

**The Game
Artist's Guide
to Maya®**

Michael McKinley

SYBEX®

The Game Artist's Guide to Maya[®]

Michael McKinley



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San Francisco • London

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To my parents, without whom I wouldn't be here.



Acknowledgments

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Thanks to Arvee Garde for performing his martial arts mastery for the animation reference videos used in this book. For those interested, he trains in the Filipino martial art of Pekiti Tirsia Kali. He is also an instructor for the Texas Kali Association located in Austin. You can find more information about them at www.TexasKali.org.

Thank you as well to Michael Morlan for helping me with the filming. A great feature of this book wouldn't have been possible without his expertise and equipment. Check out his impressive body of work (and maybe hire him for some) at www.Michael-Morlan.net.

Big thanks to my co-workers: Eric P., John So., Steve, Michael Mo., Arvee, Tom, Ryan, John S., Dave, Wynne, Ben, Chip, John M., Sam, Jeff, Travis, Dan, Eric S., and Tommy! Thank you for putting up with me! Oh, and for that "job" thing, too.

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And last, but certainly not least, thank you to my parents and family. As the dedication at the beginning says, without you, I wouldn't be here. And I don't just mean genetically. I love you all!

Philippians 4:13

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Best regards,

A handwritten signature in black ink that reads "Dan Brodnitz". The signature is fluid and cursive, with a long horizontal line extending from the end of the name.

DAN BRODNITZ
Associate Publisher—Graphics
Sybex Inc.

About the Author

Michael McKinley is an artist for Warthog Texas (www.warthogtx.com), a game developer in Austin, Texas. He also writes online learning material for Maya software, which can be found at www.SimplelyMaya.com. Michael formerly helped teach Maya classes at Collins College in Tempe, AZ. More information about Michael and his projects can be discovered at his website: www.mtmckinley.net.

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Introduction

Welcome to *The Game Artist's Guide to Maya*! Whether you're a current 3D Artist in the game industry or you're looking forward to becoming one, this book will help you learn the skills and techniques you need to become successful.

This is the first Maya Press title to focus on creating game art, and I hope you enjoy it!

What You Will Learn from This Book

The Game Artist's Guide to Maya will take you through the basic game art development pipeline, taking a concept from paper to reality. You'll also learn about the game industry as a whole and the different artist positions that are generally available. Profiles of current industry professionals are spread throughout the book. Top artisans discuss how Maya has been used in many top-selling games. Their insight into the field can help answer some of the questions aspiring game artists may have.

Who Should Read This Book

Anyone who is interested in working as an artist in the game industry, who has recently joined the field, or perhaps who is a veteran of the industry interested in new game art possibilities will find the contents of this book very useful. It goes over real-life responsibilities that game art professionals have to deal with on a daily basis.

How to Use This Book

The chapters in this book go through the normal development process that a piece of game art takes from start to finish. If you are just beginning with a brand new project, you should be able to get through the process in no time by going through each chapter sequentially. Also, you can use each chapter to help you through each step of the development process separately, as you find the need.

Before you begin, you'll need to have some basic Maya skills. For example, you should know how to navigate Maya's interface and how to use the Translate, Rotate, and Scale tools.

Discussed tools and commands are explained in detail, so even those coming from other applications should be able to recognize functions from what they're used to and apply them effectively.

How This Book Is Organized

Chapter 1: The Game Industry Before delving into art production, this first chapter gives you a quick introduction to how the game industry and the game development pipeline works. This chapter goes over the differences between Developers and Publishers and discusses the many different artist jobs that are out there. It also includes demo reel advice for when you're ready to get that game job!

Chapter 2: Polygonal Modeling Polygonal Modeling is the first step in creating art assets. This chapter shows you how to create a game model using a concept image as a guide and sticking to predetermined real-time modeling limitations, such as a polycount.

