

# Preface

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Whenever I withdrew to the computer room, my wife would say that I was off to my “fun and games.” I would flatly deny this accusation, saying that it was serious work that I was involved in. But later, when I emerged with a twinkle in my eye and excitedly asked her to take a look at my latest rendering, I knew that she was right. Working with 3D graphics is pure “fun and games.”

My goal in writing this book was to take all my fun years of playing in 3D and boil them down into something that’s worthwhile for you — the reader. This goal was compounded by the fact that all you Max-heads out there are at different levels. Luckily, this book is thick enough to include a little something for everyone.

The audience level for the book ranges from beginning to intermediate, with a smattering of advanced topics for the seasoned user. If you’re new to Max, then you’ll want to start at the beginning and move methodically through the book. If you’re relatively comfortable making your way around Max, then review the table of contents for sections that can enhance your fundamental base. If you’re a seasoned pro, then you’ll want to watch for coverage of the features new to Release 6.

If you’re so excited to be working with Max that you can’t decide where to start, then head straight for the Quick Start. The Quick Start is a single chapter-long tutorial that takes you through the creation of an entire scene and animation. This Quick Start was included in response to some feedback from readers of the first edition who complained that they didn’t know where to start. For those of you who were too anxious to wade through a mountain of material before you could create something, this Quick Start is for you.

Another goal of this book is to make it a complete reference for Max. To achieve this goal, I’ve gone into painstaking detail to cover almost every feature in Max, including coverage of every primitive, material and map type, modifier, and controller.

As this book has come together, I’ve tried to write the type of book that I’d like to read. I’ve tried to include a variety of scenes that are infused with creativity. It is my hope that these examples will not only teach you how to use the software, but also provide a creative springboard for you in your own projects. After all, that’s what turns 3D graphics from work into “fun and games.”

## Who Is Max?

Max is coming of age. Now with the number 6 attached to its name, it is starting to show some maturity. I’d say that version numbers are akin to dog years, which would place Max in its early 40s.

Before we go any further, I should explain my naming convention. The official name of the product in this release is 3ds max 6 with a lowercase *m*, but I simply refer to it as Max with a capital *M*. This reference is a nickname given to a piece of software that has become more familiar to me than the family pets (whose names are Fuzzy, Curious, and Parakeetsta, by the way). Note: I have not been successful in training Max to come when I call or to sit on command, but it will on occasion play dead.

One way we humans develop our personalities is to incorporate desirable personality traits from those around us. Max’s personality is developing as well — every new release has incorporated a plethora of desirable new features. Many of these features come from the many additional plug-ins being developed to enhance Max. With Release 6, many features that were available as plug-ins for previous releases have been adopted by Max. Several new features have been magically assimilated into the core product, such as mental ray. These additions make Max’s personality much more likable, like a human developing a sense of humor.

Other personality traits are gained by stretching in new directions. Max and its developers have accomplished this feat as well. Many of the new features are completely new, not only to Max, but to the industry, such as the Particle Flow interface. As Max grows up, it will continue to mature by adopting new features and inventing others. I just hope Max doesn't experience a mid-life crisis in the next version.

## About This Book

Let me paint a picture of the writing process. It starts with years of experience, which is followed by months of painstaking research. There were system crashes and personal catastrophes and the always-present, ever-looming deadlines. I wrote into the early hours of the morning and during the late hours of the night — burning the candle at both ends and in the middle all at the same time. It was grueling and difficult, and spending all this time staring at the Max interface made me feel like . . . well . . . like an animator.

Sound familiar? This process actually isn't much different from what 3D artists, modelers, and animators do on a daily basis, and, like you, I find satisfaction in the finished product.

## Tutorials aplenty

I've always been a very visual learner — the easiest way for me to gain knowledge is by doing things for myself while exploring at the same time. Other people learn by reading and comprehending ideas. In this book, I've tried to present information in a number of ways to make the information usable for all types of learners. That is why you see detailed discussions of the various features along with tutorials that show these concepts in action.

The tutorials appear throughout the book and are clearly marked with the "Tutorial" label in front of the title. They always include a series of logical steps, typically ending with a figure for you to study and compare. These tutorial examples are provided on the book's CD-ROM to give you a first-hand look and a chance to get some hands-on experience.

I've attempted to "laser focus" all the tutorials down to one or two key concepts. This means that you probably will not want to place the results in your portfolio. For example, many of the early tutorials don't have any materials applied because I felt that using materials before they've been explained would only confuse you.

