so far, for better or for worse. There's a lot of detective work, personnel issues, and general wrangling that goes on. But then that moment comes when someone says, "Hey, let's implement [insert terrible design idea]" and you get to explain exactly why it shouldn't be that way and show examples of games that did it right and games that did it wrong. And you, the game designer, get to sleep at night knowing that you went to bat on that issue for the gamers of the world.

9:30 AM I arrive at work and check my email. There's something about how this or that Maya plug-in (for the level designers) has been updated.

Another email to the designer mailing list asks if the chain gun turn-rate feels OK in the game I'm working on. I stand up and look over my desk partition to tell the other designers that the chain gun camera is totally horrible right now and that I can't change it because it's currently using the same turn variables as the free-look camera. I'm waiting on programmers to separate those variables, I tell them.

I overhear one level designer ask another if he's updated the build yet, and the second designer says no. The first one laughs and says, "Don't. It won't run."

I feel my time is better spent playing detective on what's wrong rather than tuning the weapons in yesterday's build, so I start the update process, which takes a few minutes. Meanwhile, I read Gamespot.com and Gamasutra.com.

10:00 AM The build is indeed broken and it crashes on startup with no error message. I check an email folder that lists every check-in to CVS (the bad, free version control system we use) since last night. There are 300 such check-ins, most of which

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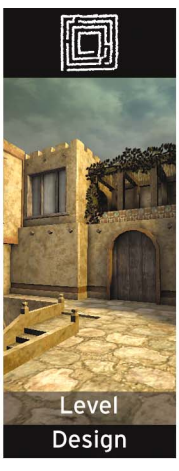

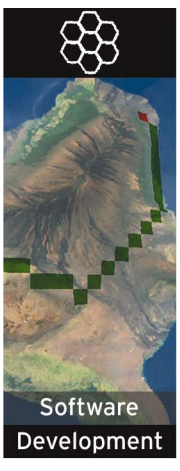

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appear to be from some batch export of art—with no check-in comments. Thanks guys!

I don't really know what's going on with that, but there's usually a bunch of art stuff like that message so I ignore it. There are a few check-ins from level designers, but I doubt they are causing the problem since the whole game crashes. There's no new executable, so the problem must be with a scripting file somewhere.

I read the check-in comments of the files that actually have them. I muse for a moment about why we allow any files to be checked in at all if they don't have comments about what is changed.

My Spidey-sense tingles when I read a comment about a new movement state for trooper enemies. I roll back one of the trooper files to yesterday's version to test if it's causing the problem, but the build still crashes. I roll back all the trooper AI files to yesterday's version and the game runs. I tell the other designers what they need to do and write an email to the programmer who did those check-ins. He was here late last night and isn't in yet.

David Sirlin's workspace.

David Sirlin is a game designer at Backbone Entertainment.

11:00 AM I play through one of the levels and write down notes about what was too hard or too easy. There are some things I can change to affect difficulty, such as how the weapons work, how much damage they do, and how many hit points the enemies have. For other things like ammo, health, and enemy placement, I have to go to the level designer.

Changing weapon variables will affect difficulty on every other level, but I'm still in that tuning phase, so it's OK. It seems that the shotgun is just way too effective, so I tone down the spread angle and increase its ammo usage. I test these changes in a test room with a few enemies.

An effects artist wanders by my desk and asks his usual question: "What's the worst effect in the game?" I say, "The rocket explosion. It's too small and weak." He says OK and walks away.

It looks like people are going to lunch, so I go.

12:00 PM Lunch involves a stop at EB and/or Best Buy. We are all valued customers at EB and the sales staff always give us whatever hookups they can.

1:00 PM I go over my level notes with one of the level designers. I explain that the huge spider enemy is hard in a good way and that we should add another encounter with that enemy in this level and in these other two levels. I tell him about how this platform distance was too far, this wire-slide was too hard to reach, and there weren't enough guys in this other part of the level. We both look over the level in Maya as he makes some changes.

2:00 PM There's a design meeting in which we all state what we're working on. I bring up the issue of the health meter. The game starts with the health meter only one-third full, and when the player finds health extenders, he is able to fill it up more. This is very confusing because at the start of the game, you see this black region of your meter that you think you can fill up, but you can't. Why doesn't the meter just get longer like in every other game?

I challenge the designers to name one game in the entire history of games that has this kind of health meter. No one can (though Resident Evil 4 would have been an answer). It's decided that the art team will try to do some other kinds of health meters. For some reason, this is a touchy subject, so I take it on faith that someone higher up than me will solve this.

Anyway, after summarizing what we're all working on, we break and go back to work.

3:00 PM I get the latest build from CVS and read the World of WarCraft forums for a while. I muse about why Blizzard has such bad PR and I wonder why warlocks [in the game] remain in their broken state for months on end.

3:15 PM I play the new build and notice a few collision problems in one level. The character keeps getting stuck along the edges of one room.

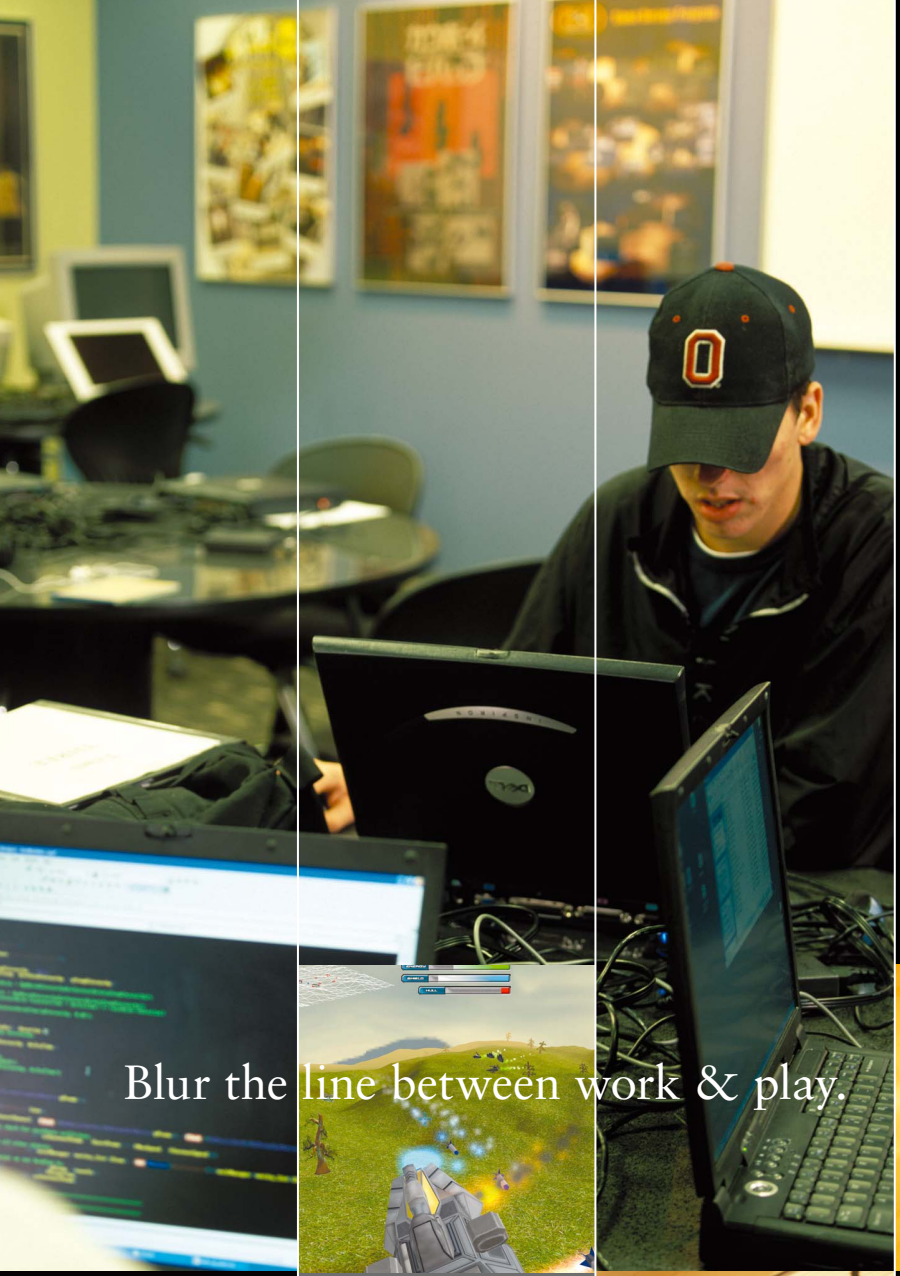
Because of some weird politics between the design and art teams, at one point we were told to run all the collision issues through our leads, which causes four people to be involved in one problem. This four-person relay is too inefficient to handle all these little details, so sometimes (including this time), the level artist and I just meet "secretly" outside. I tell him what collision problems I found, and he says he will fix them in less than five minutes. He does, and checks in new files, and I test it. It works great.

4:00 PM I do some more play testing and tuning. I play through a few levels to see how low on ammo I get with the current settings and make notes on which values to change for tomorrow.

6:15 PM The effects artist comes to my desk and tells me to get the latest version of his rocket effect. It's much improved.

6:30 PM I go to Starbucks, then go home, probably to play World of WarCraft. During the nine-minute uncancel-able gryphon flights, I practice Guilty Gear XX combos on PS2.

—David Sirlin



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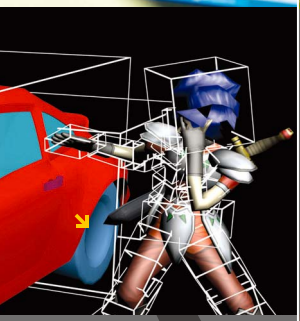

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ART FROM YOHOHO! PUZZLE PIRATES, COURTESY OF THREE RINGS

IT'S ALIVE!

FROM CONCEPTION TO PROFIT: THE LIFE AND TIMES OF INDIE GAME COMPANIES

ANDY SCHATZ *is president of Pocketwatch Games, whose first title,* Wildlife Tycoon: Venture Africa, *is due out in September. Email him at* ***aschatz@gdmag.com****.*

STARTING AN INDEPENDENT GAME COMPANY IS LIKE BUILDING FRANKENSTEIN'S monster: You design the creature, stitch together whatever parts you can find that best fit your intentions, and then experiment madly, trying to spark its first jolt of life. Thousands of brash Dr. Frankenstein developers across the world believe they can create a better game, a better company, a better existence. Their stories depict the trials and triumphs of bringing an indie game company to life.

THE DOCTOR: WHO ARE THESE CRAZY "INDIES?"

Reverence toward innovative game design is the organizing principal behind the indie game development community. Lack of money, on the other hand, is the biggest limitation to that community—and pushing innovation without strong financial backing is nearly impossible in almost any industry. So what kinds of people start successful indie game companies, what gets them over this hump, and what makes them successful?

Most indie game companies can't afford to employ full-time game designers. For those hoping to make a living off the sales of their games, their lead designer must be able to pull off more than one role in the business, stretching outside the realm of designer wherever he's needed, likely learning how to be mindful of business and marketing as well as talented in art or programming.

Brad Wardell, CEO of Stardock, is a Renaissance man of this sort. When Stardock started in 1993, Wardell was the sole programmer, designer, and producer. He even contributed most of the art for the company's first game, GALACTIC CIVILIZATIONS. As Stardock grew, Wardell was able to hire additional employees to take on some of these roles, and the company now enjoys a pretty stable existence, especially compared to other indies.

Of course, not every indie is out to make a living. Many modders (people that modify existing games with new rule sets or art assets) want to try building a game from the ground up. Groups of students sometimes organize small game teams just for the challenge of making something fun. Mohan Rajagopalan started a pair of game design courses at Cornell University. He and his colleague, Tom Wexler, enlisted their fellow teaching assistants to make the game RED VALKYRIE as well as their upcoming title, code-named RUNE WEAVER—a cross between a fantasy RPG, the classic game LEMMINGS, and the recent indie hit OASIS.

Games made by groups like these sometimes lack the polish that their economically-hopeful brethren have. Fortunately, and more importantly to the designers, the small-fry game can be wildly more innovative in its design; nothing is riding on whether it will be a sure thing. Conversely, big-selling games, by the very nature of their design or licensed intellectual property, must make a stronger promise to be successful or else they won't be signed to the big publishers, which are often not willing to compromise the investment by parenting a risky yet innovative game. Many of the truly innovative game designs come from indie game companies that never expect to receive massive compensation for their work.

THE MONSTER: TRAITS OF THE COMPANY

Let's face it: Most indie game companies with hopes of profitability will nose-dive before they even release their first game. So what gives a company the longevity it needs to make it to a release party?

The first rule, according to Daniel James, CEO of Three Rings, is to "make sure you pick a small-scale, achievable project, and then do it. I hear about too many mates who dither about for years 'waiting for funding' for a grandiose game plan, when they could have made a small-scale game or two in the same time."

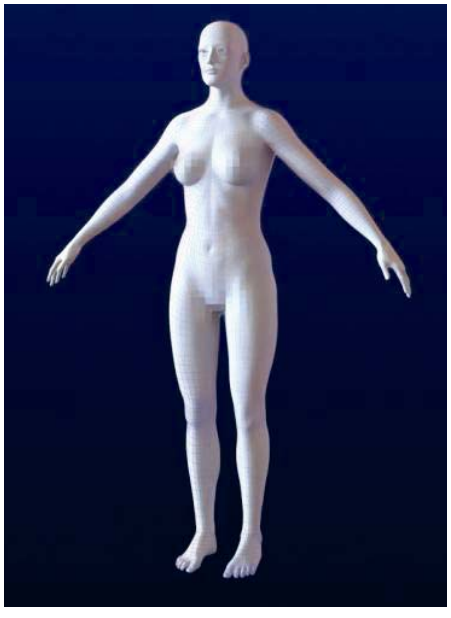
In the case of Three Rings' first product, YOHOHO! PUZZLE PIRATES, its initial funding was enough for them to turn many "small-scale, achievable" games into a single product. This kind of persistence, however, requires both planning and, needless to say, a solid business plan. (There are lots of resources on putting together business plans. The gaming portal www.dexterity.com has some interesting papers on the subject and are worth looking at for anyone harboring startup dreams.)

As James implies, the most pressing problem for an indie startup is money. Since indie game advertising often is nothing more than word-of-mouth, a good game may not reach profitability until a year or more after its initial release, leaving a span of almost two years before a solid income is generated.

To survive this dry time, many indie developers will dip into their personal savings, or, if they have already established their careers, work full or part time in another job. Independent developers have even been known to refinance or sell their homes to fund their game projects. Others raise money from family and friends to offset costs. Ben Nichols, an experienced indie developer, recently founded Metanima, a cell phone game company. For his latest venture, Nichols raised money from investors by shopping a detailed business plan to "sell the dream." By keeping the goals modest, Nichols' company was able to meet its promises and pay back the faith of its investors.

However, Nichols didn't always work from such a methodical approach. During the

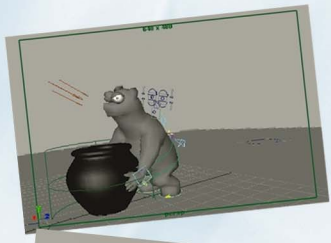
A number of free, open source resources are available online, including 3D models from Zygote Media. The models come in .obj format and can be opened by most major 3D packages. (Also see the sidebar "Open Source Alternatives.")

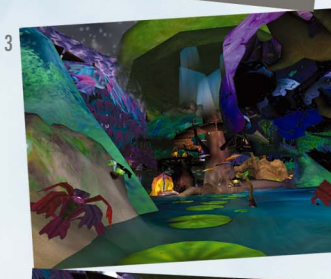


2 NEW PROGRAMS

* **Simulation & Virtual Environments** (BS)
  Starting in Fall 2005

* **Computer Animation** (MFA)
  Starting in Winter 2006





DEGREE PROGRAMS OFFERED:

- Simulation & Virtual Environments (BS) NEW
- Computer Animation (MFA) NEW
- Advertising (BS)
- Fashion Design (AS/BFA)
- Fashion Marketing & Management (AS/BS)
- Game Art & Design (BS)
- Graphic Design (AS/BS)
- Interactive Media Design (AS/BS)
- Interior Design (BS)
- Media Arts & Animation (BS)
- Visual & Game Programming (BS)

AS = Associate of Science, BS = Bachelor of Science
BFA = Bachelor of Fine Arts, MFA = Master of Fine Arts

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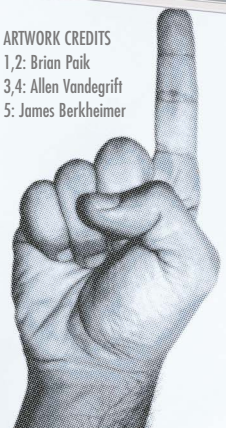
Fall classes start October 3rd

ARTWORK CREDITS
1,2: Brian Paik
3,4: Allen Vandegrift
5: James Berkheimer



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beginnings of Chronic Logic, an earlier company that Nichols also co-founded, decisions were dealt with as the problems arose, which lead to a lot of arm wrestling between the founders. Eventually, Chronic Logic did reach solvency but only after several strained friendships and significant financial stress. At one point, co-founder Josiah Pisciotta was down to spending a dollar a day on food, and programmer/designer Alex Austin was living in the office to avoid paying rent. Despite these early troubles, Chronic Logic persisted (after buying out Nichols) and managed to release GISH to much critical acclaim in 2004.