Chapter 3: Texturing This chapter demonstrates UV mapping and layout techniques that you can use when preparing a model for texturing. It also includes detailed information about texture formats, resolutions, and how to create the different kinds of textures games use (normal maps, specular maps, etc.).

Chapter 4: Rigging Before animation can take place, animation controls must be created through the process known as rigging. This chapter walks you through the process, from setting up a skeleton to preparing blend shapes, and more.

Chapter 5: Animation This chapter delves into the world of animating for games. It demonstrates techniques for creating animation clips that can blend between each other using the Trax Editor.

Chapter 6: Particle Effects Particle effects can be used to add that final pizzazz to a model's visual performance. This chapter goes over how to create such effects using sprites as well as animated geometry.

Artist Profiles Sidebars that profile current game art professionals from all over the country are spaced throughout the book. Their perspectives on the game industry, and how Maya is used in it, are sure to interest any aspiring game artist.

Maya in Games Sidebars talk about many hit games that were created using Maya. These discussions can help you recognize the types of game visuals you can achieve with the software.

Hardware and Software Considerations

Maya is quite the athlete these days, as the program is capable of running on many different operating systems and computer setups. Alias specifies what hardware and software are compatible with Maya at their website:

http://www.alias.com/eng/support/maya/qualified_hardware/index.jhtml

In general terms, the faster the computer, the better. A nice, fast processor, a good chunk of RAM (memory), and a capable video card are all must-haves. A sizeable hard drive for storage is also very desirable. Here are some good numbers to shoot for:

- At least 2 to 2.5 GHz processor
- 512 MB to 1GB of RAM
- A good video card, such as the nVidia Quadro or ATI FireGL series
- 100GB or larger hard drive

The Book's CD

Concept Art: This folder contains high-quality concept images for the character that is created through the course of the book's instructions.

Images: This folder contains many sample high-resolution images of photo sources provided by the fine folks at www.3d.sk, one of the best human anatomy sources on the Internet. These images can be useful for anatomy reference or as texture sources. Also, any images needed for the tutorials can be found here.

Tutorials: This folder is divided into each chapter's specific section. Each chapter folder has the Maya project directories for the tutorials in question, which include saved stages of the character at almost every step of the way for easy reference.

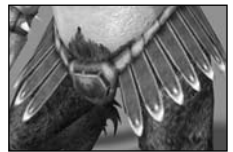
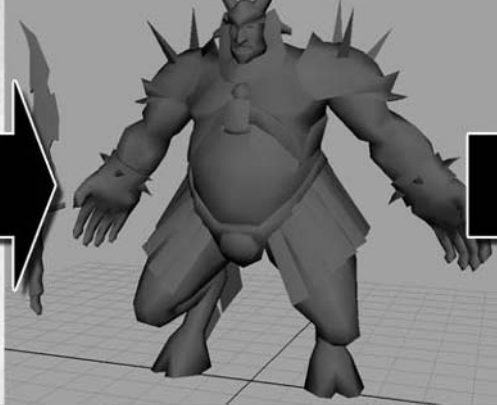
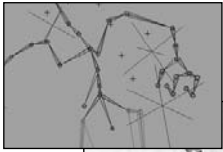
Video: Divided into a couple sections, the Video folder has model stages and animation references. The model stages show videos of each major step in the tutorial's processes. The animation references contain many sample videos of martial arts moves you can use in Chapter 5, "Animation," and in your own projects.

Maya Personal Learning Edition 6

Also on the CD is the Maya Personal Learning Edition 6 (Maya PLE 6), the free version of Maya that gives you access to Maya Complete for noncommercial uses. With this free version, you can do everything in the tutorials. The software runs on Windows 2000/XP Professional and Mac OS.

Contact the Author

Michael can be contacted through his website at www.mtmckinley.net. He also frequents the message boards of www.SimplyMaya.com. Feel free to say hello or to ask any Maya questions you may have.