I've attempted to think of and use examples that are diverse, unique, and interesting, while striving to make them simple, light, and easy to follow. I'm happy to report that every example in the book is included on the CD-ROM along with the models and textures required to complete the tutorial.

The tutorials often don't start from scratch, but instead give you a starting point. This approach lets me "laser focus" the tutorials even more; and with fewer, more relevant steps, you can learn and experience the concepts without the complexity. On the book's CD-ROM, you will find the Max files that are referenced in Step 1 of most tutorials.

I've put lots of effort into this book, and I hope it helps you in your efforts. I present this book as a starting point. In each tutorial, I've purposely left most of the creative spice out, leaving room for you to put it in — you're the one with the vision.

## Fourth time around

This book is now in its fourth edition and, like aged cheddar cheese, is getting better with time. This edition posed an interesting dilemma. The edition for Max 4 clocked in at 1,246 pages, which was the largest number of pages that can be bound into a paperback book. So, for Max 5, I needed to rework and tighten the content to make room for pages where the new features could be covered, which was an tough task, but I was happy to say I succeeded by cramming in an additional 400 pages worth of content into the *3ds max 5 Bible*. However, when the book came back from the printer, it weighed in at only 1,106 pages, making the reader think that the book was put on a diet. It turned out that the editors who laid out the book decided to use a tighter layout, thereby saving 140 pages while providing the additional content.

Now that I'm working on a version covering Max 6, I'm delighted to have that extra 140 pages to cram full of information, and the editors are already looking at an even tighter format. At this rate, the next couple of editions will be shipping with a magnifying glass.

There have been several other changes to this edition. In an effort to add some new life to many of the older tutorials (several of which desired a chance to retire), I have secured a new set of Viewpoint models that I've used to replace many of the old tutorials. I've also included a new Quick Start that lets you play with a monster truck.

## How this book is organized

Many different aspects of 3D graphics exist, and in some larger production houses, you might be focused on only one specific area. However, for smaller organizations or the general hobbyist, you end up wearing all the hats — from modeler and lighting director to animator and post-production compositor. This book is organized to cover all the various aspects of 3D graphics, regardless of the hat on your head.

The book is divided into the following parts:

- ◆ **Quick Start** — This single chapter (which is actually a chapter in Part I) is an entire animation project presented in several focused tutorials. It is designed to whet your appetite and get you up to speed and producing animations immediately.
- ◆ **Part I: Learning the Max Interface** — Whether it's understanding the interface, working with the viewports, dealing with files, or customizing the interface, the chapters in this part get you comfortable with the interface so you won't get lost moving about this mammoth package.
- ◆ **Part II: Working with Objects** — Max objects can include meshes, cameras, lights, Space Warps, and anything that can be viewed in a viewport. This part includes chapters on how to reference, select, clone, group, link, transform, and modify these various objects.
- ◆ **Part III: Modeling** — Max includes several different ways to model objects. This part includes chapters on working with spline shapes, meshes, polys, patches, NURBS, compound objects like Lofts and Morphs, and particle systems.
- ◆ **Part IV: Materials and Maps** — With all the various materials, maps, and parameters, understanding how to create just what you want can be difficult. These chapters explain all the various types and how to use them.
- ◆ **Part V: Cameras** — This part describes how to control cameras and use the Camera Matching and Tracking utilities and the Multi-Pass Camera effects.
- ◆ **Part VI: Lighting** — This part describes how to create and control the standard lights, as well as coverage on advanced lighting, radiosity, and global illumination.
- ◆ **Part VII: Animation** — To animate your scenes, you'll want to learn about keyframing, the Track Views, constraints, and controllers. This part includes a chapter specifically on expressions.
- ◆ **Part VIII: Character Animation** — I cover creating and working with characters, bone systems, skinning, rigging, and character modeling in this part. I also provide complete coverage of the various inverse kinematics methods.
- ◆ **Part IX: Dynamics** — This part includes coverage of Space Warps, the Dynamics utility, and all the cool features found in Reactor.
- ◆ **Part X: Rendering** — To produce the final output, you can render the scene as described in this part. In addition, this part discusses environments, Render Elements, Render Effects, network rendering, raytracing, and mental ray.
- ◆ **Part XI: Compositing and Post-Production** — This part describes the compositing process using external tools, as well as post-processing using the Video Post interface.
- ◆ **Part XII: MAXScript and Plug-Ins** — This part provides details on using Max's scripting language, MAXScript, and on using plug-ins.

