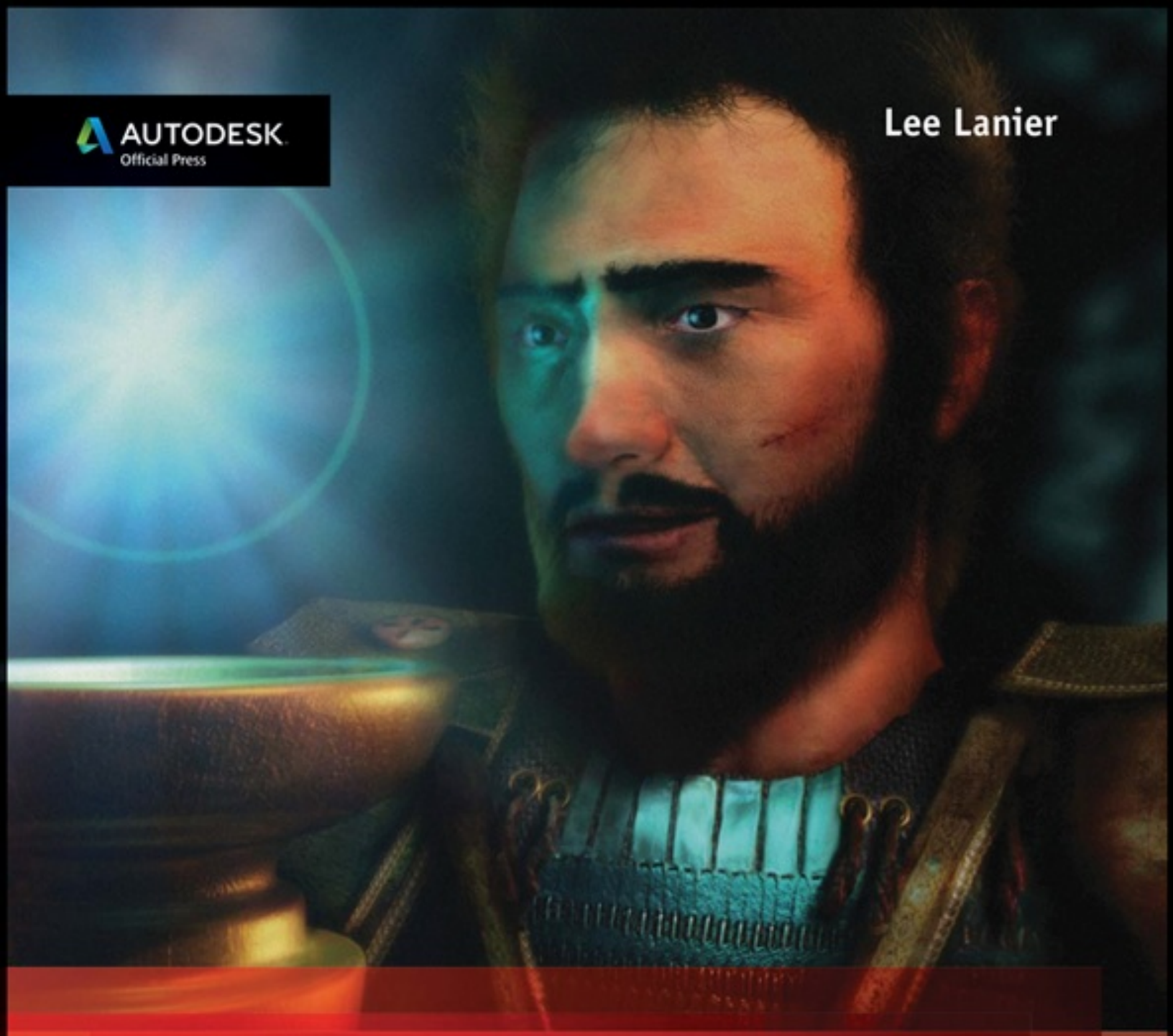

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Lee Lanier

Advanced Maya Texturing and Lighting

Third Edition

SYBEX
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Third Edition

Lee Lanier

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Dedication

Art is always worth the effort.

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Many thanks to all those who've bought previous editions of this book. What can I say? You rock. Thanks to the fine Sybex staff and freelancers, including Mariann Barsolo, Christine O'Connor, Jim Compton, Liz Welch, Josh Chase at Word One, Maureen Forys at Happenstance Type-O-Rama, as well as my technical editor Grey Hash.

About the Author

Lee Lanier has worked as a professional computer animator and visual effects artist since 1994. While at Buena Vista Visual Effects at Walt Disney Studios, he created VFX for numerous feature films. While at PDI/DreamWorks, he served as a senior animator on *Antz* and *Shrek*. Along the way, he directed a series of independent, animated short films that went on to play 200+ film festivals, museums, and art galleries worldwide. His work has been featured at such venues as Sundance, Slamdance, SXSW, the Ottawa International Animation Festival, Boston Museum of Fine Arts, and the Smithsonian Institution. As a world-renowned expert in the VFX field, Lee has written high-end software books that have sold 30,000 copies, has authored VFX training videos for lynda.com, has taught VFX compositing at the Gnomon School of Visual Effects in Hollywood, is a member of VES (Visual Effects Society), is the executive director of the Dam Short Film Festival, and co-manages the Boulder City branch of Dr. Sketchy’s Anti-Art School. He has worked on over 70 features, shorts, music videos, trailers, and commercials.

Introduction

> There's nothing quite like turning a gray-shaded model into something that looks real—or that could be real.

When I wrote the first edition of *Advanced Maya Texturing and Lighting* in 2006, it was to shed more light on the powerful lighting and texturing systems found in the Autodesk® Maya® program. I'm very flattered to meet people to this day who drag around old dog-eared copies of that book. Yet the success of this book is not so much a compliment to my writing skills as it is a nod to the amazing possibilities within the reach of any animator willing to put in hard work and long hours. After all, there's almost nothing you *can't* create with a good 3D package like Maya.

I should stress that I am self-taught. In 1994, I sat down at a spare seat of Alias PowerAnimator 5.1 and started hacking away. After several years and various trials by fire, 3D became a livelihood, a love, and an obsession. Along the way, I was fortunate enough to work with many talented artists at Buena Vista Visual Effects at Walt Disney Studios and Pacific Data Images (which became PDI/DreamWorks). In 2000, I switched from PowerAnimator to Maya and have since logged tens of thousands of hours with the subject of this book.

Because of my unusual combination of an informal and professional background, I do not profess to know everything there is to know about Maya. However, I've made a point to cover the most critical aspects of texturing, lighting, and rendering, at least from my personal and professional perspective.

Third Edition

The first edition of *Advanced Maya Texturing and Lighting* was written with Maya 7.0 and published in 2006. The second edition was written with Maya 2008 and published in 2008. This edition represents a major revision and is written with Maya 2014 and Maya 2015. Although the core functions of Maya have remained the same since 2006, you'll find many significant updates that are worth learning. These include new Maya utility nodes, upgraded mental ray® shaders, nDynamics simulation tools, the new Node Editor window, the Bifröst fluid simulation system, advanced indirect illumination components like importons and irradiance particles, more robust viewport rendering options, and expanded render pass support.

Who Should Read This Book

Advanced Maya Texturing and Lighting, Third Edition, is designed for anyone with a working knowledge of Maya. Specifically, this book was written with the following people in mind:

- Students who are reaching the upper levels of their 3D curriculum
- Hobbyists or amateurs who are self-starters and would like to rapidly refine their Maya skills
- Professionals working in other areas of Maya, such as animation or rigging, who would like to expand their knowledge of texturing and lighting

Although most of the information in this book is Maya-specific, you can apply the texturing and lighting theories and approaches to other 3D programs. This book also refers to digital image manipulation software such as Adobe Photoshop and compositing software such as Adobe After Effects. Basic knowledge of such programs is useful but not mandatory when using this book.

How to Use This Book

Advanced Maya Texturing and Lighting, Third Edition, is divided into 13 chapters.

Chapter 1 discusses lighting history, technique, and application, as well as basic color theory. Naturalistic, stylistic, 1-point, 2-point, and 3-point lighting are covered in detail. If you are new to lighting, this is the best place to start.

Chapters 2 and 3 detail Maya lights and shadows and how to apply them properly. Specialized effects, such as Environment Fog, Light Fog, Paint Effects, Maya Fur, and Maya nHair, are also covered.

Chapters 4 through 8 delve deeply into Maya materials and utilities. Most Maya books barely scratch the surface in this area. If you've ever wondered what each Maya node actually *does*, check out these chapters. Custom networks are also discussed at length. Numerous examples are provided with clearly labeled illustrations, and you'll find that the examples are easy to follow (as much as such a complex subject allows). I've also included detailed information on the Node Editor.

Chapter 9 takes a detour and reviews UV texture space issues. It also covers bump, normal, and displacement mapping.

Chapter 10 concentrates on scene optimization and batch rendering preparation.

Chapters 11 and 12 delve deeply into raytracing, mental ray shaders, Global Illumination, and Final Gathering. Here you'll find many of the important new Maya 2015 features.

Chapter 13 looks at color management within Maya, as well as HDR workflow and mental ray render pass management.

If you're fairly new to Maya or 3D in general, I suggest starting with Chapter 1 and then work your way through the book. If you're experienced with Maya, I recommend hitting the chapters that contain information that's poorly documented by other sources. In this case, Chapters 6, 7, and 8 should prove the most interesting.

Eleven chapters of *Advanced Maya Texturing and Lighting, Third Edition,* contain tutorials. These tutorials allow you to practice advanced techniques that are employed regularly in the visual effects and animation industries. Each tutorial is accompanied by ample illustrations and completed Maya scene files. In addition, short step-by-step guides are included for specific tasks in every chapter.

Tutorial Files

Several gigabytes of Maya scene files, texture bitmaps, and QuickTime movies accompany this book. Many of the book's figures include the original Maya scene file, which is listed with the figure captions. (Note that some of these files contain simplified geometry.) The tutorial files are hosted on the official Sybex *Advanced Maya Texturing and Lighting, Third Edition* website, which is:

www.sybex.com/go/advancedmaya

The tutorial files are organized in the following manner:

Directory	Contents
`Project_Files\Chapter_n\scenes\`	Maya 2014 and Maya 2015 scene files saved in the MA format
Project_Files\Chapter_n\images\	Reference and high-dynamic range bitmaps saved as TIFF and HDR files
`Project_Files\Chapter_n\textures\`	Texture bitmaps saved as TIFF, PSD, and JPEG files
`Project_Files\Chapter_n\movies\`	Sample QuickTime MOV movies