The Game Industry

For many aspiring digital artists, a job in the game industry is the dream of a lifetime. Whether it's fashioning fantastic worlds and characters from scratch or painstakingly re-creating accurate World War II submarines, the life of a game artist can be greatly rewarding. A game artist's career comes with its fair share of challenging times, however. The more you know early in your career, the better off you will be. Before you delve into learning the ins and outs of art production, take a moment to understand not only what is expected of you as a game artist, but also what the game industry is all about.

1

Chapter Contents

Developers and Publishers

Artist Jobs in the Industry

Demo Reels

The Game Development Pipeline

Developers and Publishers

More often than not, games are created through a partnership between two distinct companies known as a *developer* and a *publisher*. The developer is the company that actually creates the game—design, art, programming, etc. The publisher takes that game, markets it, and distributes it throughout the rest of the country or world.

The relationships between developers and publishers have evolved in many ways. These relationships are normally divided into three categories:

First-Party Developers

Second-Party Developers

Third-Party Developers

First-Party Developers These developers are entirely owned by their publishers. One example is Nintendo. In addition to being Nintendo, the creator of the Nintendo-brand gaming consoles (Game-Boy Advance, Nintendo Gamecube, and the Nintendo DS) and publisher of games, they are also Nintendo, the developer. Their trademark games, such as *Super Mario Brothers* and *The Legend of Zelda*, are games they create themselves using teams of developers under their employ.

Second-Party Developers These independent developers are not owned by a publisher. They have signed agreements giving a specific publisher the exclusive right to publish their titles. An example is Naughty Dog, the developer of popular titles such as *Crash Bandicoot* and *Jak & Daxter*. They have signed exclusive publishing rights to Sony.



Note: The defining line between first-party and second-party developers is a thin one. Generally, a first-party developer can be considered an in-house department of the publisher, while a second-party developer is a separate entity.

Third-Party Developers These developers are the most common type. They sign contracts with a publisher on a per-game basis. In fact, many third-party developed games are released on multiple gaming platforms. Warthog is an example of this type of developer. They have developed games, such as *Harry Potter and the Philosopher's Stone*, for the Sony Playstation 2, Microsoft Xbox, and Nintendo Gamecube. For this particular title, Warthog partnered with Electronic Arts, a publisher that arranges distribution deals for all major game platforms.

Game Artist: Steve Nelson

Job Title Animator / 3D Artist

Studio Vicarious Visions

Credits *That's So Raven, Kids Next Door*

Studio Site www.vvisions.com

Personal Site www.stevensonanimator.com

- Q.** How and why did you get into the game industry?
- A.** I went to Savannah College of Art and Design, and graduated with a BFA in computer art with a focus in character animation. I have wanted to be an animator since the age of eight. I have wanted to play video games since the age of eight. There's only one way to do both and get paid for it.
- Q.** Describe your role at your studio.
- A.** Create animations and game assets for a variety of games and platforms.
- Q.** What has been the most inspirational to you in regard to your artwork?
- A.** I had a teacher in junior college that influenced me a lot, but to put it in terms that people can relate to I'd say Pixar (like every other computer animator), and the Loony Toons were huge. As well as the older Disney stuff like *Lady and the Tramp*.
- Q.** What is your favorite artistic style?
- A.** I'm a big fan of the cartoony art approach that games like *Beyond Good and Evil* and *The Legend of Zelda: The Windwaker* have taken. Although not to the point of it becoming Japanese Anime . . . just stylized.
- Q.** What is your favorite kind of game?
- A.** Oh, you're pressing me hard here. I'd say it's between real-time strategy, unique first-person shooters, and well-crafted role-playing games.
- Q.** How do you use Maya in your specific job?
- A.** Maya is used for everything from animation to level modeling. We use just about everything except things like cloth, fur, or high-detail rendering.
- Q.** What about Maya do you like better than other 3D applications?
- A.** The strongest animation toolset I have found in a 3D package to date.
- Q.** Which Maya tool could you not live without?
- A.** Definitely the Dope Sheet and Graph Editor (and the ability to manipulate within them directly).
- Q.** What advice might you have for the up-and-coming game artist?
- A.** Keep your nose against your computer screen. Spend more time learning your craft than anything else. As harsh as it sounds, the guy that puts forth the most effort usually comes out on top.