- ◆ **Part XIII: Max in Action** — Max is used in many different industries and this part addresses specific features used to enable Max for games, visualization, and special effects.
- ◆ **Appendixes** — At the very end of this book, you'll find four appendixes that cover the new features of Max 6, installation and system configuration, Max keyboard shortcuts, and the contents of the book's CD-ROMs.

## Using the book's icons

The following margin icons are used to help you get the most out of this book:



**Note**

Note boxes highlight useful information that you should take into consideration.



**Tip**

Tips provide an additional bit of advice that will make a particular feature quicker or easier to use.



**Caution**

Cautions warn you of a potential problem before you make a mistake.



**New Feature**

The New Feature icon highlights features that are new to Release 6.



**Cross-Reference**

Watch for the Cross-Reference icon to learn where in another chapter you can go to find more information on a particular feature.



**On the CD-ROM**

This icon points you toward related materials that are included on the book's CD-ROMs.

## The book's CD-ROMs

Computer book CD-ROMs are sometimes just an afterthought that includes a handful of examples and product demos. This book's CD-ROMs, however, include a full, working trial version of 3ds max 6. Max is an expensive piece of software to just play around with, but the trial version gives you 30 days to try out the software and gain some valuable experience. Appendix D, "What's on the CD-ROMs," supplies the details of the content on the CD-ROMs.

The CD-ROMs include a selection of 3D models that you can use in your projects if you choose. Many of these models are used in the tutorials. The CD-ROMs also include the Max files for every tutorial.

If you haven't noticed yet, most of this book is printed in black and white. This can make seeing the details (and colors) of the figures difficult. The CD-ROM includes a complete searchable version of the book along with all the figures in color.

## Color insert pages

The possibilities of Max are endless, but many individuals and groups have pushed the software a long way. As a sampling of the finished work that can be created, I've included a set of color insert pages that showcase some amazing work done with Max. The 3D artists represented in these pages give you some idea of what is possible.

# Acknowledgments

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I have a host of people to thank for their involvement in this major work. The order in which they are mentioned doesn't necessarily represent the amount of work they did.

Thanks to my family, Angela, Eric, and Thomas, without whose support I wouldn't get very far. They are my QA team who always provide feedback on my latest example. We have had many family brainstorming sessions to think of a good tutorial example. Thomas has taken an interest in Max and recently produced a Halloween picture using Max that won an award at his school. Maybe if he keeps it up, he can inherit this work at some future date (then he can tell funny stories about me).

In the first edition, the task at hand was too big for just me, so I shared the pain with two co-authors — Dave Brueck and Sanford Kennedy (both of whom have gone on to write books of their own). I still would like to thank them for their work, which, although overhauled, still retains their spirits. In subsequent editions, I've decided to do all the updates solo, until now. Facing this edition, I once again put out a cry for help and was answered by Sue Blackman, a contributing artist whose work appears in the color insert. Sue provided several excellent examples that show off the power of the Track View interface. Thanks for your help, Sue.

Major thanks to the editors and personnel at Wiley. I'd like to specifically thank Tom Heine, who turns out to be just as friendly in real life as he is on the phone. Tom, it was great to finally meet you at Siggraph this year. Huge thanks to Marty Minner, who kept the project on task despite a tough tragedy and to Gwenette Gaddis Goshert for her excellent copyediting input. I'd also like to thank Chris Murdock for taking on the technical editing even though he felt like playing with another version of Max. What a great virtual team we have here. Additional thanks go out to Carmen Krikorian and her co-workers in the Media Development department for chasing down the required permissions and for compiling the resources for the CD-ROMs, and finally, to the entire staff at Wiley who helped me on this journey.

The various people who work in the graphics industry are amazing in their willingness to help and support. I'd like to thank first of all David Marks and the entire Discreet beta team for getting me the product when I needed it. I'd also like to thank the talented people at Zygote Media, Curious Labs, and Viewpoint Digital Media for many of their models, which make the examples much more interesting (you can only do so much with the teapot after all). Thanks to Tom Avikigos at Digimation for help in securing a new set of Viewpoint models and Daniel Brown at Adobe for getting me the Adobe products that I needed. Additional thanks goes out to David Mathis, Joe Poppa, and Chris Murdock for completing models used in some of the tutorials.

Finally, I'd like to thank the many artists who contributed images for the color insert pages for sharing their talent, knowledge, and vision with us. They are an inspiration to me.