BUILDING BLOCKS OF LIFE: INDIE TOOLS

With today's content-heavy commercial games and the consumer environment that prizes them, a game is only as good as the tools used to make it. Games from studios like Electronic Arts and Sony compete with each other in the quantity and density of content in addition to innovation of game design. This philosophy has spawned some incredible toolsets, such as Valve's Source engine and Epic's UNREAL engine.

Compared to the large-scale commercial gaming world, many of the free, open-source tools that some indie developers use are sub-par. So how does a poor indie get by?

Jeff Tunnell of GarageGames has seen the evolution of the indie community's tools firsthand. Five years ago, GarageGames began to provide tools to an extremely small, but quickly growing market. They created the Torque Game Engine from the engine used for TRIBES, and single-handedly created a thriving community around this game development tool.

Because so much of the indie game development world is non-commercial, this and other indie communities are quite supportive of each other, often to the extent of sharing toolsets, assets, and knowledge. This situation has led to some high-quality open source tools (see the sidebar) and online art repositories like TurboSquid.

SELLING TO AN APATHETIC AUDIENCE

How do indie game companies sell their games?

Clark Fagot of BraveTree Productions tried a lot of different marketing strategies when marketing their family-friendly multiplayer first-person shooter game, THINKTANKS. BraveTree advertised its game with banner ads, made a version that was playable from a web browser, posted the game on a plethora of

game download sites, and released it exclusively for Mac before porting it to PC and Linux. For BraveTree, no single trick caused them to reach the tipping point of sales into profitability, but instead it was the cocktail of marketing and advertising that pushed them over the edge. Most importantly, word of mouth from a core, devoted fan base sold ThinkTanks.

Anything that generates or promotes word-of-mouth hype will drastically increase sales of an independent game. A timely game like The Political Machine from Stardock practically sold itself. The company's previous game, Galactic Civilizations, was also picked up by a publisher, though Wardell says Stardock retained the rights to distribute it over the Internet. Buzz generated by the off-the-shelf sales further contributed to the success of the download sales.

Profitability also depends on how much of the money the developer can keep. It's not uncommon for a publisher or game download portal to take up to 85 percent of the earnings. While this may seem unfair, having a publisher can increase the sales of a game drastically. Brad Wardell of Stardock warns that "many game developers I've encountered get hooked on the percentage they receive instead of looking at the actual dollar value they'll get."

THE SPARK OF LIFE: MAKING A LIVING

If it were easy to make a living making indie games, everyone would do it. And if it weren't possible at all, no one would do it. So how do the successful indie companies make payroll? And what does payroll look like for them?

Take a look at the longevity of Stardock, which started in 1993, and you can see that it's possible. When the company kept the online publishing rights to Galactic Civilizations in 2003, it independently sold 15,000 copies at $45 each.

Three Rings, makers of Puzzle Pirates, netted just over $500,000 in revenue in 2004. The initial investment, spread out

Open Source Alternatives

The GIMP	Alternative to Adobe Photoshop	www.gimp.org
Milkshape	Modeling and animation	www.swissquake.ch/chumbalum-soft/ms3d/index.html
Blender	Modeling and animation	www.blender3d.org
CVS	Source and revision control	www.cvshome.org
WinMerge	Code merging	http://winmerge.sourceforge.net
PopCap Games Platform	Code framework	www.popcap.com
Game Gardens	Java-based multiplayer code framework	http://www.gamegardens.com
OGRE	3D rendering engine	www.ogre3d.org
Open 3D Project	Free 3D human models	www.zygote.com

over 4 years, was $800,000. The company, with only the one game in its portfolio, is hoping to up its revenues to at least $1.2 million this year to get back into "happy profits land," as Daniel James puts it. Three Rings employs six full-time "mateys" as well as nine part-time online moderators.

BraveTree also has only one released game to date, ThinkTanks, which though polished, is not particularly innovative in game design. Yet, according to Clark Fagot, ThinkTanks was a "minor indie hit" and made enough to support one full-time employee comfortably over the first year and a half. However, considering that BraveTree employed five people before being acquired in June by GarageGames, ThinkTanks, while modestly successful, is no pot of gold.

Compare Three Rings and BraveTree with the less fortunate story of Fagot's high school buddy, Chris Cole. Cole, a 17-year veteran of the game industry, started Monster Studios in 1999 and spent three years writing a rendering engine and a game from the ground up. When he released Chain Reaction, a 3D update of The Incredible Machine, the game felt fresh and was reviewed well; but commercially speaking, it flopped. In the first two years after its release, Chain Reaction made about $25,000, which, stretched out over the five years he spent working on the title, parses out to an annual salary of just $5,000. Take a look at the "Salary Survey" figures for game designers (pg. 29), and see how $5K per year compares for other industry vets of six years or more.

THE PURPOSE

For some, getting picked up by a publisher is the ideal endpoint and vindication of a cool game concept. Despite the fact that many indie game developers left the big studio world to get away from the typical publisher relationships, there's no question that having a publisher sell your title is likely to improve your company's cash flow, indie or no.

Alien Hominid is this year's success story in this regard (see the *Game Developer* May 2005 postmortem; see Resources). The game was picked up by publisher 0~3 Entertainment, and it was subsequently released it on all three major platforms. Another indie example, Marble Blast, found its way onto the Xbox. And Wild Earth, the 2003 Independent Games Festival Grand Prize winner, has been converted into a successful full-motion amusement park ride.

Of course, indie game developers more often discover that they can't make a living on titles alone. But they can do it if they sell other gear too, like game technology or non-game applications. Michael Songy of Pyramind Technology started his consulting business to provide game technology to big studios. Unlike many indie game companies, he has discovered that as a consultant, he can't limit himself to products he is passionate about. With game production, pride of ownership and passion for the product are key success factors, but with consulting, he has to be driven to succeed by other factors. "We are developing our own intellectual property that we are all very passionate about, and our consulting business is the cash engine that funds our internal development," says Songy. "Our consulting business also allows us to build relationships with customers that may be strategically valuable to help take our IP and products to market."

Stardock supplements the income from its games by selling Windows utilities. BraveTree Productions sells art assets built for the Torque Game Engine to help fund its development. Jeff Tunnell of GarageGames urges the developers his company supports to fill out their indie portfolio with a wide range of products. In other words, the indie community is not just about games.

INDIE COMMUNITY: STATE AND FUTURE

Where do indie game companies stand on the food chain? Pretty near the bottom. And don't expect that to change. The very nature of the indie development community is that it fills the small niches that larger publishers don't know about or don't care about. When an indie company discovers a new niche, you can expect that a big publisher will move in on it sooner or later.

The cost of game development is extremely prohibitive. Time accounts for the bulk of it, but software can eat up a good chunk of your savings as well. Luckily, there's a cache of free tools available on the web (see the sidebar, pg. 25), and anyone considering an indie career in games might do well to test some of them out.

A slowly increasing recognition from the mainstream gaming world and a widening customer base are aiding the cause of indie developers, too. While the commercial game industry may decry the loss of small commercially-funded studios, some indie game developers have found a way to fill the role that they once played.

As the number of indie game developers grows, so will the power of the community. Hopefully, as collaboration increases, and the cash flow becomes a little more forgiving, the indie game developers can begin to thrive as the noble bottom-feeders of the video game industry.

RESOURCES

For related stories on independent game developers, see Gamasutra.com:

Hallam, Simon. "Indie Postmortem: Reflexive's Wik & The Fable Of Souls," Feb. 14, 2005.
www.gamasutra.com/features/20050214/hallam_01.shtml

Austin, Alex. "Indie Postmortem: Chronic Logic's Gish," Dec. 13, 2004.
www.gamasutra.com/features/20041213/austin_01.shtml

Dennen, Paul. "Indie Postmortem: Nayantara's Star Chamber," Oct. 27, 2004.
www.gamasutra.com/features/20041027/dennen_01.shtml

Wardell, Brad. "Postmortem: Stardock's The Political Machine," Oct. 11, 2004.
www.gamasutra.com/features/20041011/wardell_01.shtml

Wardell, Brad."Postmortem: Stardock's Galactic Civilizations," May 7, 2003.
www.gamasutra.com/features/20030507/wardell_01.shtml

Micek, Gregory and Russell Carroll. "IGF 2005: Student Showcase Finalists Preview," March 2, 2005.
www.gamasutra.com/features/20050302/micek_01.shtml

Related *Game Developer* postmortems:

Fulp, Tom and John Baez. "Indie Power! Riding the FBI with Alien Hominid," May 2005.

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GAME DEVELOPER'S 4TH ANNUAL SALARY SURVEY

NEW CONSOLE DEVELOPMENT, IN 2004, WAS OLD NEWS. BUT THAT DIDN'T stop the money from rolling in. Retail sales figures for video game software have flourished, reportedly reaching somewhere between $2.9 billion and $7.3 billion, depending on how computer software is counted. Electronic Arts and Activision have shown strong growth in the past year, with THQ, Square-Enix, and Ubisoft also showing impressive results.

In addition, the massive growth of the online and mobile gaming markets in North America, and the rise of ancillary markets such as serious games, are also spurring the industry on to greater heights.

In short, there's money to be had—but who's making it?

For the fourth year running, *Game Developer* conducted a salary survey across all disciplines of the game development community in search of an answer. This year, we've included previously forgotten players of our industry: business and legal.

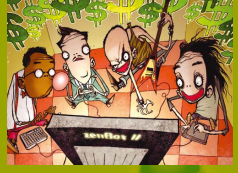
ILLUSTRATION BY MATT TIMSON/THREE IN A BOX

METHODOLOGY

With the help of research firm Audience Insights, we sent email invitations to *Game Developer* subscribers, Game Developers Conference 2004 attendees, and Gamasutra.com members in January 2005 inviting them to participate in our annual salary survey.

Although we received 3,913 unique responses worldwide, not all who participated in this survey provided sufficient compensation information to be included in the findings. We also excluded cases in which the compensation was given at less than $10,000 or greater than $300,000 or if there was text entered that did not readily correspond to a compensation figure. We further excluded records missing key demographic and classification information. Finally, this report is of the U.S. compensation only, excluding approximately 1,389 otherwise valid respondents from outside the U.S. So the total sample reflected in the compensation data presented in the following pages is 2,091, smaller than the original number of respondents, but still very comprehensive.

The sample represented in our salary survey can be projected to the overall game developer community with a margin of error of plus or minus 2.1 percent at the 95 percent confidence level. The margin of error increases for specific subgroups reported within this community.

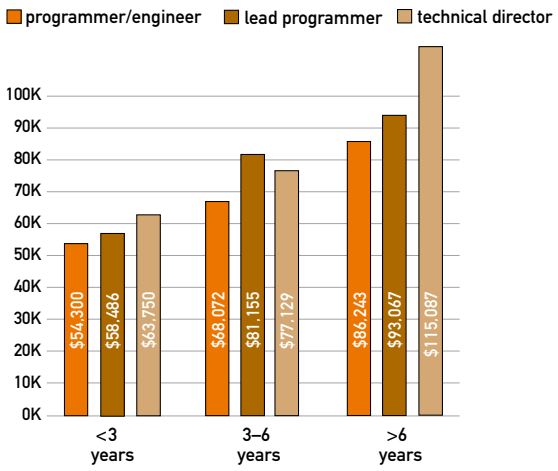


PROGRAMMING

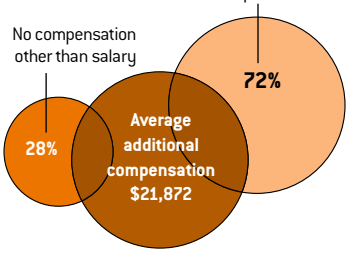
NO MATTER THEIR SPECIALIZATION—AI, PHYSICS, GRAPHICS engine, networking, and so forth—programmers continue to earn relatively more than developers of all other disciplines across all levels of experience. This is especially true for industry veterans of six or more years, likely due to the rarity of experienced console engineers.

Interestingly, salaries for the least experienced programmers dipped somewhat compared to the previous Salary Survey, possibly due to a proliferation of college graduates moving into an ever-increasing raft of entry-level positions, as well as existing programmers becoming older, more seasoned, and thus shifting brackets.

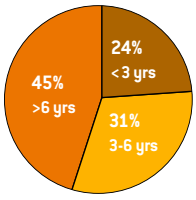
Programming salaries per years of experience and position



All programmers and engineers



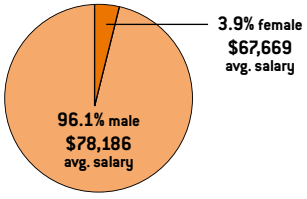
Years experience in the industry



Type of compensation

Annual bonus	53%
Project bonus	25%
Royalty	23%
Stock Options	44%
Profit Sharing	21%

Average salary by gender



Highest salary
$211,500

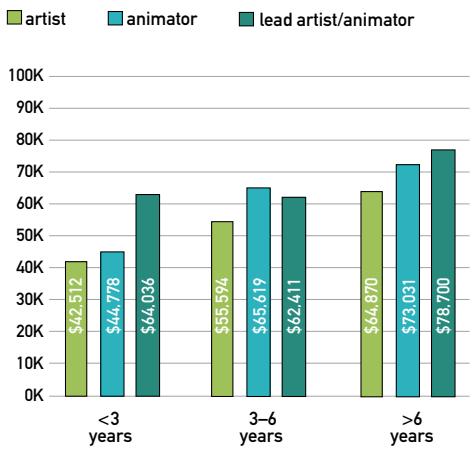
ART AND ANIMATION

LEAD ARTISTS/ANIMATORS REPORTED THAT THEY MADE significantly more money in 2004 than 2003 across all levels of experience, but the increase was particularly fruitful for animators with three or more years experience; for those straightforwardly titled "artists," salaries increased only marginally.

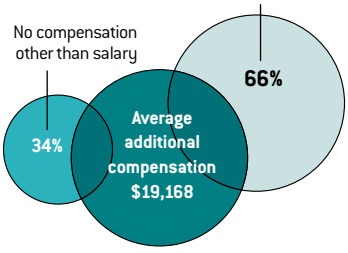
Also, though some artists worry about burnout, it's clear that many are sticking around. Forty-four percent are veterans of six or more years, compared to just 37 percent last year.

Finally, although artist salaries generally come in at significantly less than coders' for those with similar experience, the highest individual salary for any artist was $220,000, beating out the top programming salary of $211,500.

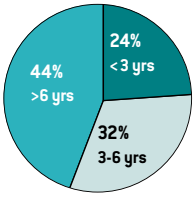
Art and animation salaries per years of experience and position



All artists and animators



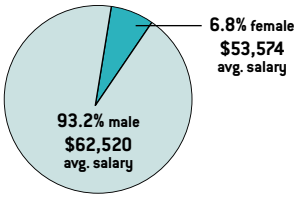
Years experience in the industry



Type of compensation

Annual bonus	53%
Project bonus	31%
Royalty	37%
Stock Options	35%
Profit Sharing	16%

Average salary by gender



Highest salary
$220,000

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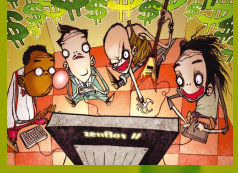


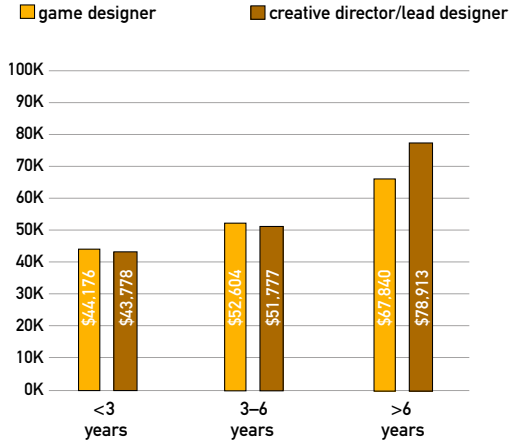
GAME DESIGN

"I WANT TO MAKE VIDEO GAMES WHEN I GROW UP."

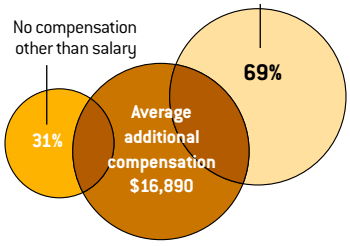
For the bright-eyed, prepubescent children who make this statement, it loosely translates to "I want to be a game designer." (Here, the term comprises game designers, level designers, and writers.) The job sounds idyllic to those not really in the know, but it's competitive as hell. College graduates (or even talented drop-outs) vying for a position as a game designer will find adequate entry-level salaries as a result of the competitive nature of the title. Increases in pay tend to be more commensurate to experience than title, at least for the first few years in the industry.

The best advice I've heard for budding designers: Find yourself an experienced mentor. Listening and asking questions of others might be the best way to negotiate the path between designer and lead, even if the pay is relatively static between titles.

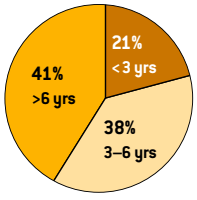
Game design salaries per years of experience and position



All game designers



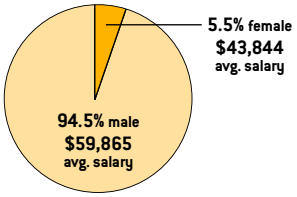
Years experience in the industry



Type of compensation

Annual bonus	44%
Project bonus	32%
Royalty	32%
Stock Options	36%
Profit Sharing	26%

Average salary by gender



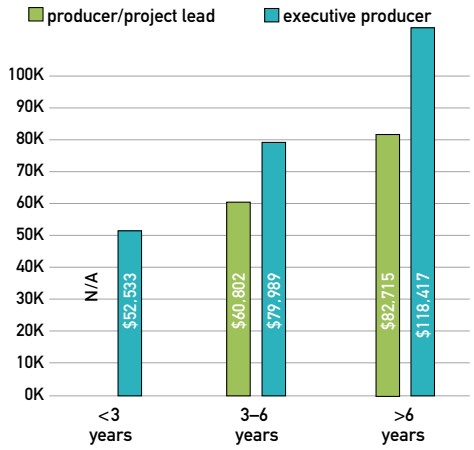
Highest salary
$190,000

PRODUCTION

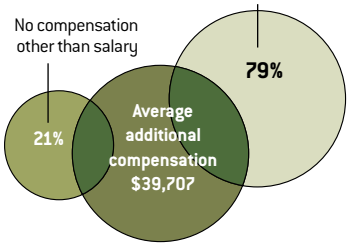
PRODUCERS ARE THE SHEPHERDS OF THE DAILY GRIND, managing all the details from relationships, to schedules and budgets, and make a pretty decent base salary. From our reported figures, producers who stick with it for at least six years will earn cushy payoffs for their time; and compensation other than salary is among the highest in the industry for this group.

But where do producers come from? It's been said in the past that the producer's title is what many QA personnel and support staff aspire to. But as the game industry stretches its wings in the entertainment sector, we could see more experienced professionals coming into games from other industries by using this directorial title to their advantage.

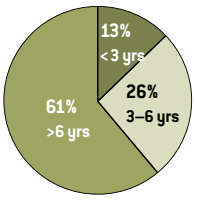
Production salaries per years of experience and position



All production



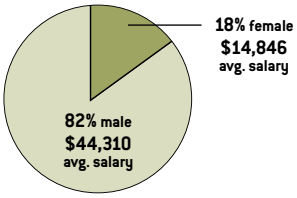
Years experience in the industry



Type of compensation

Annual bonus	60%
Project bonus	25%
Royalty	29%
Stock Options	55%
Profit Sharing	16%

Average salary by gender



Highest salary
$210,000

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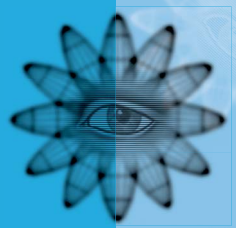

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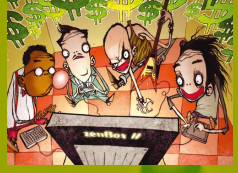
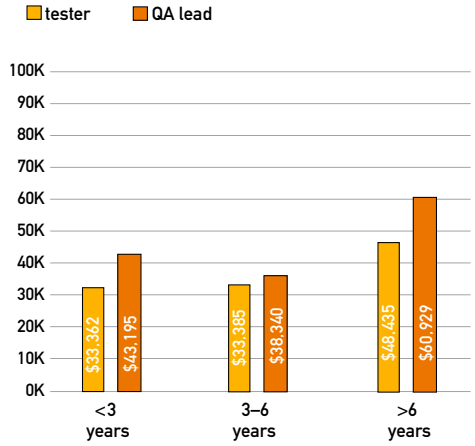


QUALITY ASSURANCE

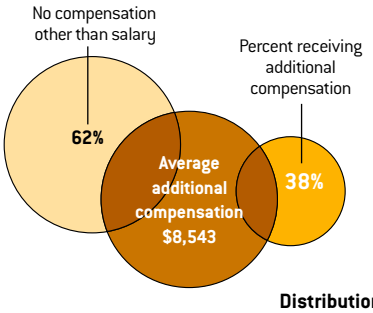
RESULTS FROM THIS YEAR'S SALARY SURVEY INDICATE THAT not everyone in the industry is rewarded for several years of service. QA employees who have been in the industry for three, four, or five years, on average, don't make much more than their fledgling counterparts. What's the message? That a rookie is as valuable as an experienced QA person?

Fortunately, there's an upside: QA has traditionally been a position in which non-technical game enthusiasts could get their foot in the door, and, anecdotally speaking, that doesn't seem to have changed much over the years—it's still an excellent path to game design and production-related positions.

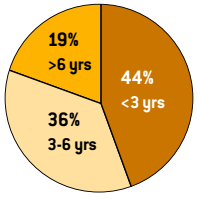
QA salaries per years of experience and position



All QA



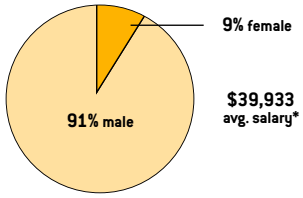
Years experience in the industry



Type of compensation

Annual bonus	64%
Project bonus	10%
Royalty	10%
Stock Options	44%
Profit Sharing	15%

Distribution of gender



Highest salary
$225,000

*Average salary by gender N/A.

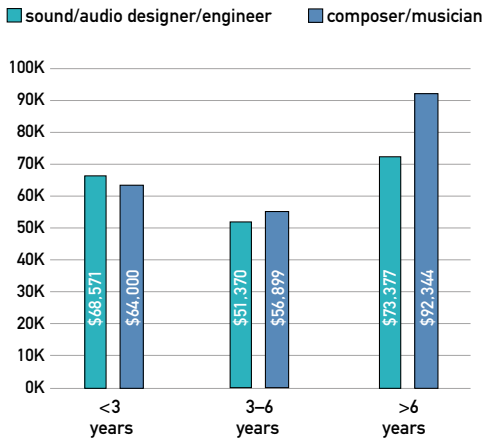
AUDIO

LICENSING MUSIC IS IN. OR IS IT?

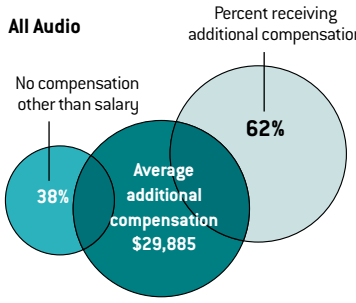
Experienced audio engineers and musicians, directors, and composers this year have recorded their salaries as being markedly higher than last year, especially for entry-level musicians. Audio and musical people with more than six years experience can, in the game industry, make a salary on par with programmers with equal years of experience.

Unfortunately, we received the fewest number of (usable) responses from people in the audio category: a scant 63, perhaps reflecting the fact that many musicians don't work solely in games. Additionally, so few lesser-experienced audio recruits responded that it discourages a deeper analysis of wages in this discipline.

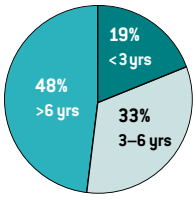
Audio salaries per years of experience and position



All Audio



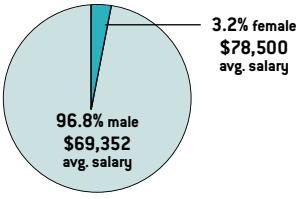
Years experience in the industry



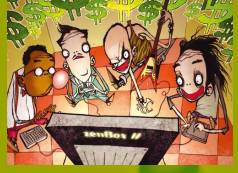
Type of compensation

Annual bonus	46%
Project bonus	49%
Royalty	49%
Stock Options	35%
Profit Sharing	24%

Average salary by gender



Highest salary
$225,000



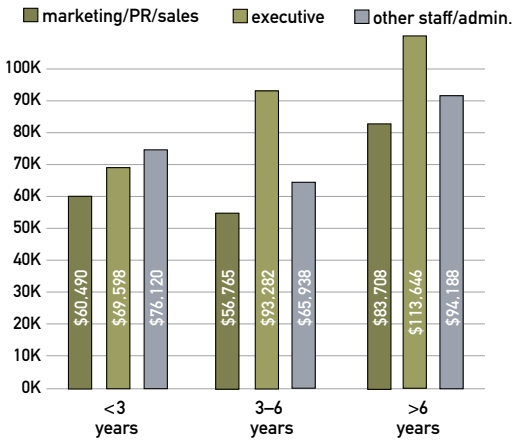
BUSINESS AND LEGAL

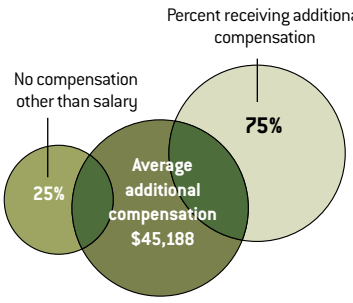
MATURATION OF THE GAME BUSINESS IS A SURE THING, AND AS IT expands, the scope of its people must also expand. New to the salary survey this year are respondents who classify themselves in the business and legal category—people who we must include in our community and game creation business plan, since without them, no thriving company would have a business plan at all.

For the purposes of the survey, business and legal breaks down into three groups: marketing, public relations, and sales; executive; and other staff or administration.

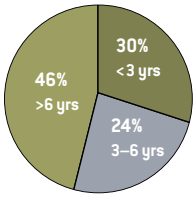
There are a surprising number of business and legal professionals who are acclimated to the game industry's unique climes. Their higher salaries might be attributed to commission or simply rank and file, in the case of executives. But like developers of all disciplines, these people usually know games, so let's not discount them just because they don't AI script like maniacs.

Business/legal per years of experience and position





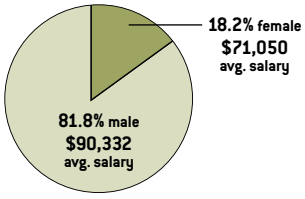
Years experience in the industry



Type of compensation

Annual bonus	56%
Project bonus	21%
Royalty	16%
Stock Options	46%
Profit Sharing	29%

Average salary by gender



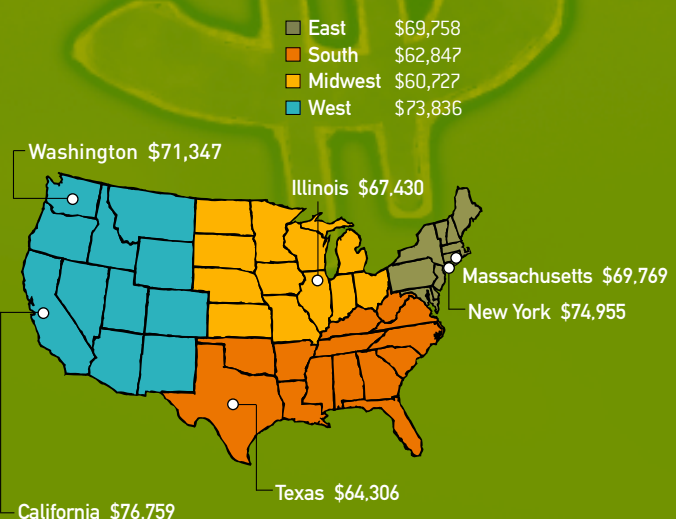
Highest salary
$256,000

NATIONAL TRENDS

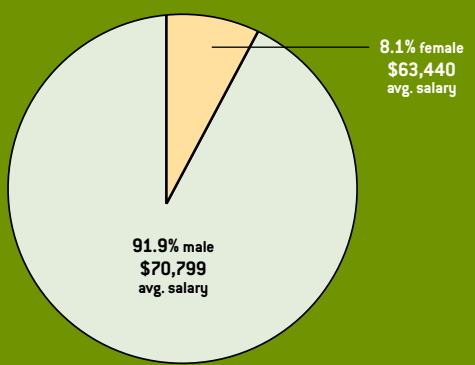
OF THE MAJOR HOTBEDS FOR GAME DEVELOPMENT BY STATE, salaries for Californians fared well, with the average at $76,759, up nearly $5,000 from last year's survey. This year, we've also added two average salaries by state, Illinois and Massachusetts, to better represent the Midwest and East regions, since a prominent number of respondents work in these states. Of the major states, salaries were lowest on average in Texas, although we can likely attribute this to the lower cost of living.

In terms of location, we could start to see more studios cropping up or thriving in some unexpected (or at least less anticipated) places. We had more than 30 respondents who reported to work in each of the following states: Utah, Maryland, Virginia, Florida and Oregon.

Females accounted for little more than 8 percent of all respondents in this year's survey, a marginal 1 percent increase over last year's turnout. But their salaries are reportedly closer to males' this year than last in game development-related fields, with females on average earning $0.90 to the dollar. Last year, the outcome was slightly lower at $0.87 per dollar; and for 2002 salaries, $0.89 per dollar.



Overall average salary by gender



matt gilgenbach and daniel sass

DANIEL SASS *is a lead programmer at Heavy Iron Studios, a division of THQ, Inc. Email him at* ***dsass@gdmag.com****.*

MATT GILGENBACH *also works for Heavy Iron as a software engineer. Email him at* ***mgilgenbach@gdmag.com****.*

SO YOU WANT TO BE A GAME PROGRAMMER

HOW TO GET OUT OF COLLEGE AND INTO GAMES

HOW DO YOU GET STARTED IN THE GAME INDUSTRY RIGHT OUT of college?

This task is not a particularly easy one mostly because a lot of people want to do the same thing and there are only a limited number of junior positions available for fresh college graduates.

From our years in the game industry, and from what we observe of junior-level programmers and designers today, we've put together some basic information on how you might break into the industry straight out of college. If you want to make yourself stand out in the sea of inexperience, you need four things:

- a tight demo
- a clean and professional resume
- some experience
- a pragmatic idea of what to expect.

THE DEMO

FINISH YOUR GAME OR DEMO. When something is finished, it shows persistence, a trait that's absolutely crucial to have to work in this industry.

"Finished" doesn't mean the demo meets your original goal of creating a complete game that rivals the current latest and greatest game. What "finished" does mean is that the game is fully functional and relatively bug free. Hence, this usually means you have to scale back your vision.

If your original vision was to create a 3D platformer with many levels and bosses, and your final product has only one level, that's okay. As long as that one level is totally complete and shows off your programming skills, it will be fine for a demo.

If you don't have an artistic inclination or know any artists, it's difficult to make a game or even a level. However, you can still work on technology. The one thing that's important to prospective employers is that you have a demo that shows off your programming prowess and technology (and that you have the persistence to finish it). But even if you write an engine that's better than the hottest game out there, no one is going to pay any attention to it if you only send them the source code or a demo that displays just five polygons.

CONTINUED ON PG 42

PHOTO BY TOM SPITZNAS

So real it renders fear.

Idea:

Create the most gripping and realistic stealth action game on the market.

Realized:

With *Tom Clancy's Splinter Cell® Chaos Theory™*, Ubisoft™ wanted to continue setting records for the visual gaming experience. That's why they chose Autodesk's 3ds Max software to model and animate the game's realistic characters and backgrounds. By providing a highly creative and stable platform, 3ds Max helped Ubisoft artists continue their impressive work on Tom Clancy's Splinter Cell series that has already sold 10 million copies worldwide. 3ds Max's robust, workhorse capabilities also helped Ubisoft stay on target with their grueling production schedules. As a result, Ubisoft met their highly anticipated launch and garnered a 9.9 out of 10 by *Official Xbox Magazine* because of the game's amazing looks and lifelike play. From taking out the competition to taking out the warehouse guard, Autodesk software helps today's top developers realize their ideas to compete and win. To learn more, please visit autodesk.com/3dsmax

Tom Clancy's SPLINTER CELL CHAOS THEORY

Tom Clancy's Splinter Cell® Chaos Theory,™ image courtesy of Ubisoft.

Autodesk®

SO YOU WANT TO BE A GAME PROGRAMMER

CONTINUED FROM PG 38

MAKE YOUR DEMO IMPRESSIVE. Most people who will evaluate your demo have a very short period of time to look at it, so make sure they will immediately know what's cool about it. If you write a complicated object modeler that rivals a professional 3D modeling package, no one will invest the time into seeing the features unless you point them out. If you want to show off your modeling program, then make sure the demo starts with an impressive model that was created in your package.

MAKE YOUR DEMO AS EASY AS POSSIBLE TO VIEW. Something that should be obvious, but that a lot of people overlook, is to make it as easy as possible to get at your demo.

The whole point of having a resume is to convince the potential employer that your demos are worth looking at—and once you've convinced them to view the demos, you need to make them as easily accessible as possible.

The people who receive your resume also receive hundreds of others, and they aren't going to give you much time. Don't waste the precious time they do give you by making them navigate a bunch of pages or folders to get at something that might impress them. Often, snail mailing your demo on a CD is the easiest way to get your demo viewed. When job screeners have an actual CD sitting on their desks, it's quite easy for them to pop it in their computer and view it, unlike job candidates who direct them to a web site to download a potentially large (and potentially infected) file.

If you don't want to mail your demo on CD, make sure your resume has a direct link to download the demos, as opposed to making the reviewers navigate your page to find it.

DO NOT SHOW OFF STANDARDIZED CLASS PROJECTS. Your demo should not be a class project for which everyone did the same thing. If your class project was to create the Utah Teapot from splines, then your work isn't particularly impressive; anyone who passed the class did the job just as well. Standardized class projects often downplay your unique talents and skills.

However, if you encountered more open-ended assignments, like "make a good video game" or "complete a project involving computer graphics," then your project—by its very nature—has an opportunity to express something about you and your abilities.

SPECIFICALLY TELL THE SCREENERS WHAT CODE IN THE DEMO IS YOUR OWN. Here's one of the worst scenarios that can occur during an interview: You play a demo, which only shows off graphics, and you proudly say you were the game designer.

You can only impress the people looking at your demo by showing them the work you did. It isn't impressive if you (as aspiring programmer) show a great looking demo from a graphics standpoint if you either used an existing graphics engine or had someone else write the graphics code. They will assume you aren't very good with graphics, thus marking a point against you where you shouldn't even have been assessed.

Instead, try to write at least a few, if not all, of the important components of your demo—graphics, animation, collision, physics, and AI—to show that you have expertise in various aspects of video game development.

Remember, you will be asked about your specific contributions to the demos you show. Be prepared to answer questions about them. And never, ever say, "I don't remember how I did that."

EXPERIENCE

HAVE RELEVANT WORK EXPERIENCE. Getting that first job in the industry is hard. Many people inside the industry feel like it's completely different from all other software development jobs and, to a certain extent, it's true. However, you still need to have experience to land your first gig. And there are many types of positions you can pursue.

First, if you are at a big university, there's probably a graphics research project at your school. Try to become a research assistant, which will help you gain basic work experience, like project management skills, a deadline-oriented attitude, and, most of all, a professional reference. If there isn't a graphics research project, then find a different research project and convince the professor that the project will benefit from 3D visualization. Computer graphics are very useful for a lot of different types of research because the same experiment can look much more successful with good data visualization—and if you can convince a professor of this point, you'll also gain experience at persuading others of the value of your talents.

GET AN INTERNSHIP WITH A GAME DEVELOPER. Some larger game development companies will provide internships for eager students. Don't expect to do glamorous work or even to get paid. However, this internship experience will both get you real world game programming experience and help you network with game developers.

The *Game Career Guide* from last year (2004) contains some valuable details about internships in the development community. Gamasutra.com also hosts listings for available internships (as well as part- and full-time positions).

GET PROFESSIONAL TEAM EXPERIENCE. Software development experience at a commercial software developer is also very useful. You may not be working on something exciting like graphics, but you will earn good and valuable work experience. Completing an internship in software development demonstrates that you have some level of general programming competency.

And I know what you are thinking: "My demos should show that and more!" Well, having commercial software development experience can also show that you can function well on a team, which is something a demo can't prove. We are long past the days when one person can create an entire console game, so a lot of your time in the game industry will be spent dealing with other people. Commercial software development experience is useful because you deal with managers, schedules, and ship dates, all of which are totally relevant in the game industry. Even if you created your demo with a team, everyone else you worked with was more or less on the same level, so that experience doesn't really show how well you interact with different people of various levels of expertise, people who are unmotivated or determined, flexible or

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stubborn, and so forth. Sometimes people who can put together the most impressive demo on their own are no good in a team environment because they can't take orders from someone else.

An ideal internship for an aspiring game developer nowadays would be one in which you would develop commercial software that has artificial intelligence or 3D graphical components. You may not think there are many of that nature, but keep looking. You may be surprised at what you find.

While it's good to have software development experience, don't be fooled into believing that years of non-game experience translates into an equal number of years of game development experience, as most companies do not treat them the same. Even if you manage to get two years of non-game experience during your college years, don't expect to enter into a company at the same level as someone who has two years of solid game programming experience. While an internship can help you get in the door, it won't get you higher up the ladder or allow you to skip taking an entry-level position.

LEARN ON YOUR OWN. Even if your college has the greatest game programming classes of any school in the world, you are not ready to get an entry-level programming position with this background alone. You need to learn to program on your own.

Being a self-taught learner is important for many reasons. First, it separates you from your classmates. Your classmates may have just gone through the curriculum, but ideally you went through it and much more since you were actively pursuing your interests in game development in your spare time. Supplementing your education with self-taught knowledge will separate your resume instantly from your classmates'—even if you're all from a prestigious school. Second, learning on your own shows you are personally motivated to learn about game development—the reason you're learning game development goes beyond getting good grades. People who work in this industry don't have teachers or curricula. Often, they are asked to do something for their jobs that not one person in the company has experience doing. Hence, if you can prove in your resume, cover letter, and interview that you are an avid, self-taught programmer, you should.

RESUME

IF YOU DON'T WANT TO BE ASKED ABOUT IT, DON'T LIST IT. Do not put classes or skills on your resume that you don't want to discuss in an interview. If you get a phone screening by a game development company, usually they start by discussing your resume. If you took a class and didn't succeed at it, didn't like it, or didn't understand it, do not list it on your resume. The class you dreaded could be your interviewer's pet interest, and he or she might want to ask you all about it. Not knowing much about something on your resume looks much worse than if it wasn't there to begin with.

DON'T LIE ... REALLY. Do not say that you were "project lead" or "CEO" of a company. In college, many people create a "company" or lead a small team of people who are making games.

While you may be very proud of your accomplishments, the people looking at your resume could very well be CEOs and project leads—and they know you don't have the same kind of experience they have. In fact, an over-exaggeration on your part might even be perceived as slightly insulting on their parts.

Lying, over-exaggerating, or including too many self-promoting titles on your resume makes it seem like you have a big ego and think your accomplishments are more substantial than they really are. For example, don't list that you've been programming since you were 10 years old; even if it's true, you won't be taken seriously.

To avoid over-exaggerations and egotism, separate your resume into multiple sections, such as work experience and personal projects—that way, you can still list your personal achievements, but they are just that: personal, not professional. Games that you worked on for fun in college should go into personal projects, unless you actually made a decent amount of money selling them as shareware. If you were part of team management and you think that the experience will help you, then describe your accomplishments in a less direct way by

saying, for example, "carried out some managerial tasks on project" to avoid giving the impression that you have a big ego.

DON'T WASTE SPACE WITH NON-RELEVANT EXPERIENCE. You want to fill as much of the paper with experience that you think will get you into games, so don't put non-technical jobs on your resume. If you've never had a technical job, then you likely need more experience before applying to a job in game development.

DO NOT PITCH. Do not under any circumstances say you have great game ideas that you would like to sell. Everyone thinks they have great game ideas, but no company is interested in buying them from a job applicant. Your resume will go right to the recycle bin.

Also, you don't need to tell the screeners and potential employers that you are a "fast" programmer at a software development job—you had better be fast in a regular software engineer position because the standards in game programming are much higher. Remember that a large portion of your graduating class wants to work in games. The competition is intense. Game development jobs go to those who can get the job done accurately and quickly.

Don't tell the screeners that you can quickly learn new programming languages, libraries, or SDKs—that's another basic requirement, and not just in game development, but in software development as a whole, and your resume experience should show it.

WHAT TO EXPECT

PROGRAMMER TEST. Sometimes a company will give you a programmer test before they'll bring you into an interview. Usually designed to see if you are worth bringing in for an in-house interview, these tests vary from company to company, so there's no standard way to prepare for them. If the interviewer informs you that you are required to take a programming test, don't ask him or her what to study for it. The idea of a programming test is to see what you know and what you don't know, not what you can cram into your head for a short period of time.

WEIGHTY INTERVIEW. The interview is going to be harsh. While you might have made it through an initial screening, you still may not be up to the company's standards. Whoever is interviewing you will grill you to try and squeeze every last drop of information out of your mind.

Needless to say, you'd better have a lot of knowledge. Recent college graduates are not expected to be experts on every aspect of game development (though the questions they ask might make it seem otherwise), but you still need to know a good deal. If you're asked questions that you don't know the answers to, try to answer them logically and calmly anyway. Part of what interviewers look for is how you work through a question that's probably above your head.

If you're asked a question and respond, "I don't know," it's a huge strike against you. If you're the type of person who immediately gives up when presented with a problem or challenge, then you aren't an ideal employee for a job in game development.

Here's a strategy for how to handle the above situation: Start by saying what you do know about the problem and indicate what information you'd need to solve it. Interviewers want to see your thought process. They might even offer you hints to help you solve the problem if you're headed in the right direction.

If, in an interview, you're presented with a math or physics problem, never say, "I'd just look the formula up in a book." If looking things up in a book is all you're good for, then the company can just purchase the book for a lot cheaper than they can hire you! Try to deduce the answer instead. You should also definitely bring up relevant information that you learned in your last two years of college; so if you have trouble with your assignments from then, review them before an interview.

YOUR FIRST GIG

YOU WILL BEGIN AT THE BOTTOM. You have to get your start somewhere, and that place is usually at the bottom. You may work for a company that pays way below the industry standard, which is already significantly below what your friends with traditional software development jobs will make. You'll probably have to work long hours for a small company making a sub-par game. Don't expect to get a job working on the next title in your favorite game series just because you're a huge fan. Your favorite game series probably got that good by hiring experienced people, and experience is something you lack coming right out of college.

Smaller companies working on lower budget games will be more willing to give you a chance—and you'll probably have more room to grow and experiment with new techniques in that type of environment. It may not offer you the best financial rewards, but you'll learn a lot and get experience, so you can move up.

WORD OF MOUTH. The game business is still extremely small compared to other high-tech industries. Word-of-mouth still goes a long way here, so your boss at a five-person studio may be a prime reference for (and personal friend of) the CEO at the next company you move to.

If you have the right experience and resume and have reasonable expectations regarding your interview and first job, you can definitely get your foot in the door of the game development industry. If you read this and are reluctant to work your butt off for low pay, then you should consider a field other than video games.

If you find math and physics confusing or you aren't a hardcore coder, then game programming probably isn't for you. If you still want to be involved in the game industry, there are many other positions for which a technical background also helps. Programmers make for great game testers because they understand the game's implementation, so they will be better at guessing what will break. Producers who have a good understanding of programming can have more reasonable expectations from the programming team. And game designers with a background in programming won't be intimidated by the task of scripting.

If you read this article and are still enthusiastic about doing what it takes, then there's a position in the industry waiting for you. Now all you have to do is find it.

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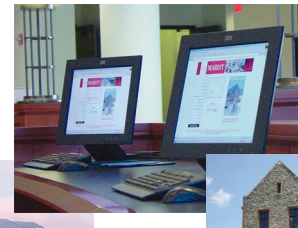

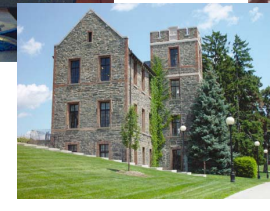

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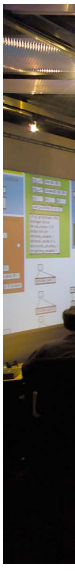
GAME SCHOOL DIRECTORY



ABBREVIATIONS

G	Graduate program
I	International students
NR	Non-state residents
R	State residents
U	Undergraduate program
AA	Associate of Arts
AAA	Associate of Applied Arts
AAS	Assoc. of Applied Science
BA	Bachelor of Arts
BFA	Bachelor of Fine Arts
BS	Bachelor of Science
MA	Master of Arts
MFA	Master of Fine Arts
MS	Master of Science
PHD	Doctor of Philosophy

EACH YEAR, THE *GAME CAREER GUIDE* PROVIDES A DIRECTORY OF institutions that offer educational or skill-building game development programs. Many schools have established self-contained game development departments, while others teach courses within a larger department, such as Computer Science or Fine Arts. Primarily, *Game Career Guide* lists schools in the U.S. and Canada, but a small sampling of international schools is available on page 72. For complete information regarding any school on this list, please consult the institution directly.

—Brandon Sheffield

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
3D-Online	Los Angeles, CA	Introduction to 3D Graphics Programming, Game Engine Fundamentals, Game Development and 3D for Web and Wireless Devices	Certificate
Academy of Art College	San Francisco, CA	Computer Arts (Game Design, 3D Modeling, 2D and 3D Animation, New Media, Web Design, Visual Effects)	AA, BFA, MFA, Online Programs
Academy of Game Entertainment Technology	Hollywood, CA	Level Design, Programming, Animation, QA Testing	Certificate
Alberta College of Art & Design	Calgary, Alberta	Visual Communications Design, Media Arts & Digital Technologies, Animation	BFA, Bachelor of Design
Algoma University College	Sault Ste. Marie, Ontario	Computer Science	BA, BS
Art Center College of Design	Pasadena, CA	Product Design, Environmental Design, Graphic Design, Illustration	BFA, BS
Art Institute of Atlanta	Atlanta, GA	Game Art & Design, Visual & Game Programming, Graphic Design, Media Arts & Animation, Multimedia & Web Design, Photographic Imaging, Video Production	AA, BFA, BA, BS
Art Institute of California–Los Angeles	Santa Monica, CA	Game Art & Design	BS
Art Institute of California–Orange County	Santa Ana, CA	Media Arts & Animation, Graphic Design, Game Art & Design, Multimedia & Web Design	AS, BS
Art Institute of California–San Diego	San Diego, CA	Media Arts & Animation, Multimedia & Web Design, Game Art & Design, Graphic Design	AS, BS
Art Institute of California-San Francisco	San Francisco, CA	Game Art & Design, Media Arts & Animation, Visual & Game Programming	BS

DISCLAIMER. All information contained in the *Game Career Guide 2005* game school directory has been provided by school officials and should be verified with the institution, including accreditation. The exclusion or inclusion of any institution in this listing, both domestic and foreign, does not reflect its merits, ranking (official or unofficial), or credibility. Figures pertain to the academic year 2005 or 2004 as updated by officials. All images have been provided courtesy of the institutions listed in this directory.

Student work from the Ex'pression College for Digital Arts

An Interactive Media classroom at the University of Southern California's School of Cinema Television

TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
Varies	Yes	No	6-10-week courses	6:1	310.406.1169	www.3d-online.com	contactus@3D-Online.com
$550.00 per credit (U); $600 per credit (G)	Yes	Yes	4 years (BFA); 2 years (MFA); 3 years (certificate)	15:1	800.544.2787	www.academyart.edu	info@academyart.edu
$1,100 per course, full-time prepaid per quarter	Yes	Yes	6-9 months	6:1	323.466.4300	www.academyofget.com	info@AGETedu.com
$1,908 per semester (Canadian students); $5,634.75 per semester (I)	No	Yes	4 years	20:1	403.284.7600	www.acad.ca	admissions@acad.ca
$2,074 CDN per term (Canadian students); $5,448.32 CDN per term (I)	Affiliate	Yes	4 years	25:1	705.949.2301; 888.ALGOMA.U	www.auc.ca	info@auc.ca
$12,400 per semester	Yes	Yes	8 semesters	Varies	626.396.2373	www.artcenter.edu	admissions@artcenter.edu
$375 per credit ($72,000 for 12-quarter BA and BFA)	Yes	Yes	6-12 quarters	16:1	770.394.8300; 800.275.4242	www.aia.artinstitutes.edu	aiaadm@aii.edu
$75,556 full tuition inc. fees	Yes	Yes	12 quarters	20:1	888.646.4610; 310.752.4700	www.aicala.art institutes.edu	ailaadmin@aii.edu
$75,786 full tuition inc. fees	Yes	Yes	7 quarters (AS); 12 quarters (BS)	11:1	888.549.3055; 714.830.0200	www.aicaoc.aii.edu	aiocadm@aii.edu
$75,556 full tuition inc. fees	Yes	Yes	12 quarters	20:1	858.598.1399; 800.591.2422	www.aicasd.art institutes.edu	aisdadm@aii.edu
$383 per credit hour; $6112 per quarter	Yes	Yes	12 quarters	16:1	415.865.0198; 888.493.3261	www.aicasf.aii.edu	aisfadm@aii.edu

GAME SCHOOL DIRECTORY

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
Art Institute of Charlotte	Charlotte, NC	Graphic Design and Multimedia & Web Design	AAA, Certificate
Art Institute of Colorado	Denver, CO	Media Arts & Animation	BA
Art Institute of Dallas	Dallas, TX	Animation Art & Design, Graphic Design, Multimedia & Web Design, Video Production, Interactive Media Design	AAS, BA
Art Institute of Fort Lauderdale	Fort Lauderdale, FL	Game Art & Design	BS
Art Institute of Houston	Houston, TX	Media Arts and Animation	BFA
Art Institute of Las Vegas	Henderson, NV	Game Art & Design	BS
Art Institutes International Minnesota	Minneapolis, MN	Media Arts & Animation, Multimedia & Web Design, and Visual Effects & Motion Graphics	AS, BS
Art Institute of Philadelphia	Philadelphia, PA	Animation Art & Design, Media Arts	AS, BS
Art Institute of Phoenix	Phoenix, AZ	Game Art & Design, Visual & Game Programming	BA

TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
$353 per credit hour	Yes	Yes	7 quarters (degree); 6 quarters (certificate)	17:1	704.357.8020	www.aich.artinstitutes.edu	aichadm@aii.edu
$382 per credit hour	Yes	Yes	12 quarters	19:1	800.275.2420	www.aic.artinstitutes.edu	aicinfo@aii.edu
$380 per credit hour; $6,336 per quarter	Yes	Yes	7 quarters	Varies	414.692.8080: 800.275.4243	www.aid.artinstitutes.edu	aidadm@aii.edu
$385 per credit hour	Yes	Yes	12 quarters	24:1	954.463.3000; 800.275.7603	www.aifl.artinstitutes.edu	aifladm@aii.edu
$383 per credit hour	Yes	Yes	12 quarters	18:1	800.275.4244	www.aih.aii.edu	mkrobinson@aii.edu
$69,796 full tuition	Yes	Yes	12 quarters	20:1	800.833.2678	www.ailv.artinstitutes.edu	snoel@aii.edu
$364 per credit hour	Yes	Yes	12 quarters (Bachelor's); 7 quarters (Associate's)	20:1	612.332.3361; 800.777.3643	www.aim.artinstitutes.edu	aimadm@aii.edu
$391 per credit hour	Yes	Yes	2 years (AS); 3 years (BS)	19:1	800.275.2474	www.aiph.aii.edu	aiphadm@aii.edu
$68,734 full tuition inc. fees	Yes	Yes	3 years	20:1	602.678.4300; 800.474.2479	www.aipx.artinstitutes.edu	aipxadmin@aii.edu

GAME SCHOOL DIRECTORY

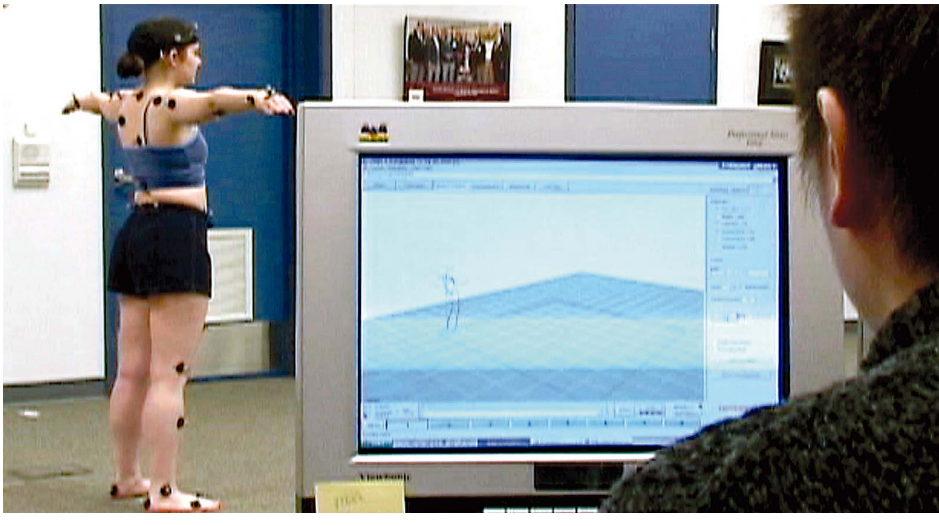
NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
Art Institute of Pittsburgh	Pittsburgh, PA	Game Art & Design	BS
Art Institute of Portland	Portland, OR	Game Art & Design, Visual & Game Programming	BS
Art Institute of Seattle	Seattle, WA	Multimedia & Web Design, Animation Art & Design, Media Arts & Animation	AAA, BFA
Art Institute of Vancouver	Vancouver, British Columbia	Game Art & Design, Visual & Game Programming	Diploma
Art Institute of Washington	Arlington, VA	Game Art & Design, Visual & Game Programming, Interactive Media Design, Media Arts & Animation, Digital Media Production	AA, BA, BFA
Art Institute Online	Pittsburgh, PA	Game Art & Design, Interactive Media Design, Media Arts & Animation, Digital Media Production	AS, BS, Diploma
Austin Community College	Austin, TX	Game Development with Specialization in Programming, Art, Design, Production	Certificate
Banff New Media Institute	Banff, Alberta	Audio Production & Engineering, Creative Electronic Environment, Multimedia, Artificial Intelligence	Associate's
Brown University	Providence, RI	Computer Science	ScM and PhD
California Institute of the Arts	Valencia, CA	Character Animation, Experimental Animation	BFA, MFA

Seneca College of Applied Art and Technology, Animation Arts Centre

The Art Institute of California-San Francisco

TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
$383 per credit hour	Yes	Yes	12 quarters	20:1	412.263.6600; 800.275.2470	www.aip.artinstitutes.edu	aipadm@aii.edu
$377 per credit hour	Yes	Yes	12 quarters	Varies	888.228.6528	www.aipd.artinstitutes.edu	mschotland@aii.edu
$380 per credit hour	Yes	Yes	12 quarters (BFA); 8 quarters (AAA)	19:1	206.448.0900; 800.275.2471	www.ais.artinstitutes.edu	aisadm@aii.edu
Varies	Yes	Yes	6 quarters	20:1	604.298.5400; 800.661.1885	www.aiv.aii.edu	aivbinfo@aii.edu
$375 per credit hour	Yes	Yes	18 months (AA); 36 months (BA, BFA)	20:1	703.358.9550; 877.303.3771	www.aiw.artinstitute.edu	aiw_adm@aii.edu
$1,249 total tuition per course	Yes	Yes	180 credits	N/A	877.872.8869	www.aionline.edu	aioadm@aii.edu
Varies	Yes	Yes	12 courses	8:1	512.223.7662	www.austincc.edu/techcert/Video_Games	rmcgoldr@austincc.edu
$175 per week or more	Yes	No	Short- and long-term residences (days/weeks/months)	Varies	800.565.9989	www.banffcentre.ca	arts_info@banffcentre.ca
$30,672 per year	Yes	Yes	Varies	Varies	401.863.7600	www.cs.brown.edu	gradinfo@cs.brown.edu
$23,920 per year	Yes	Yes	4 years (BFA); 3 years (MFA)	7:1	661.255.1050	www.calarts.edu	admiss@calarts.edu

Platt College, San Diego School of Design



Motion capture at the Vancouver Film School

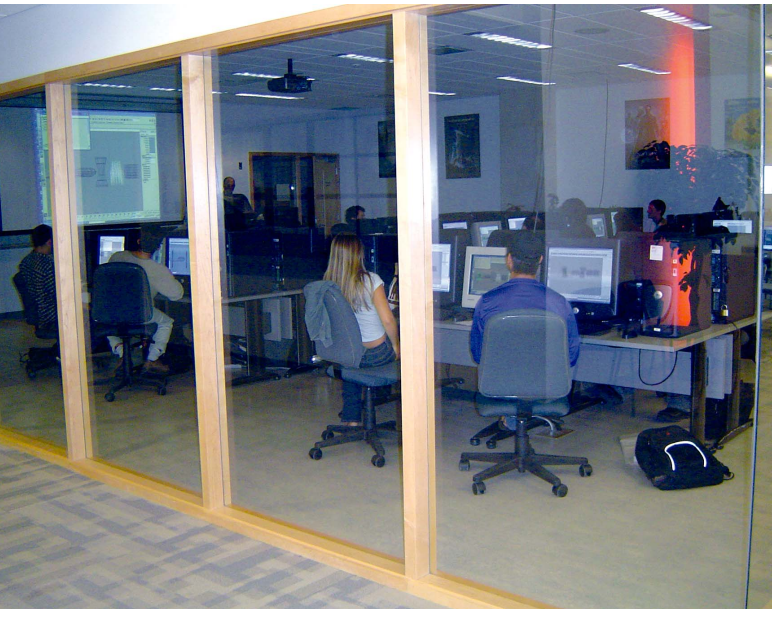
GAME SCHOOL DIRECTORY

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
California Polytechnic State University	San Luis Obispo, CA	Computer Science, Computer Engineering, Art & Design, Graphic Communication, Music	Bachelor's, Master's
California State University, Fullerton	Fullerton, CA	Entertainment Art/Animation	BFA
California State University, Long Beach (University College & Extension Services)	Long Beach, CA	3DS Max Online	Certificate
Carnegie Mellon University	Pittsburgh, PA	Entertainment Technology	MA
CATO (Center for Arts & Technology in Okanagan)	Kelowna, British Columbia	Mobile Game Developer, Animation & Visual Effects	Diploma
Centennial College, The Centre for Creative Communications	Toronto, Ontario	Digital Animation	Certificate
Center for Arts & Technology Atlantic, Canada	Fredericton, New Brunswick	Animation Visual Effects Artist Foundation/Production, Virtual Environment Interactive Design, Recording Arts, Mobile Game Developer	Certificate, Diploma
Center for Digital Imaging Arts at Boston University	Waltham, MA	3D Animation, Visual Effects, Game Art & Design	Certificate
Center for Electronic Communication at Florida Atlantic University	Ft. Lauderdale, FL	Computer Arts in Animation, Computer Arts	BFA, MFA

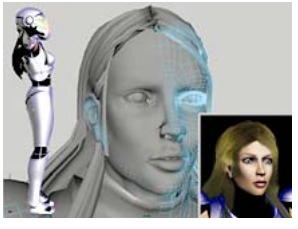
TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
$226 per quarter unit; $3,972 university fees (N)	Yes	Yes	4 years (U); 2 years (G)	19:1	805.756.2311	www.calpoly.edu	admissions@calpoly.edu
$1,258 per semester (U); $1,363 per semester (G)	Yes	Yes	4-5 years	24:1	714.278.3471	www.art.fullerton.edu	kbell@fullerton.edu
$1,295	Affiliate	No	40 hours	Varies	800.963.2250	www.uces.csulb.edu	info@uces.csulb.edu
$19,945–$20,759 per semester	Yes	No	2 years	5:1	412.268.5791	www.etc.cmu.edu	etc-info@andrew.cmu.edu
Approx. $7,000 CDN	No	Yes	51 weeks	12:1	250.860.2787	www.digitalartschool.com	gmorris@digialartschool.com
$15,000 CDN for two semesters; $15,000 US (I)	Yes	No	30 weeks	15:1	416.289.5000 ext. 8637	www.bccc.com	knoble@centennialcollege.ca
$24,960 per year	No	Yes	9-24 months	24:1	506.460.1280	www.digitalartsschool.com	cara@digitalartsschool.com
$18,600	Yes	Yes	9 months	12:1	800.808.CDIA	www.cdiabu.com	info@cdiabu.com
$92.88 (U, R); $410.47 (U, N) per credit; $186.56 (G, R); $678.15 (G, N) per credit	Yes	Yes	2-4 years	8:1	954.762.5618	www.animasters.com	newmand@laureate.cec.fau.edu

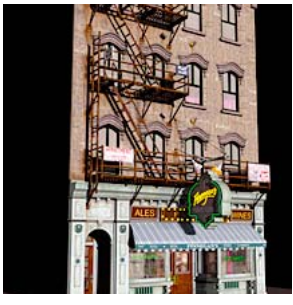
GAME SCHOOL DIRECTORY

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
Centre for Distance Education	Sydney, Nova Scotia	Game Art & Illustration, 3D Character Animation	Diploma
Cerro Coso College Academy of Digital Animation	Ridgecrest, CA	Digital Animation	AS, Certificate
Cogswell Polytechnical College	Sunnyvale, CA	Computer & Video Imaging, Digital Motion Picture, Digital Audio Technology, Digital Arts Engineering, Electrical Engineering, Software Engineering	BA, BS
Collins College	Tempe, AZ	Game Design, Animation	BA
Community College of Baltimore County	Baltimore, MD	Simulation & Digital Entertainment	Associate's
DePaul University's School of CTI	Chicago, IL	Computer Graphics & Animation	BS, MS
DeVry University-Arizona	Phoenix, AZ	Game and Simulation Programming	BS
DeVry University-California	Fremont, CA	Game and Simulation Programming	BS
DeVry University-Georgia	Decatur; Alpharetta, GA	Game and Simulation Programming	BS
DH Institute of Media Arts	Los Angeles, CA	Autodesk/Discreet Certification	Certificate



Classroom at Seneca College of Applied Art and Technology, Animation Arts Centre





Student work from the Center for Digital Imaging Arts at Boston University

Shawnee State University

TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
$7,900–$11,900	No	No	52–64 weeks	N/A	902.564.1680; 866.446.5898	www.cd-ed.com	lcormier@ibacopr.ca
$54 (R); $501 (N) per course	Yes	Yes	1 year	8:1	760.384.6317	www.coyote3d.com	jkiggens@cerrocoso.edu
$570 per unit; $1,710 per 3-unit class; $6,840 per full-time trimester	Yes	Yes	3-4 years	12:1	800.264.7955	www.cogswell.edu	info@cogswell.edu
$6,200 per term	Yes	Yes	31 months	30:1	800.876.7070	www.collinscollege.edu	info@collinscollege.edu
$87 per credit (R)	Yes	Yes	2 years, with expected matriculation to U. Baltimore	20:1	410.455.4598	www.ccbcmd.edu/sait; http://iat.ubalt.edu	hrummel@ccbcmd.edu; smoulthrop@ubalt.edu
$348 per credit (U); $535 per credit (G)	Yes	Yes	4 years (U)	10:1	312.362.8381	www.depaul.edu	cti@cs.depaul.edu
$640 per credit	Yes	Yes	8 terms	25:1	602.870.9201	www.devry.edu/PRinfo	gameinfo@devry.com
$640 per credit	Yes	Yes	8 terms	25:1	888.201.9941	www.devry.edu/PRinfo	gameinfo@devry.com
$640 per credit	Yes	Yes	8 terms	25:1	404.292.2645; 770.664.9520	www.devry.edu/PRinfo	gameinfo@devry.com
$950–$10,250	Pending	No	Varies	Varies	310.899.9377	www.dhima.com	info@dhima.com

Animation Art and Design at the Art Institute of Seattle

The Digital Media Center at the Savannah College of Art and Design

Student work from the Academy of Art-San Francisco

Demo Reels: Resumes in Motion

FOR ARTISTS AND DESIGNERS, THE DEMO REEL IS as important as a resume. A resume talks about a developer's experience, but the reel shows it. Both presentation—how studios see your work—and content—what studios see—are critical.

The medium. The presentation of your reel can take many forms. Some game companies want artists to show their work on a web site and send the URL along with the cover letter and resume. Most will also want to see a high-resolution demo on CD-ROM, as the resolution and speed of a web site is often insufficient to show really fine detail; many art directors viewing demos are seeking a candidate with the chops to do movie-quality work. You may be asked to present your reel on VHS tape or DVD, as they do not require a particular operating system or installed software to run.

Cover your bases by having a demo reel ready both on the web and on CD-ROM. There are also many video transfer services that can put a demo reel file onto VHS tape or DVD. Having a good reel file ready in multiple file formats (Quicktime, Real, and Windows Media, for instance) is a good idea. You can present it on any media on short notice and prospective employers can view whatever file format they need with ease. The clearer and more easily used your CD is, the better your results.

Only the best. The demo should be 2–5 minutes long, and it should begin with your absolute best work, to keep the watcher watching. Your demo reel is one of many hundreds that your intended audience will play, and only demos that are original and show incredible skill and talent will be viewed to the end.

Substance over style will get you hired. The strongest reels show a variety of genres and styles, illustrating your well-rounded talents. Animations should show unique moves and organic life forms. If your strengths are in modeling, show your unique models, textured and lit. Strong texture artists should present a variety of textures and their uses. An environment artist would want to have a great fly-through of various environments. Portraying different art styles is paramount. Save 2D art and stills for the end of your reel, but show your strongest work there as well, including life drawings or pencil sketches. Let your reel emphasize that you can do whatever the job needs you to do.

Engineers should supply sample code and/or working game pieces as part of their submission. Show well-organized and well-documented code, being careful not to submit code from a project that is copyrighted by another company. You should always ask before sending over a code sample, as some companies are very careful about what they receive. Present your samples on CD, following the guidelines above, for a professional presentation.

Many game companies have very detailed descriptions of, or advice about, what they would like to see in a candidate's demo. Be ready to submit specific pieces to a prospective employer to show that you can do the exact thing they want.

Tell the story. Don't take credit for someone else's work. If you use a scene in your demo that includes the work of other artists, designers or programmers, you must make it abundantly clear at the outset that the scene is collaborative and fully describe your contribution. There is nothing more frustrating to a hiring manager than to discover too late in the process that the candidate in whom he had interest is not as well-rounded as his demo has portrayed. Have some samples of your work flow–showing the steps you took to get from concept drawing to fully executed finished piece can be very impressive.

All of these tools and tips apply equally to demos for game and level design. Show your levels in a movie file, as well as in the editor. Talk about which editor you used to build your level and why. Give credit to the builders of your models, textures and characters if you did not create them all from scratch. While a level designer is not always required to have the same artistic skill as a qualified game artist, they should still endeavor to show their artistic prowess alongside their writing abilities. The game level designer is a Jack- or Jill-of-all-trades, using art, writing, organizational, and technical skills, so building a great graphical demo reel to complement your resume and writing samples will only strengthen your position.

—Robin McShaffry, Mary-Margaret.com

For more advice on entering the industry, see "So You Want to be a Game Programmer," page 38.

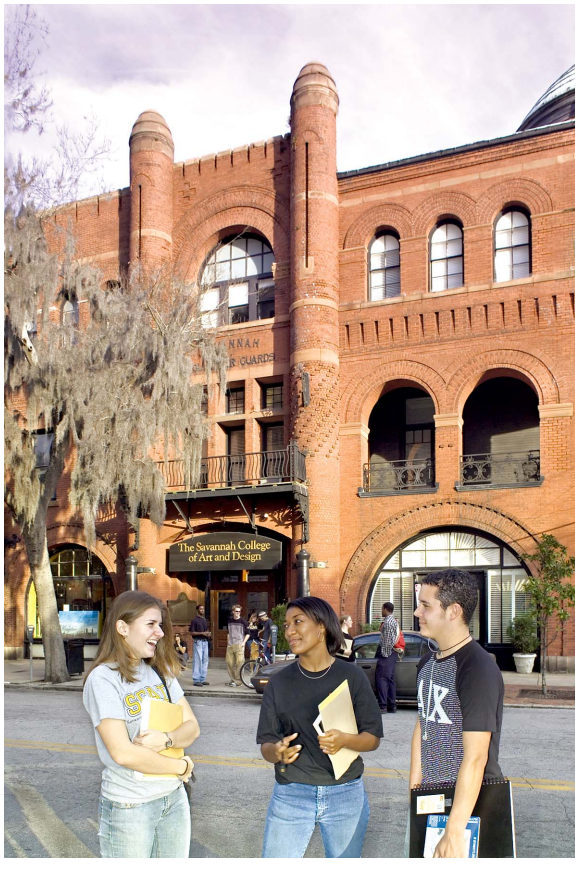
GAME SCHOOL DIRECTORY

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
DigiPen Institute of Technology	Redmond, WA	Real-Time Interactive Simulation, Computer Engineering, Computer Science, 3D Computer Animation, Production Animation	Associate's, Bachelor's, and Master's
Digital Design, Fine Arts at Grande Prairie Regional College (GPRC)	Grande Prairie, Alta.	Visual Arts, Interactive Digital Design, Computer Systems Technology, Computing & Information Systems	Diploma, BS
Drexel University, College of Media Arts & Design	Philadelphia, PA	Digital Media, Film & Video, Graphic Design, Photography, Screenwriting & Playwriting, Music Industry	BS
Edmonds Community College	Lynnwood, WA	Game Development	AA, AS, Certificate
Ex'pression College for Digital Arts	Emeryville, CA	Digital Art, Animation, Interactive Game Audio, Modeling, Game Production, Motion Studies	BA
Florida Interactive Entertainment Academy	Orlando, FL	3D Modeling, Animation, Technical Artistry, Software Development, Production Management	Certificate, MS
Full Sail Real World Education	Winter Park, FL	Game Design & Development, Computer Animation, Digital Arts & Design	BS
Game Institute, Inc.	New York, NY	Game Engine, 3D Graphics Development	Certificate, can be applied toward AS and BS through Excelsior College
Gemini School of Visual Arts and Communication	Cedar Park, TX	Visual Arts & Communication	Diploma

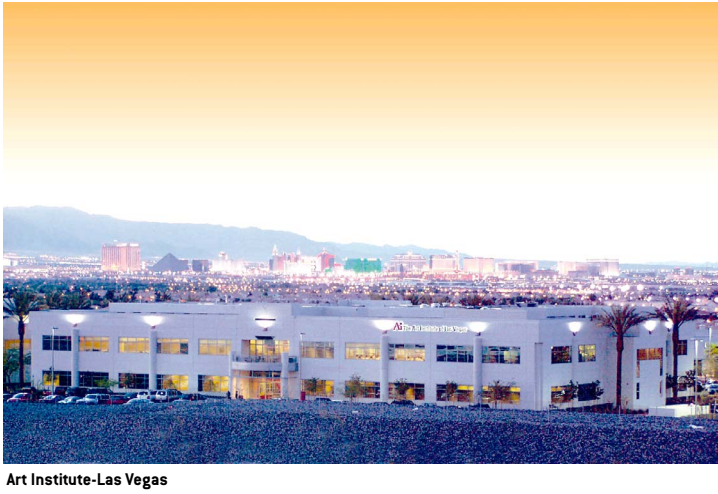
TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
$345 (U); $450.00 (U, I); $500 (G); $650.00 (G, I) per credit	Yes	Yes	1–4 years	15:1	425.558.0299	www.digipen.edu	info@digipen.edu
$270 per 3-credit course	Yes	Yes	2 years (diploma program); 120 credits (degree program)	10:1	780.539.2911	www.gprc.ab.ca	finearts@gprc.ab.ca; cmss@gprc.ab.ca
$28,300 (full tuition)	Yes	Yes	4 years	15:1	215.895.1675; 215.895.1834	www.drexel.edu/comad	ddm22@drexel.edu; tjm22@drexel.edu
$900 per quarter	Yes	Yes	1-2 years	15:1	425.640.1902	www.edcc.edu	gamedev@edcc.edu
$54,450 (4 academic year program)	Yes	Yes, limited	31 months	12:1	877.833.8800	www.expression.edu	yee-ju@expression.edu
$29,500 (full tuition)	Yes	Yes	16 months	4:1	407.823.2121	www.fiea.ucf.edu	admission@fiea.ucf.edu
$58,775 (full degree program cost, including books and supplies)	Yes	Yes	21 months	6–12:1	407.679.6333; 800.226.7625	www.fullsail.com	admissions@fullsail.com
$200 per course	Yes	Yes, limited	7 semesters, or per-course	15:1	N/A	www.gameinstitute.com	information@gameinstitute.com
$55,600 for 4-year course	No	No	4 years	8–12:1	512.249.1237	www.geminischool.com	info@geminischool.com

GAME SCHOOL DIRECTORY

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
Georgia Institute of Technology	Atlanta, GA	Graphics & Visualization, Artificial Intelligence	BS, MS, PhD
Georgia State University	Atlanta, GA	Computer Science, Artificial Intelligence	BS, MS, PhD
Gnomon School of Visual Effects	Hollywood, CA	High-End 3D Computer Graphics	Certificate
Guildhall at Southern Methodist University	Dallas, TX	Digital Game Development	Certificate
Illinois Institute of Art, Chicago	Chicago, IL	Game Art & Design, Media Arts & Animation, Digital Media Production, Visual Effects & Motion Graphics	BFA
Illinois Institute of Art, Schaumburg	Schaumburg, IL	Digital Media Production, Game Art & Design, Media Arts & Animation, Visual Communications; Digital Graphic Design, 3D Animation Principles & Techniques	Certificate, BFA
Indiana University-MIME Program	Bloomington, IN	Master's in Immersive Mediated Environments (MIME)	Master's
Marist College	Poughkeepsie, NY	Computer and Video Game Developer Certificate program	Certificate, Bachelor's, Master's
Massachusetts Institute of Technology	Cambridge, MA	MIT Comparative Media Studies	BS, MS
Mercy College, Center for Digital Arts	White Plains, NY	Game Design, Digital Media and Interaction Design, Animation	BFA



Savannah College of Art and Design



Art Institute-Las Vegas

TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
$11,475 per year (N)	Yes	Yes	4 years	11:1	404.894.3152	www.gatech.edu	admissions@success.gatech.edu
$8,478 per year (N)	Yes	Yes	4 years	15:1	404.651.2365	www.gsu.edu	admissions@gsu.edu
$43,225 (certificate program); Extension courses vary from $225–$1,700	No	No	21 months	12:1	323.466.6663	www.gnomon3d.com	info@gnomon3d.com
$3,000–$9,000 per term sliding scale (incl. equipment)	Yes	Yes	1 1/2 years	8:1	214.768.9950	http://guildhall.smu.edu	guildhall@smu.edu
$380 per credit; $22,800 per year	Yes	Yes	12 quarters	15:1	312.280.3500; 800.351.3450	www.ilic.aii.edu	hernanle@aii.edu
$380 per credit; $22,800 per year	Yes	Yes	3 years (Bachelor's)	20:1	800.314.3450; 847.619.3450	www.ilis.artinstitutes.edu	via web site
$143–$573 per credit; $821 per year	Yes	Yes	4 years	19:1	812.855.3254	www.mime.indiana.edu	inadmit@indiana.edu
$445 per credit hour (U); $562 per credit hour (G)	Yes	Yes	16–34 weeks	Varies	845.575.3800	www.marist.edu/gce/gaming	continuing.ed@marist.edu
$30,800 per year or more	Yes	Yes	4 years (U); 2 years (G)	5:1	617.253.3599	http://web.mit.edu/cms	cms@mit.edu
$5,896 per semester; $496 per credit	Yes	Yes	4 years	10:1	877.MERCY.GO; 914.948.3666	www.mercy.edu/cda	computerarts@mercy.edu

The Interactive Media Lab at the University of Southern California

GAME SCHOOL DIRECTORY

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
Mesmer Animation Labs	Seattle, WA	Maya, Softimage XSI	Certificate of completion
Michigan State University (Department of Telecommunication)	East Lansing, MI	Game Design and Development, Digital Media Art & Technology	BA, BS, BFA, MA
Multimedia and Digital Comm.- Northern Oklahoma College	Tonkawa, OK	3D Animation and Post-production	AAS
National Animation and Design Centre (NAD Centre)	Montreal, Quebec	Design and 3D Animation for Video Games	Diploma
New Media Campus	Saskatoon; Regina, Saskatchewan	Multimedia Professional Studies, 3D Animation & Game Design Studies	Diploma
New York University, The Center for Design, Digital Arts, and Film	New York, NY	Digital Imaging & Design	Certificate, MS
Northwestern University Computer Science Dept.	Evanston, IL	Computer Science	MS, PhD
Otis College of Art and Design, Digital Media Department	Los Angeles, CA	Digital Media	BFA
Palomar College	San Marcos, CA	Video Game Specialist Certificate (programming), Video Game Artist Certificate	AA, Certificate

TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
$7,535–$8,950	No	Yes	11 weeks	6:1	800.237.7311	www.mesmer.com	info@mesmer.com
$15,144 (U, R); $25,934 (U. N); $27,042 (U, I); $17,814 (G, R); $23,720 (G, N); $23,672 (G, I)	Yes	Yes	2 years	20:1	517.355.8372	http://dmat.msu.edu	rachel@msu.edu
$7,440 for 2 year session	Yes	Yes	2 years	5:1	580.628.6458	www.north-ok.edu/dmi	bmatson@north-ok.edu
$16,500 CDN; $21,500 CDN (I)	No	Yes	48 weeks; 12-16 week full-time internship	20 students per program	514.288.3447	www.nadcentre.com	info@nadcentre.com
$12,000 per year	No	Yes	9–10 months	20:1	306.721.1460	www.newmediacampus.com	info@newmediacampus.com
$10,000 per semester; $1,000 per credit	Yes	Yes	2 years	13:1	212.998.7200	www.scps.nyu.edu/digital	cada@nyu.edu
$10,548 per quarter	Yes	Yes	2–4 years	7:1	847.491.3500	www.northwestern.edu	c-riesbeck@northwestern.edu
$11,410 per semester	Yes	Yes	4 years	15:1	310.665.6987	www.otis.edu	hmott@otis.edu
$11 per unit (R); $145 per unit (N); $157 per unit (I)	Yes	Yes, limited	1 year	15–30:1	760.744.1150 ext. 5410	www.palomar.edu	palomarInfo@edmagnin.com

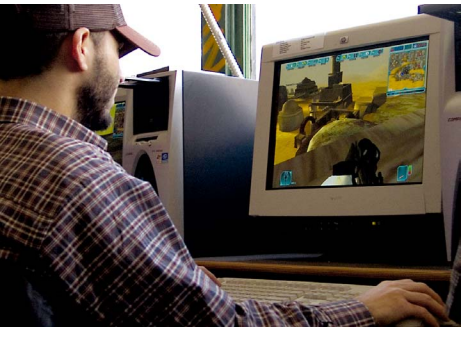
GAME SCHOOL DIRECTORY

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
Parsons School of Design, Design and Technology Department	New York, NY	Game Design & Technology	BFA, MFA
Platt College, San Diego School of Design	San Diego, CA	Media Arts, Graphic Design, Multimedia Design	AAS, BS, Diploma
Pratt Institute	Brooklyn; New York, NY	Computer Graphics & Interactive Media, Digital Design & Interactive Media	BFA, MFA
Purdue University and Technical Animation	West Lafayette, IN	Computer Graphics Technology, Concentrations in Interactive Multimedia	AS, BS
Replica 3D Animation School	Courtenay, British Columbia	Computer Animation	Certificate
Ringling School of Art and Design	Sarasota, FL	Computer Animation, Fine Arts, Graphic & Interactive Communication, Illustration, Photography, Digital Imaging	BFA
Rochester Institute of Technology	Rochester, NY	Concentration in Game Programming	Certificate, MS
San Francisco State University	San Francisco, CA	Introduction to Computer Science via Game Design	BS, MS
Santa Monica College, Academy of Entertainment & Technology	Santa Monica, CA	Animation, Game Development, Post Production, Visual Effects, Web Design	AA, Certificate
Savannah College of Art and Design	Savannah, GA	Animation, Interactive Design, Game Development and Visual Effects	BFA, MA, MFA

Workstation at Platt College at the San Diego School of Design

Student work at the Art Institute-San Francisco

TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
$28,000 per year	Yes	Yes	2–4 years	15:1	212.229.8908	http://dt.parsons.edu	dt@parsons.edu
$11,880–$44,640	Yes	Yes	30–117 weeks	18:1	866.752.8826	www.platt.edu	info@platt.edu
$26,500 (U); $17,100 (G)	Yes	Yes	4 years (BFA); 2 years (MFA)	6:1	718.636.3514; 800.331.0834	www.pratt.edu	rick@pratt.edu
$14,400 (R); $24,770 per year (N)	Yes	Yes	4 years	16:1	765.494.7505	www.tech.purdue.edu/cg	cgtinfo@purdue.edu
$12,555 full tuition	N/A	Yes	38 weeks	4:1	250.338.8784	www.replica3d.ca	info@replica3d.ca
$10,600 per semester	Yes	Yes	4 years	16:1	941.351.5100	www.ringling.edu	admissions@ringling.edu
$713 per credit part-time; $8,464 per quarter full-time	Yes	Yes	1 course/quarter for 1 academic year	30:1	585.475.6179	www.it.rit.edu	itugrad@it.rit.edu (U); itgradcoord@it.rit.edu (G)
$1,564/semester (R)	Yes	Yes, limited	4 years	16–30:1	415.338.1008	http://cs.sfsu.edu	cs@sfsu.edu
$26 per unit (R); $149–$171 (N, I)	Yes	Yes	2 years	8:1	310.434.3700	http://academy.smc.edu	academy_info@smc.edu
$21,600 (U); $22,050 (G)	Yes	Yes	180 hours (BFA); 45 hours (MA); 90 hours (MFA)	20:1	912.525.5100; 800.869.7223	www.scad.edu	admission@scad.edu



Classroom setting at the Vancouver Film School

Art Institute of Seattle

GAME SCHOOL DIRECTORY

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
School of Communication Arts	Raleigh, NC	Digital Media, Digital Animation, Digital Filmmaking & Digital Audio	Certificate
School of Visual Arts	New York, NY	Computer Art, Animation	BFA
Seattle Central Community College	Seattle, WA	Game Design	Certificate
Seneca College of Applied Art and Technology, Animation Arts Centre	Toronto, Ontario	Video Game Art & Design	Certificate
Shawnee State University	Portsmouth, OH	Game & Simulation Development Arts, Simulation & Game Engineering Technology	BFA, BS
Sierra Nevada College	Incline Village, NV	Entertainment Technology, Digital Art, Computer Science	BA, BFA, BS, MA
Success College of Applied Arts & Technology	Moncton, New Brunswick	Digital Graphic Design, Interactive Entertainment Technology	Diploma
University of Advancing Technology	Tempe, AZ	Game Design, Multimedia & Game Programming, Software Engineering	Associate's, Bachelor's, Master's
University of Calgary, Department of Computer Science	Calgary, Alberta	Computer Science with a Concentration in Game Design	BA, BS, MS, PhD

TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
$280–$369 per credit	Yes	Yes	2 years	6:1	919.488.8500; 800.288.7442	www.higherdigital.com	school@higherdigital.com
$11,200 per semester	Yes	Yes	4 years	9:1	212.592.2100; 800.436.4204	www.schoolofvisualarts.edu	admissions@sva.edu
$395 per course	Yes	No	Approx. 1 quarter	6:1	206.587.5448	www.learnatcentral.org	jewest@sccd.ctc.edu
$8,510; $12 386 (I)	Yes	Yes	8 months	Varies	416.491.5050 ext. 3850	http://aac.senecac.on.ca	aac@senecac.on.ca
$5,207 per year (U, R)	Yes	Yes	4 years	12:1	800.959.2778	www.shawnee.edu	To_SSU@shawnee.edu
$19,500 per year	Yes	Yes	4 years	8:1	775.831.1314 ext. 4046	www.sierranevada.edu	admission@sierranevada.edu; dart@sierranevada.edu
$5,950 CDN per year	Yes	Yes	2 years	25:1	506.855.8555	www.thinksuccess.ca	moncton@thinksuccess.ca
$349 per credit	Yes	Yes	60 credit hours (Associate's); 120 credit hours (Bachelor's)	15:1	602.383.8228; 800.658.5744	www.uat.edu	admissions@uat.edu
$2,350 per semester	Yes	Yes	Min. 4 years	15:1	403.220.6015	www.cs.ucalgary.ca	discover@cpsc.ucalgary.ca

GAME SCHOOL DIRECTORY

NAME	LOCATION	PROGRAMS OFFERED	DEGREES/CERTIFICATION
University of California, Irvine	Irvine, CA	Specialization in Game Culture and Technology, Computer Engineering, Information and Computer Science, Digital Arts	BA
University of California, Los Angeles (Extension)	Los Angeles, CA	Computer Graphics & Graphic Design	Certificate
University of Maryland, Baltimore County (Computer Certification Training Center)	Baltimore, MD	Computer Game Development Fundamentals/Effects & Animation Advanced	Non-degree training program
University of Michigan (EECS Department)	Ann Arbor, MI	Computer Science, Computer Engineering	Bachelor's, Master's, Doctoral
University of Missouri–Columbia (College of Engineering)	Columbia, MO	Computer Science-Information Technology	BS, MS, PhD
University of Pennsylvania	Philadelphia, PA	Computer Graphics & Game Technology, Digital Media and Design, Human Modeling and Simulation	BS, MS, PhD
Univ. of Southern California, School of Cinema-Television, Interactive Media	Los Angeles, CA	Interactive Entertainment, Interactive Media (includes EA Interactive Entertainment Track), Video Game Design and Management	B.A., M.F.A., minor
University of Texas at Dallas, Institute for Interactive Arts & Engineering	Dallas, TX	Arts & Technology	BA, MA, MFA
University of Washington Educational Outreach	Seattle, WA	Game Development, Game Animation	Certificate
University of Waterloo	Waterloo, Ontario	Computer Science and Computer Engineering	BS, PhD
Vancouver Film School	Vancouver, BC	Game Design, 3D Animation & Visual Effects, Digital Character Animation	Diploma
Vancouver Institute of Media Arts	Vancouver, BC	Game Art & Design, 3D Computer Animation, Visual Effects	Diploma, Certificate

DYADIN, **a student project at the University of Southern California Interactive Media program**

Workstation at Platt College

TUITION	ACCREDITED	FINANCIAL AID	LENGTH OF PROGRAM	STUDENT/FACULTY RATIO	PHONE	URL	CONTACT
Standard UC tuition costs apply	Yes	Yes	2–4 years	20:1	949.824.6703	http://ucgamelab.net	via web site
$475–$855 per course	Yes	Yes	2 years	15:1	310.206.1422	www.uclaextension.edu/visualarts	visualarts@uclaextension.org
$1,295–$2,495	Affiliate	Yes	84 hours (fundamentals); 42 hours (advanced program)	10–19:1	410.594.2282	www.umbc.edu/trainctr	info@umbccctc.com
$9,244 (R); $27,856 (N)	Yes	Yes	4 years	15:1	734.764.2390	www.eecs.umich.edu	ugadmiss@umich.edu
$6,042 (G, R); $8,330 (G, N) per year	Yes	Yes	4 years (BS); 2 years (MS)	13:1	573.882.6666	www.engineering.missouri.edu	gradsec@cs.Missouri.edu
$30,716 (U) per year; $3,899 (G) per course	Yes	Yes	1–4 years	6:1	215.898.8560	www.cis.upenn.edu/grad/cggt	cggt@cis.upenn.edu
$1,074 (G) per unit; $14,994.00 (U) per semester	Yes	Yes	4 years (BA); 3 years (MFA)	4:1	213.821.2515	http://interactive.usc.edu	usc_interactive@cinema.usc.edu
$3,230 (R); $5,700 (N, G) for 12 units	Yes	Yes	4 years (U); 1 year (MA); 2 years (MFA)	33:1	972.883.4379	http://iiae.utdallas.edu	Thomas.linehan@utdallas.edu
$639 per course (development); $619 per course (animation)	Yes	No	9–12 months	25:1	800.543.2320	www.extension.washington.edu	requests@ese.washington.edu
$13,770–$16,020 CDN per year	Yes	Yes	4 years	19:1	519.888.4567	www.cs.uwaterloo.ca	cs-chair@cs.waterloo.ca
$16,750 CDN; $41,750 CDN (N)	Yes	Yes	12 months	6:1	604.685.5808; 800.661.4101	www.vfs.com	admissions@vfs.com
$20,900	Yes	Yes	48 weeks	10:1	604.682.2787; 800.396.2787	www.vanarts.com	info@vanarts.com

An internal view of Seneca College

The Illinois Institute of Art

GAME SCHOOL DIRECTORY

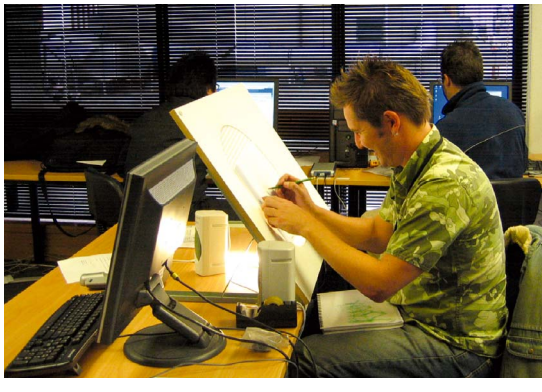
Sampling of International Schools

Student art from the Media Design School in New Zealand

NAME	LOCATION	URL
Academy of Interactive Entertainment	Watson, Australia	www.aie.act.edu.au
Anhembi Morumbi University	Sao Paulo, Brazil	www.anhembi.br
Bournemouth University	Bournemouth, England	www.bournemouth.ac.uk
Chalmers Medialab	Gothenburg, Sweden	www.ckk.chalmers.se
Charles Sturt University	Bathurst, NSW, Australia	www.csu.edu.au
Computing Science at Middlesex University	Enfield, England	www.cs.mdx.ac.uk
Games Academy	Berlin, Germany	www.games-academy.com
Glasgow Caledonian University	Glasgow, Scotland	www.gcal.ac.uk
HKU Utrecht School of the Arts	Hilversum, Holland	http://english.hku.nl/hku/show
Hong Kong Polytechnic University	Hong Kong	www.polyu.edu.hk
International Center for Digital Content	Liverpool, England	www.icdc.org.uk
IT University of Copenhagen	Copenhagen, Denmark	www.itu.dk/mtg
Kent Institute of Art & Design	Canterbury, England	www.kiad.ac.uk
Leeds Metropolitan University	Leeds, England	www.lmu.ac.uk
Liverpool John Moores University	Liverpool, England	www.livjm.ac.uk
Media Design School	Auckland, New Zealand	www.mediadesign.school.nz
Northumbria University	Newcastle, England	http://northumbria.ac.uk
Parsons School of Design	Paris, France	www.parsons-paris.pair.com
Qantm	Brisbane, Australia	www.qantm.com.au
University of Bradford	Bradford, England	www.comp.brad.ac.uk
University of Essex	Colchester, England	www.essex.ac.uk
University of Hull	Hull, England	www.mscgames.com
University of Lincoln	Lincoln, England	www.lincoln.ac.uk
University of Paisley	Paisley, Scotland	www.paisley.ac.uk
University of Portsmouth	Portsmouth, England	www.port.ac.uk
University of Salford	Greater Manchester, England	www.salford.ac.uk
University of Sheffield	Sheffield, England	www.shef.ac.uk
University of Teesside	Tees Valley, England	www.tees.ac.uk

IT University of Copenhagen

University of Portsmouth



Media Design School classroom

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"I've always dreamt of making games, ever since I was a child. After my Bachelor's, I contacted many companies, but I didn't manage to land a job. I decided to enrol on Hull's MSc programme. The course provided a great environment to refine my skills and produce great demos.
After the course, I found a job right away, and now work at Criterion on the next Burnout.
Personally, I don't believe I would have got a job in the industry if it hadn't been for my experiences in Hull."

Yacine Salmi. MSc Graduate 2004
Originally from Morocco Yacine grew up in the US and did his undergraduate degree in Canada.
He enrolled on the MSc in 2004 and was offered a next generation programming job before he had finished the course.

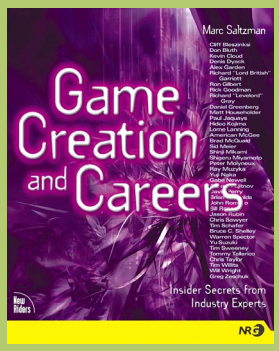
"I honestly advise anybody who wants to get into the games industry to take the MSc in Games programming at Hull University. The experience acquired in the MSc was vital for the development of my career. If you are not afraid of working insane hours and want to change your life apply for this MSc, you will not regret it."
Francisco Viciana MSc Graduate 2003.

Francisco did his Bachelor's degree in his native Spain before moving to work in the US. Thanks to his marks in the MSc, Francisco, (Paco), was offered jobs at some of the most prestigious game developers in UK, including Sony, Criterion and Rare. After working as a rendering programmer for Sony Soho developing for the PSP, he was hired by EA Canada to develop a next generation AAA.
He has recently acted as a reviewer for the third edition of Scott Meyers, Effective C++.

For more quotes from ex-students, examples of student work and syllabus information please visit www.mscgames.com. PhD and BSc study also available.

INDUSTRY AT LARGE

CONTINUED FROM PG 80



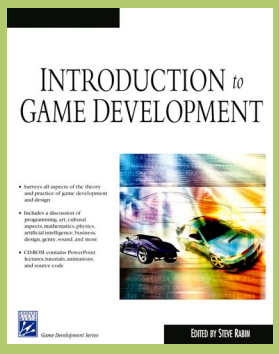
Game Creation and Careers: Insider Secrets From Industry Experts

Editor: Marc Saltzman
Publisher: New Riders Games
Pages: 744
$49.99

IF YOU'RE LOOKING FOR MAXIMUM exposure to the game industry with minimal investment at the bookstore, then this is one title definitely worth purchasing.

Game Creation and Careers is a massive treasury of knowledge, containing articles by more than 100 of the industry's most respected game developers and covering a huge range of topics, from design to finance to engineering. Throw in over 100 pages on breaking into the industry, and you have one of the most comprehensive game development tomes ever assembled.

With each contributing writer discussing a topic on which he or she is a recognized authority, this book puts together the wisdom of the experts into the hands of the aspiring developer. Puzzle design is taught by the creator of ODDWORLD, MMORPGs by the producer of WORLD OF WARCRAFT, artificial intelligence by the makers of THE SIMS. The list is certainly impressive and spans all aspects of the industry.



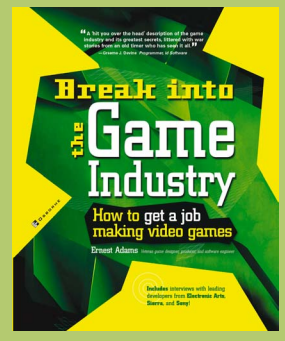
Introduction to Game Development

Editor: Steve Rabin
Publisher: Charles River Media
Pages: 900
$69.95

BASED ON THE IGDA'S CURRICULUM guidelines for game developers, *Introduction to Game Development* is a massive textbook penned by more than two dozen expert developers who cover the fundamental principles underlying each major area of game development. For the serious student looking for a comprehensive, yet in-depth, introduction to the process of making games, this book is the place to start.

Each section focuses on a specific discipline—game design, programming architecture; math and physics programming; computer graphics and animation; audio design; and the business of game development. There's also some interesting discussion on the history and sociology of video games, and a bundled CD-ROM that contains demos, source code, and other material referenced in the book.

You can read a full review of Steve Rabin's book on Gamasutra.com.



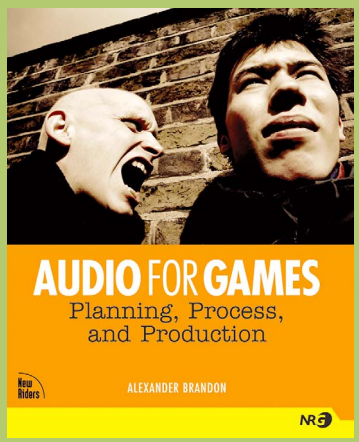
Break Into the Game Industry

Author: Ernest Adams
Publisher: McGraw Hill/Osborne
Pages: 352
$24.99

***BREAK INTO THE GAME INDUSTRY*, BY** game designer Ernest Adams, is a beginner's guide to getting established in the game industry. Aimed at people with little or no experience in game-making, Adams provides a comprehensive overview of game development in the world today, covering the structure of the industry, the process of creating games, and most importantly, the kinds of jobs available and the skills needed to get them.

Job-hunting basics are covered, too: preparing a strong portfolio, applying for the right position, and nailing the interview, all with a focus on how looking for work in the game industry differs from an ordinary job search. Certain educational choices might forward your game development career, so Adams discusses those, alongside a host of additional resources (such as an alphabetized list of more than 100 developers and publishers).

GAME AUDIO



Audio for Games: Planning, Process, and Production

Author: Alexander Brandon
Publisher: New Riders Games
Pages: 240
$34.99

GAME AUDIO IS ONE OF THE MOST EXCITING AND fastest evolving areas of game development, yet surprisingly few authors have explored the field in depth. For a complete overview of both the creative and technical aspects of designing audio for games, check out this book by leading game audio designer and *Game Developer* columnist Alexander Brandon.

Brandon takes the reader through an entire game audio pipeline, examining how audio is created for games and detailing the workflow and technology behind the sound design process. He discusses orchestral scoring, sound effects, interactive audio—every major aspect of audio design—and discusses some of the interesting innovations that promise to revolutionize game audio in the near future.

Game audio is one of the most complex aspects of game development, and given that it's still developing at a very rapid pace, also one of the most rewarding. Anyone with an interest in audio design for games will learn a great deal from this book. Check out the recent book excerpt on Gamasutra.com.

CONTINUED ON PG 76

Penn
University of Pennsylvania

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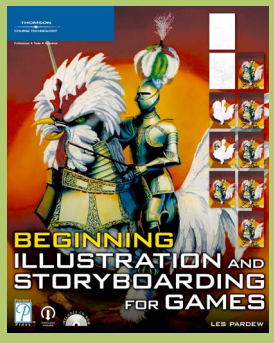
www.cis.upenn.edu/grad/cggt/

VISUAL ARTS

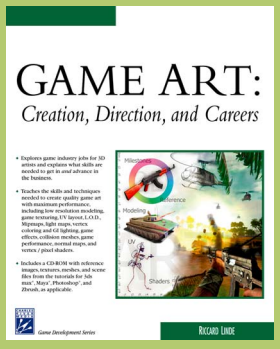
CONTINUED FROM PG 74



Beginning Illustration and Storyboarding for Games
Author: Les Pardew
Publisher: Thomson Course Technology
Pages: 276
$29.99

IN THE GAME INDUSTRY 2D ARTISTS do much of the design work that precedes production, and a superb introduction to their craft can be found in this book from the Thomson Course Technology series. From thumbnailing and storyboarding to designing heroes and villains, *Beginning Illustration and Storyboarding for Games* focuses on improving general design skills and learning techniques specific to the game industry, such as creating game layout charts and producing model sheets that can be used by computer modelers.

The balance between creative skills and design process is Pardew's strength in this title, although the colorful illustrations are pretty neat, too. Combined with the bundled CD-ROM, this book can help you improve your drawing skills and learn about the role of 2D art in a game development pipeline.



Game Art: Creation, Direction, and Careers
Author: Riccard Linde
Publisher: Charles River Media
Pages: 342
$49.95

COMPUTER ANIMATION IS OFTEN considered the most challenging and specialized area of game development. If you're planning to channel your artistic talents into 3D space, then you need a solid technical foundation in computer graphics.

For aspiring computer animators, this book explores the creative and technical foundations of 3D game art, such as polygonal modeling, bump mapping, and a host of more advanced concepts. The book emphasizes the technical basis for the various computer animation disciplines, but addresses creative skills as well.

The book includes a CD-ROM with scene files and sample material that can be used for practice—compatible with Maya, 3D Studio Max, and other popular packages.

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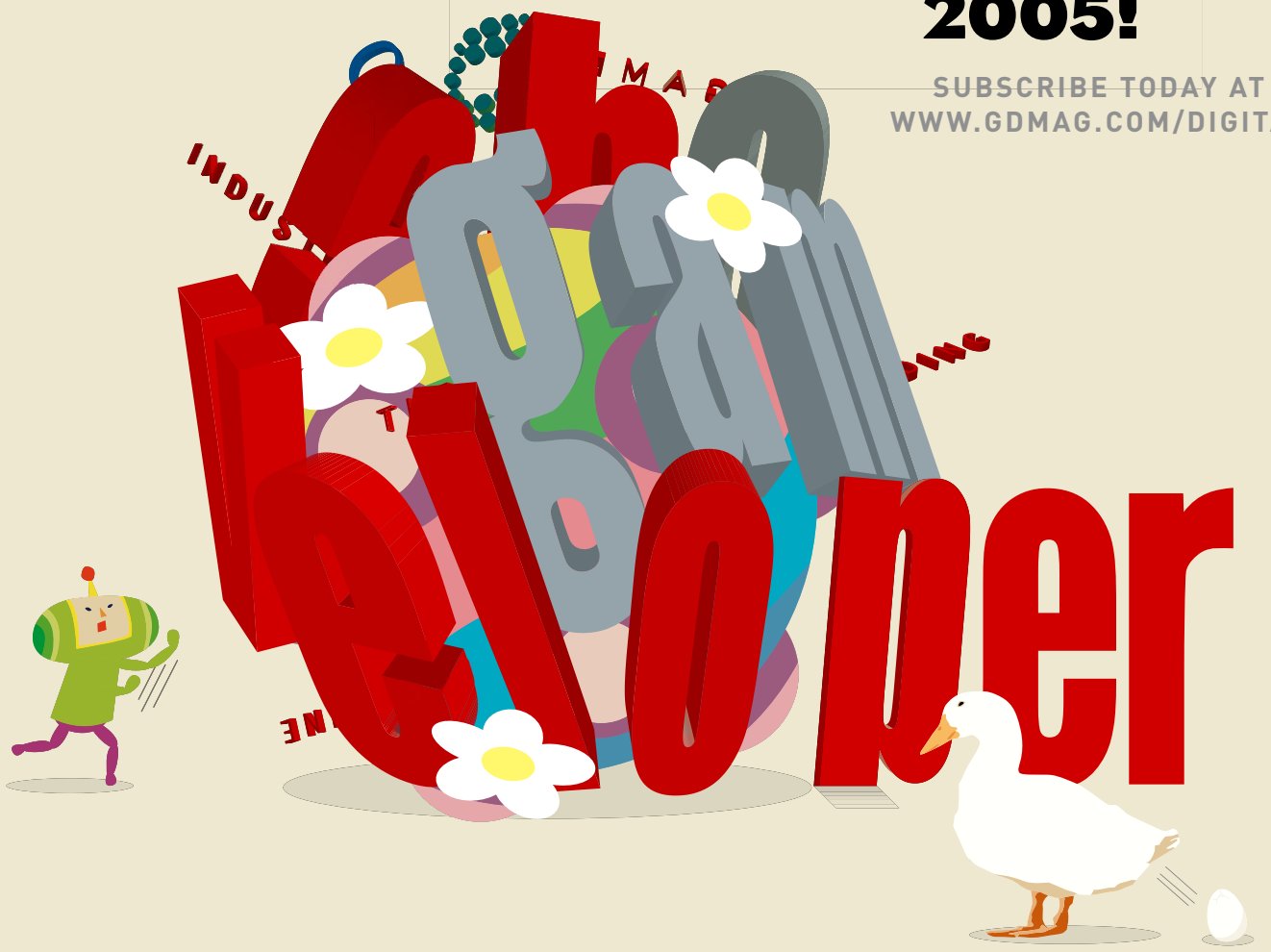


PROGRAMMING

CONTINUED FROM PG 76

Game Programming for Teens

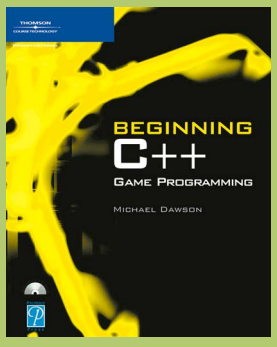
Author: Maneesh Sethi
Publisher: Thomson Course Technology
Pages: 416
$29.99

GAMING HAS COME A LONG WAY SINCE the days of text-based adventure games, yet programming remains the heart of electronic game development. For the aspiring game programmer, *Game Programming for Teens* provides a superb overall introduction.

Written with the assumption that the reader has never programmed before, the newly released second edition of this book explains the basics of computer programming, and teaches—with the help of a simple programming language called BlitzPlus—how to write a computer program, step by step. Over the course of the book, the sample programs grow incrementally more complex, progressing from basic terminology and simple logic loops, to advanced topics such as graphics, sound, and random number generation.

Thankfully, the book is appealing to anyone with an interest in programming—adults and teenagers alike. But having a computer is a must for getting the most out of this title since the bundled CD-ROM includes a programming environment in which you can practice programming as you progress through the book.

In the same series, check out the *Game Design for Teens* book, too.



Beginning C++ Game Programming

Author: Michael Dawson
Publisher: Thomson Course Technology
Pages: 352
$29.99

C++ IS THE LINGUA FRANCA OF PROGRAMMING LANGUAGES. IT'S everywhere. C++ is one of the core skills you'll need as a programmer, and Michael Dawson's book is an easy and enjoyable way to learn the language.

Each section uses a simple, do-it-yourself game—such as HANGMAN or BLACKJACK—to teach the core concepts of C++ programming. You'll create 10 games in all over the course of the book, revolving around key concepts such as functions, classes, pointers, and arrays. This is a great, hands-on way to learn the fundamentals of C++.

The bundled CD-ROM includes a C++ programming environment, all the source code from the book, and everything else you'll need to follow along at home.

ADVERTISER INDEX

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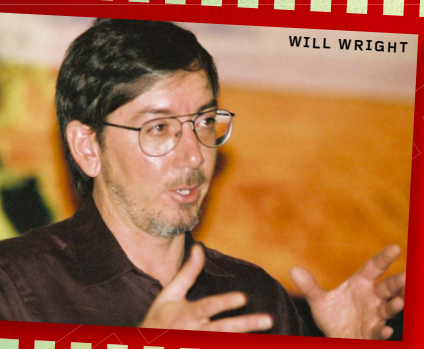

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TOP 10 BOOKS

IF YOU'VE EVER TRIED TO GET A JOB IN THE GAME **INDUSTRY,** then you know that breaking in can be the toughest game of them all.

Game development has become a mega-industry, head-to-head with Hollywood, and a important creator of digital entertainment. Jobs in the game industry span all frequencies of the employment spectrum, from programmers, artists, designers, and producers, to production personnel, marketers, lawyers, and business types.

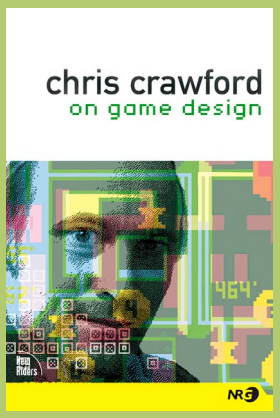
The most coveted game development jobs—designer, programmer, and artist—are of course the hardest ones to land. Yet thousands of people break into this industry every year, and with a little focus, a touch of luck, and a push in the right direction, you can get a job in gaming, too.

But before you plunge into your job hunt or a formal game development education, thumb through a few of our books for aspiring developers "getting in the game." The following top 10 list contains what we believe are the best books available for aspiring game developers. Some of these books provide general introductions to the industry, while others focus on a specific discipline—but all are written for newcomers, and we think you'll gain a great deal by perusing at least a few of them. And although some book prices may seem high, we found many of them at discounted rates from online book retailers.

Good luck—and we look forward to seeing your name in the credits of the great computer and video games of tomorrow!

BRAD KANE *is a production coordinator at Pixar Animation Studios in Emeryville, Calif., and is a past editor of Gamasutra.com. His work as a freelance writer in the game industry can be seen in various industry publications. Please contact Brad at* ***bkane@gdmag.com*** *with questions or comments about this article.*

GAME DESIGN



Chris Crawford on Game Design

Author: Chris Crawford
Publisher: New Riders Games
Pages: 496
$39.99

CHRIS CRAWFORD IS legendary in the game industry, a forward-thinker who thrives on propagating ideas about game design into our collective knowledge. In *Chris Crawford on Game Design*, the author draws on his own experience as a game designer and discusses the challenges and rewards inherent in designing interactive entertainment.

Crawford's topics are diverse, ranging from the nature of conflict to the purpose of storytelling, and the book reads more as a collection of essays than a formal treatment of the topic. The sum of Crawford's intellectual explorations is a very enlightening read on the art of designing games.

The book includes extended examples from Crawford's own design portfolio, as well as game ideas he hopes one day to develop. Learning design straight from one of the industry's foremost creative thinkers is an opportunity not to be missed—so in spite of its decidedly right-brained approach, this book should be required reading for anybody considering game design as a career.

Beginning Game Level Design

Authors: John Feil and Marc Scattergood
Publisher: Thomson Course Technology
Pages: 256
$29.99

GAMEPLAY IS WHAT distinguishes a great game from a mediocre one, and level designers are the artisans whose job it is to make gameplay great. Level designers have the key job of synthesizing all the characters, weapons, objects, and other elements created by a design team into a playable game, making level design the heart of the development process.

Beginning Game Level Design addresses everything a beginner needs to know about the art of designing levels. Beginning with a simple paper design, the book teaches how to create compelling architecture and terrain, where to place enemy encounters, when to invoke traps and puzzles, and how to work story and dialogue into the overall gameplay equation. The authors also address the use of lighting and sound to enhance the gaming experience, and discuss the challenges associated with designing levels in different genres.

CONTINUED ON PG 74

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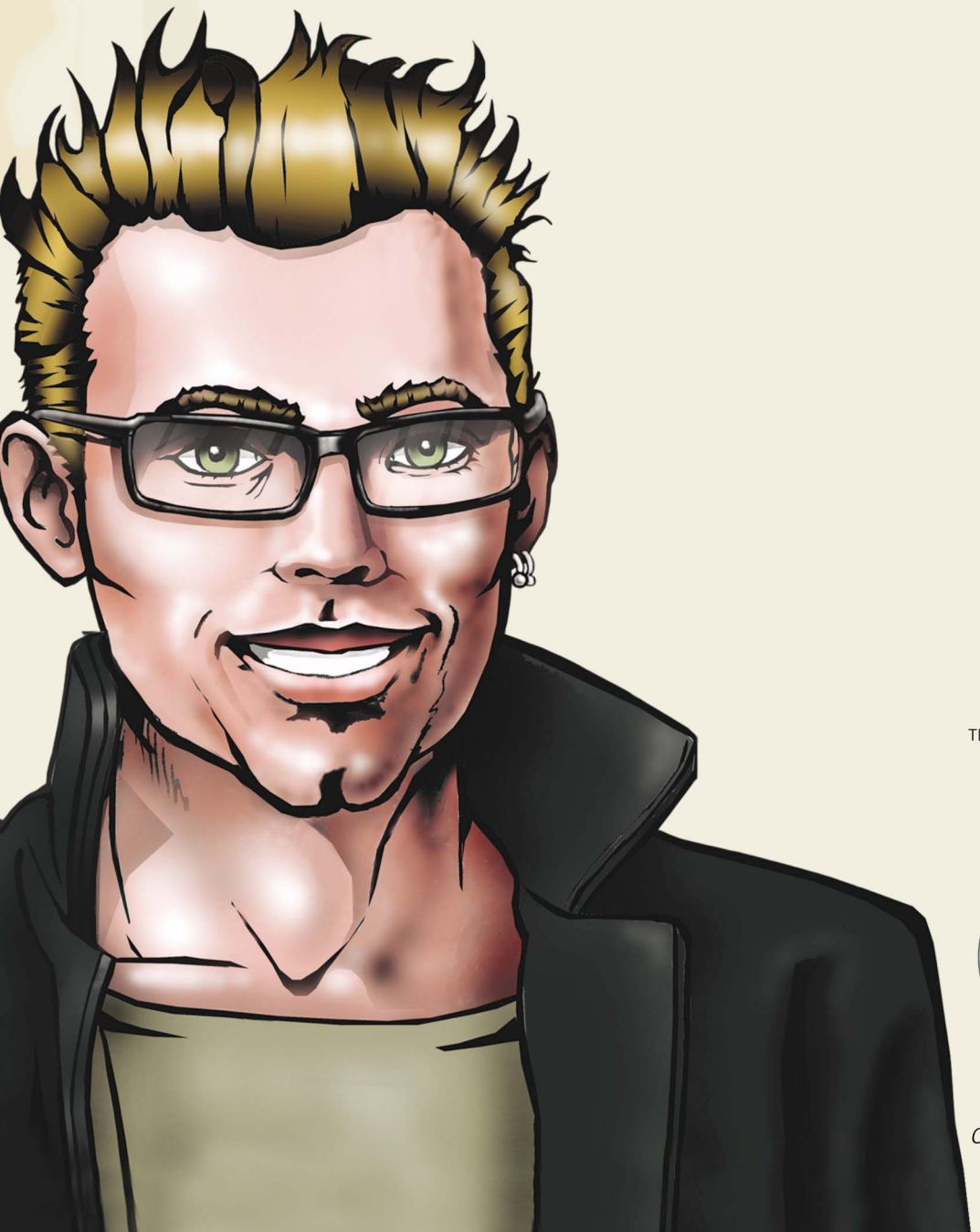

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