Artist Jobs

As an artist in the game industry, you will eventually work for a developer of some sort. But what jobs are available for someone of your talents? A variety of jobs are available in the art departments of game developers.



Note: The positions at game studios vary greatly. A 3D Artist at one studio may have a completely different set of responsibilities or duties compared to a 3D Artist at another. I can, however, give you a general idea of what you might expect in such positions. These generalizations should help you better understand the kinds of jobs available to you in this industry.

Junior Artist A Junior Artist is most likely the kind of job you can expect to find when first entering the industry. With little or no prior game experience, a Junior Artist will usually be hired into a company primarily to create background elements for the developing games and to learn about the development process.

Many studios hire Junior Artists on a temporary basis. These positions are used to ramp up the art staff to handle the stress period of the development schedule, eventually ramping back down as the game nears completion. You must prove that you are a capable and talented artist during these kinds of arrangements, so that you can increase your chances of becoming a permanent employee.

3D Artist The role of a 3D Artist (or Staff Artist) is fairly generic in title if not in duty. As unexciting as this position might sound, it could very well be the position with the most exciting variety of duties. As a 3D Artist, your duties could require you to create just about anything—vehicles and weapons, structures and environments, characters and creatures, planets and star fields, and beyond. In most cases, 3D Artists make up a large percentage of a studio’s art department, and the position can be divided into three main categories:

Modeler A Modeler is an artist responsible for creating the geometry, or shape, making up an object or character in a game. Modeling will be explained in greater detail in Chapter 2.

Texture Artist A Texture Artist takes the completed 3D model and applies textures to create the “skin” of the object. In most cases, the same person acts as both the Modeler and the Texture Artist. The process of applying textures to a model will be explained in greater detail in Chapter 3.

Animator An Animator is an artist who is responsible for rigging and animating the characters, creatures, etc., found in a game. They rarely are involved with the modeling or texturing of a game model. Instead, they focus on that model’s movement. Rigging and animating a game model will be explained in greater detail in Chapters 4 and 5, respectively.

Concept Artist Concept Artists are responsible for creating the look of the game world. The Concept Artist uses traditional art mediums such as pencil and paper (or stylus and monitor) to illustrate ideas and concepts (environments, characters, vehicles, etc.). These designs, once approved, are then given to the 3D Artists to develop into the game.

Character Artist, Environment Artist, Etc. A Character Artist (or an Environment Artist) is a specialist who is responsible for creating (and sometimes animating) the characters and creatures or the environments and structures found in a game. Such specialized positions are generally filled at larger studios, where there are enough people to make such positions viable.

FX Artist An FX Artist (or Effects Artist) is responsible for creating the many particle effects found in games. These can range from weather effects like rain and snow to action effects like the flash of a gun barrel. The vast majority of such effects are done entirely with *sprites*, small planes that are affected by dynamic forces. Particle effects in games will be explained in greater detail in Chapter 6.

Technical Artist A Technical Artist is like a blend between an artist and a programmer. While they have the creative responsibilities of an artist, they also have the scripting and programming skills to create scripts and plug-ins for Maya or other applications to make the artists' jobs easier and more efficient.

A Technical Artist can also be responsible for creating setup tools, such as a common animation rig that is used for all of the characters in the game.

Cinematic Artist The art created for cinematics is generally done in much the same way that computer graphics are created in television and film, without the constraints or limitations of their in-game counterparts. If you want to be a Cinematic Artist, this book might not help you as much as it will help you with some of the other jobs in this list. For more information on this job position, see *Maya Character Animation, 2nd Edition*, by Jae-jin Choi (Sybex, 2004)

Senior Artist A Senior Artist is someone who more than likely has been in the industry for a number of years or who has a couple of published games on their résumé. They are generally the ones given more important responsibilities, such as main characters or other critical elements, in a game project.

Lead Artist Lead Artists are put in charge of a group of artists within a team. They ensure that their group follows instructions and accomplishes their goals on time. They are generally the first people who review a finished art asset before it is sent along on the approval process. While Lead Artists incorporate more management into their roles than most others, they also tend to have at least some art production duties of their own. Depending on the size of the team, a project can have any number of Lead Artists.

Art Director The Art Director holds the top position in the artist chain of command. His responsibilities focus on managing and scheduling the rest of the art staff, hiring and firing, and other such managerial duties.

Game Artist: Jeffrey T. Hall

Job Title Lead Game Design Instructor

Studio Formerly Acclaim Studios SLC, currently Collins College

Credits *NBA Jam 2000, NBA Jam '99, Space Jam, VR Stalker, Return Fire, Secrets of the Luxor*

Personal Site http://www.Flatheadgames.com/j_main.htm

- Q.** How and why did you get into the game industry?
- A.** I started out doing freelance 3D animation after taking some classes. I later began teaching the computer painting and computer animation courses as a student at BYU and did so for a while. My freelance partner/mentor/friend knew some people who were starting a game company, and we started working for them from day one.
- Q.** Describe your role at your studio.
- A.** My positions and duties varied from video editing to cameraman to cinematic lead to modeling to motion editing and, of course, animation. I have always seemed to be in mentor/training capacities when I worked in games, so when the opportunity to teach 3D Animation came my way, I took it.
- Q.** What is your favorite kind of game?
- A.** I tend to like shooters with RPG elements in them since I don't have the time to dedicate to games that I used to.
- Q.** How do you use Maya in your specific job?
- A.** I teach seven different classes in Maya, covering all the topics from modeling to MEL.
- Q.** What about Maya do you like better than other 3D applications?
- A.** I like Maya because it is a very robust tool that expects you to be an intelligent user, and is fairly user-friendly as well.
- Q.** Which Maya tool could you not live without?
- A.** For games, the Split Poly tool. In general, any of the spline surface creation tools.
- Q.** What advice might you have for the up-and-coming game artist?
- A.** Work very hard to know your craft inside and out. Be willing to spend lots of time staying up-to-date with the software and techniques for modeling efficient, effective props and characters.

Note: How much money does a game artist make? The answer is highly relative. The latest results (as of this writing) from the Game Development Salary Survey can be found at http://www.gamasutra.com/features/20040211/olsen_01.shtml.



It's becoming more and more common to find many of these positions combined into a single person's job. For example, most Modelers are also expected to be very capable Texture Artists. When browsing a studio's Help Wanted list, always keep the other job criteria in mind. Make sure that you are at least familiar with the whole process that goes into creating a piece of game art, as you never know when you may be called upon to pick up the slack in another department.

Getting the Job

Getting that foot in the door of a game development studio can be challenging. It's mostly a matter of the quality of your portfolio, but applying for the right job at the right time with a little bit of luck can be a big factor. If you don't have much luck in your first few attempts to find a job, have patience and keep trying. With a quality portfolio and the willingness to travel, you should eventually find a job.

Your portfolio is the most important tool you need to get that first job. I also recommend creating a website. Even something simple with only your portfolio of images and animation and an e-mail address is better than nothing. A website will give your potential employers something that is easy to click through, so they can get a good idea of your potential skill. Preparing a demo reel is definitely a good idea. Here are some demo reel tips:

Don't make your opening too long. An opening sequence that shows your name and contact info is fine, but don't make it too long. Two or three seconds should be enough. Don't forget that a viewer can pause it. Try to make sure any blank, silent time before the reel starts is as short as possible. Employers can be pretty impatient, and if they don't see something within a few seconds, they might just discard the reel before it starts.

Put your best work first. Many employers might not have the patience to view an entire reel, or they may simply not have the time. Putting your best work up front will get their interest early, which may entice them to watch the rest of the demo. If a weak piece is the first thing they see, they may not wait to see the awesome work you display later.

Use a pleasant music track. A reel doesn't necessarily need to be an audio extravaganza, but you should put some sort of music to your reel to keep the viewer's ears busy. Silence during a reel's playback can seem boring, even if the work being shown is good. Adding that little aural touch can help make watching your reel a more appealing experience, which is always a good thing!

Keep it short and sweet. Try to limit the length of your reel to two or three minutes. As it approaches the four-minute mark, no matter how good the work is, employers may start looking at their watches. Get their attention with a short, high-quality reel. If you have additional work, they can look at your website or request more directly from you.

Don't dwell too long on a single piece. When your reel is short, focusing on a single piece for thirty seconds or more may seem conspicuously like padding your reel for length. Don't be afraid to have a shorter reel, but make sure the work is your best.

Keep your reel focused. Customize your reel for the job to which you are applying. If you are applying for a Modeler/Texture Artist position, don't have too much animation or other, off-topic work. Otherwise, you're just wasting the employer's time. If applying to different kinds of jobs, make multiple reels that focus on the jobs in question.

Label your work accurately. Make sure that the employer understands what your contribution is to the work they are viewing. If you collaborated with a group to complete a certain piece of work, send a *breakdown sheet*, a description of the reel that details the project title, what the piece was used for, and your role in its creation. This way employers can focus on your work and not someone else's. If you did all the work yourself, say so.

Be kind. Rewind. Possibly the most frequently committed mistake that job candidates make is forgetting to rewind their reels before sending them to potential employers. Don't forget to rewind your VHS reel before you submit it.



Note: Make sure you carefully read the submission requirements of a job ad. Many will specifically ask for a website or a VHS reel rather than other, more-modern media. CDs and DVDs are not as desirable because of the many different DVD brands and audio/video codecs out there that potentially won't work on their players. In contrast, a VHS tape works with any VCR.

Art Tests

Employers frequently ask applicants to complete an art test. This is usually a good sign, because it means they are interested in you for the job and they want to see how you perform a given task.

Art tests are also given to make sure that the work you are taking credit for is actually yours. If you deliver an out-of-this-world demo reel, but your art test results are poor, they may call into question your truthfulness.

But in most cases, the art test is to gauge your performance for their current project. After all, you may have shown in your demo reel that you can create awesome skyscrapers and motor bikes, but can you do just as well with a war elephant and a halfling tree camp? The art test will find out. Make sure you're prepared.

Crunch Time

The thought of creating games is obviously very appealing. One common misconception, however, is that working at a game studio means you're just playing games all day. That could not be further from the truth! In fact, your game-playing time might dwindle because of the amount of work that is involved. It *can* be fun work, but it *is* work just the same.

Most people interested in game development have heard of the dreaded *crunch time*. This refers to a period of time in a game's development schedule where overtime is mandatory in order to meet fast-approaching deadlines. What was once a fairly mild 9-hour day, suddenly balloons to 12, 15, or more hours a day. Crunch time can potentially last weeks or even months on end.

The best way to avoid massive amounts of crunch time is to do your best to get things done efficiently, accurately, and on schedule during your normal workday. Some crunch should probably be expected. However, if everyone on a project works together and makes full use of their time, it can be minimized.

The Game Development Pipeline

The art production pipeline is the path that a game object takes from beginning to end, from conception to effects. This path actually comprises only one facet of the overall Game Development Pipeline. Understanding the pipeline processes early is a great asset to potential employers, as it gets you that much closer to being able to contribute to it. The average development pipeline is as follows:

