



INTRODUCING MUDBOX™

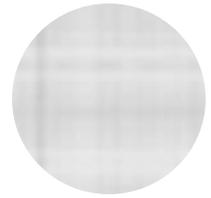
Ara Kermanikian



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Introducing Mudbox™



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ARA KERMANIKIAN



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Best regards,

A handwritten signature in black ink, appearing to read 'Neil Edde', with a stylized flourish at the end.

Neil Edde
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To Erin, William, Jacob, and my parents—love always and forever

Acknowledgments

This book is a result of many deliberate and accidental events, and there are many people to thank and acknowledge for their involvement in making these events happen. If it weren't for them, you wouldn't be reading this book. ■ A very special and heartfelt thanks to my parents for their love, dedication, faith, and support over the years. Thanks to my dear soul mate, Erin, for her encouragement, understanding, and devotion while I worked on the book. Thank you to my dearest sons, William and Jacob, for letting me see life as I had never seen it before; I hope this book is the start of my being able to do the same for you. ■ Another person pivotal to making this book possible is a dear friend and fellow trench mate, Eric Keller. As a classmate, he asked to include an image of one of my ZBrush digital sculptures in his book *Introducing ZBrush* (Sybex, 2009), and it started a friendship that continues to grow. ■ This book would not have been possible without Mariann Barsolo, who asked me to take the leap and write it, and then rode shotgun throughout the process. I would also like to thank Mariann for putting together an excellent team to work with me. Thanks to Keith Reicher for serving as technical editor and providing information about the Mac-specific features of Mudbox, and to Lisa Bishop for being an excellent development editor. Thanks to Liz Britten for her magic touch as production editor, and for letting me see the content in book form rather than a Microsoft Word file and a bunch of images. Thanks to Ryan Sneed for his cover design. Thanks to Sharon Wilkey, copy editor, and all of the wonderful people at Sybex/Wiley who were involved in the production of this book. Finally, a special thanks to Neil Edde, publisher, and Pete Gaughan, editorial manager, for their involvement in the synchronicity of this book coinciding with the release of the 2011 version of Mudbox. ■ I was elated and surprised when one of my favorite artists, and constant source of inspiration, Ashley Wood, responded to an email I sent asking to use his robot creation Bertie as the subject of the exercises in Chapters 1, 3, and 4. I would like to extend my extreme gratitude to him for allowing us to use it. To model Bertie in 3D was a very cool experience, and it is my hope that your work with Chapters 3 and 4 will create interesting variations as well. Please note, however, that Bertie is copyrighted, and the likeness and files on the DVD can be used only as the subject for the

exercises and for personal education, noncommercial projects. ■ Thanks to the artists Maik Donath, Marcia K. Moore, Kenichi Nishida, Andreja Vuckovic, Rudy Wijaya, and Pete Zoppi for contributing work to the Gallery. It is good to know that there are such amazing artists creating incredible art with Mudbox. Their work continues to inspire me. ■ Thanks to the original creators of Mudbox, Andrew Camenisch, Dave Cardwell, and Tibor Madjar, and the Autodesk team that continues to develop and enhance the program. A huge thanks to Dave and Andrew for answering my questions. Also, thanks to Brittany Bonhomme, Jodi Anderson, and Elizabeth Garreau from Autodesk for their help and support. ■ Very special thanks to Domi Pitturo and Mimi Tran at Icon Imaging for providing me with the 3D scan data and helping me with the content in Chapter 7. It is truly a pleasure and privilege to work with artists so integral to the development and implementation of 3D scanning technology. Please note that the scan data for the Chapter 7 is copyrighted, and the likeness and files on the DVD can be used only as the subject for the exercises and for personal education, noncommercial projects. ■ Big thanks also to Dan Gustafson from NextEngine for his help with the NextEngine desktop scanner information and images in Chapter 7. ■ Thanks to Phil Dench at Headus for making UVLayout, one of the most brilliant software applications I have ever used. ■ Thanks to Thomas Teger at Luxion for assisting me with KeyShot in Chapter 9. ■ Thanks to Ofer Alon for creating ZBrush and launching the world of digital sculpture. ■ A huge debt of gratitude to Scott Spencer for being an incredible anatomy and advanced ZBrush teacher at the Gnomon School of Visual Effects, and writing two indispensable books on digital character design and sculpting human anatomy. I feel extremely fortunate to have taken your class, and appreciate your feedback on the anatomy of the model in Chapters 7 and 8. ■ I also want to acknowledge Kevin Hudson at the Gnomon School of Visual Effects, and Rudy Wijaya, lead modeler at shadedbox, for teaching me everything I know about polygon modeling. ■ I want to take this opportunity to thank all my instructors at the Gnomon School of Visual Effects: Jeremy Engleman, Ryan Kingslien, Loren Klein, and Ergin Kuke, for the excellent education I received in their areas of expertise, and want to extend that gratitude to Alex Alvarez for being the beacon of education in this field. ■ A special thanks to Joey Jones from shadedbox for his excellent Maya animation class at the Art Center College of Design. ■ Thanks to my friend Brian, who cured my cabin fever by dragging me out to see a movie or have a coffee break in between writing sessions.

About the Author

Ara Kermanikian is a freelance character, vehicle, and set designer in the entertainment industry. He has been working in the field since 2007, after a 22-year career in the software industry, 18 of which were at Microsoft as a systems engineer, engineering manager, and technology director.

He holds a bachelor of science degree in computer science from California State University, Northridge, and has studied numerous courses with leaders in the field such as Scott Spencer, Kevin Hudson, Jeremy Engleman, and Joey Jones at the Gnomon School of Visual Effects and Art Center College of Design.

Ara has been passionate about building models from his childhood years. His exposure to VU-3D on the Sinclair Spectrum fueled his passion for computer graphics, which continues to the current day. Ara loves modeling and digital sculpting because he can bring characters and images that fuel his imagination onto a digital canvas and visualize them in three dimensions.

He has written reviews and master classes for publications such as *3D Artist* magazine, and has had his work showcased in galleries of several Sybex books.



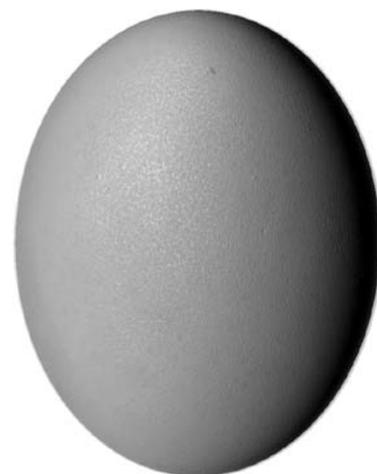
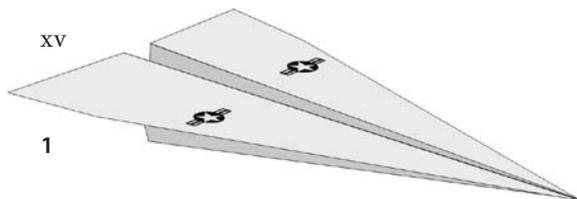


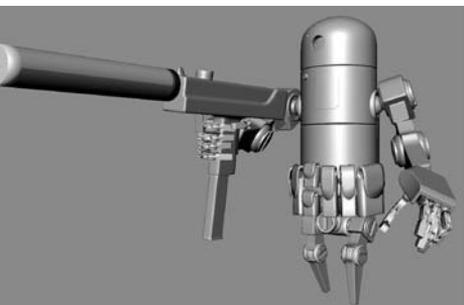
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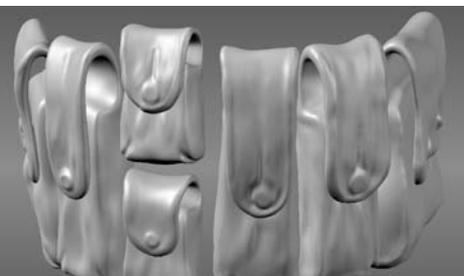
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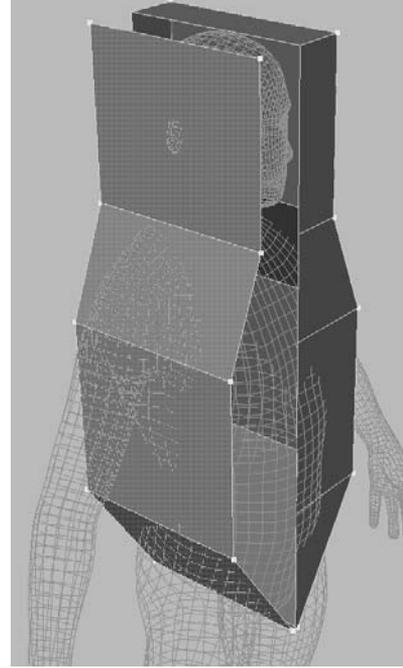
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Introduction

Digital sculpting gives you the ability to create anything you can imagine. You can model, paint, and present characters, props, sets and environments in ways never before possible. After learning ZBrush, the leading digital sculpting software in the industry, I was curious to see what Mudbox had to offer. Upon using the software, I discovered that it provided greater accessibility to artists who were too intimidated by ZBrush's interface, or who wanted to transfer their skills and familiarity with leading 3D software packages, such as Maya, to this medium. However, I found limited resources in my search to learn about the software, and even though I find the help in Mudbox to be top-notch, discovered that there were no books on the topic. I decided to write this book to fill the gap.

The aim of this book is to be a companion that teaches you the concepts of digital sculpting and 3D painting via Mudbox, to produce results that can stand on their own or that are part of a workflow. The book is organized to teach you the concepts in waves. Chapter 1 takes you through the pipeline and gives you an idea of the workflow, and subsequent chapters give you more detail on specific stages of that workflow and expand on the requirements, concepts and capabilities of Mudbox.

I recommend going through Chapter 1 and using what you learn there to experiment further. When you run into situations where you need to ratchet up the complexity of what you are working on, jump to the specific chapter on that topic to get more information and exercises. You can also go through the book sequentially to learn the topics, because the chapters build on each other. Chapter 2 provides an in-depth tour of the software to help you understand the details of the user interface.

This is a pivotal and exciting time in the entertainment industry, as software such as Mudbox and ZBrush can contribute exponential advances to the production pipeline of special effects. Revolutionary capabilities continue to be added with every release, and the possibilities of what can be visualized with this art form are soon becoming limitless.

I hope this book will fuel your interest in learning about digital sculpting and 3D painting with Mudbox and will help you learn the intricacies of how to use it to achieve your potential in creating your own visions.

Who Should Read This Book

This book is for digital artists who want to use Mudbox to sculpt and paint high-definition digital models, such as characters, vehicles, props, or sets for film, television, advertising,

video games, and both 2D and 3D print. Chapter 1 uses a simple exercise to run through the Mudbox production pipeline. The subsequent chapters delve deeper into these stages and produce results that would be required at different stages of the pipeline.

This book is intended for readers with a background in art, and an understanding of the basics of 3D space and the basic workings of 3D software. It assumes you to be a sophisticated beginner or intermediate user of Mudbox. The book is mostly focused on Mudbox, but also covers other tools such as Maya, Photoshop, UVLayout, and KeyShot. Although a basic knowledge of the workings of those tools is assumed, I have also included the results from those programs for the various exercise steps if you do not have them available to you.

Mudbox is an artist's tool, and I cover the topics from an artistic as well as a technical perspective. My hope is that upon reading this book, you will have all the answers to your questions about the technology and workings of Mudbox to maximize your workflow and to focus on creating your art.

What You Will Learn from This Book

This book introduces you to the tools and capabilities of Autodesk Mudbox 2011. You will learn the different stages of a production pipeline in which Mudbox is applicable, and the workflow of those stages.

You will learn how to start your model from a basic primitive shape, develop it into a sophisticated, realistic-looking digital sculpture, and render it using Mudbox, mental ray in Maya, and Luxion KeyShot.

You will learn how to import models into Mudbox and to sculpt high-frequency detail to give the surface a weathered and realistic look.

You will also learn how to tune surface materials and paint your model in 3D as well as how to use paint layers to create composite surface results to further your model's realistic representation.

You will learn about planning your sculpture and taking it through the various stages such as posing, laying out UVs, and sculpting on various subdivision levels while customizing the Mudbox sculpting tools to get the results you want. I also cover the basics of 3D meshes and UVs and how to troubleshoot and optimize their use in your Mudbox workflow. You will learn how to import 3D scan data and how to use Mudbox to extract the details of the scan and place them on geometry you can sculpt and paint.

All the content on the DVD was specifically created for the purpose of demonstrating the concepts in the chapters. I greatly enjoyed creating this content and hope you get the same enjoyment in sculpting and painting your own creations.

Hardware and Software Requirements

To complete the exercises in this book, you will need Mudbox 2011 and a computer that meets the systems requirements listed for Mudbox on the Autodesk website.

I highly recommend that you pay close attention to the requirements for the video card, making sure you that you are using a certified video card for Mudbox. Mudbox uses OpenGL as its rendering engine, and you need a video card that will accelerate OpenGL. Certified Nvidia Quadro or AMD FireGL cards are your best bet.

The next most important hardware requirement is memory. As you subdivide your models, the memory requirement to store and process them also grows. Even though the system requirements mention 2GB, I highly recommend you have at least 4GB, if not 8GB or 16GB of RAM if you can accommodate for it.

The next important requirement is the operating systems, which are linked to the preceding memory requirement. You can use Mudbox in Windows XP, Vista, or 7, or on Mac OS X 10.6.2. The Mudbox interface is mostly identical in all of these; however, you probably want to use Mudbox on the 64-bit version of these operating systems because 32-bit operating systems can only access 4GB of RAM. With the 2011 version, Mudbox exclusively works in 64 bits on the Mac, so if you are on version 10.6.2 and above, you probably have the required Core 2 Duo or newer processor to support Mudbox. In Windows, you need the 64-bit version of Windows XP, Vista, or 7 and an Intel EM64T processor or an AMD Athlon 64 or AMD Opteron processor.

Make sure you also have plenty of hard disk space because, in addition to taking up a lot of memory, Mudbox models, which could easily be made up of multimillion polygons, also take up hard disk space when you save them.

Finally, you need a digital tablet, such as a Wacom Intuos or Cintiq, based on your preference of having the tablet functionality detached or superimposed on the screen you are working on. Although you can follow the exercises in this book by using a three-button mouse, I have yet to see someone who is a proficient digital sculptor and 3D painter use just a mouse to achieve good results.

How to Use This Book

The chapters in the book are organized in a sequential manner; the content of latter chapters builds on the concepts introduced in earlier ones to help you delve deeper into the topic. The chapters are also broken up by topic, so you may jump to any chapter that pertains to the topic with which you need immediate help. Much thought was given to which

chapter exercises would be best accompanied with videos to help you watch the sequence of the exercise steps as a movie clip.

All of the topics are augmented and supported with artistic concepts such as form, gesture, proportion, rhythm, balance, and composition.

The book also has a full chapter dedicated to lighting and rendering your model in Mudbox, as well as in mental ray in Maya and in a top-notch rendering software called KeyShot.

Chapter 1, “Getting Your Feet in the Mud: The Basics of the Mudbox Production Pipeline,” runs you through the pipeline by creating a model of an egg and giving it the surface texture of an eggshell. Then you will paint it to have the material and texture of an egg. Finally, you will view your output in Mudbox, or export your work to Maya and render it in mental ray.

Chapter 2, “The Mudbox User Interface,” gives you an in-depth tour of the interface of Mudbox with explanations of regions, panels, icons, tools, dialog boxes, and options.

Chapter 3, “Detail-Sculpting an Imported Model,” goes through an example of importing an intricate model and using Mudbox to sculpt real-world wear and tear in fine detail on the surface of the model.

Chapter 4, “Painting and Texturing an Imported Model,” takes the work you did in Chapter 3 and allows you to apply paint to the surface features to push the realism of the model further.

Chapter 5, “Digital Sculpting, Part I,” goes deeper into digital sculpting concepts, such as the foundation of 3D models, and the stages they would need to go through in Mudbox. The chapter also covers advanced sculpting techniques and delves deeper into the sculpting tools and their properties.

Chapter 6, “Digital Sculpting, Part II,” builds on the previous chapter with the inception of a base mesh model in Maya, for which you will then create UVs in UVLayout, and pose it and sculpt it in Mudbox.

Chapter 7, “Working with 3D Scan Data,” is the final sculpting chapter. Here you will learn how to import a 3D scan of a human head into the software and run through the workflow of further sculpting it.

Chapter 8, “3D Painting,” focuses on the second core capability of Mudbox: painting. You will learn more about the paint tools in Mudbox while painting the model you created in Chapter 6.

Chapter 9, “Lighting and Rendering,” provides you with in-depth information on how to use the lights in Mudbox in addition to the viewport filters, which enhance the

presentation of the model you are working on. The chapter also covers how to export images of your work and composite them in Photoshop, and how to export your model and textures to render it with mental ray in Maya and in KeyShot.

The Companion DVD

The companion DVD includes all the files in the lessons saved at several stages along the process. It is organized by folders for the nine chapters, in addition to a Stamps folder, a Stencils folder, and a 3D Primitives folder that contain 2D images and objects you can use for the lessons or future projects. Some chapters include a Videos folder that has movies of some of the lessons and some bonus movies related to the topic of the chapter. All the video files were recorded using TechSmith Camtasia using the H.264 codec. Because Mudbox scene files tend to get big when you subdivide a model into multimillion polygons, we have compressed the chapters as zip files. You can use tools such as WinZip or 7-Zip to uncompress these files. Please copy and uncompress the contents of the chapter you are working on from the DVD onto your hard drive before proceeding with the exercises. The head scan model on the DVD is provided by Icon Imaging. The Bertie robot model on the DVD is based on paintings and comic books by Ashley Wood. Both models are to be used for education purposes only. Commercial use is not allowed.

Essential Mudbox and Digital Sculpting Resources

The most essential resource of all is the community website built right into the software under the Mudbox Community tab. There you will find tutorial videos to take you beyond the offerings of this book, and demonstrate the work styles and tips and tricks of talented artists.

Another useful resource is the Autodesk AREA website (<http://area.autodesk.com>), which is a superset of what is included within the Community tab in Mudbox covering some of the other Autodesk products such as Maya, 3ds Max, and Softimage.

It is impossible to talk about Mudbox without mentioning Wayne Robson and his community website, Mudbox Hub (mudboxhub.com). Here you can find additional tutorials, a forum dedicated to Mudbox, and some useful plug-ins.

It is also impossible to talk about Mudbox without mentioning PixelCG and Ashraf Aiad's blog (www.pixelcg.com/blog). Here you can find some indispensable tutorials on Mudbox, as well as the extremely useful process of adding the environment variable to disable LZW compression on .tif files saved out of Mudbox to be used in mental ray.

Another thriving and excellent community for digital sculptors is ZBrush Central (www.zbrushcentral.com). Although it is mainly aimed at ZBrush users, you can find some excellent techniques and inspiration from expert and seasoned digital sculptors.

As for resources on art and sculpting, there are too many to mention in this section, but I will list a few that I have within arm's reach at all times for reference and inspiration.

Anatomy Essentials

- *Modeling and Sculpting the Human Figure* by Edouard Lanteri (Dover Publications, 1985)
- Female and male anatomy reference figures from www.AnatomyTools.com

Lighting and Rendering

- *Digital Lighting & Rendering, Second Edition* by Jeremy Birn (New Riders, 2006)
- *Lighting & Rendering in Maya: Lights and Shadows* DVD by Jeremy Birn

Online Learning and DVDs

- Gnomon Workshop online and DVD training at www.thegnomonworkshop.com

How to Contact the Author

I would love feedback from you regarding the content in this book, or future titles and topics you would like to see. Please feel free to contact me at kermaco@live.com. For more information about me or my work, visit www.kermaco.com.

Sybex strives to keep you supplied with the latest tools and information you need for your work. Please check their website at www.sybex.com or the website for this book at www.sybex.com/go/intromudbox, where we'll post additional content and updates that supplement this book should the need arise.

Thank you for your support in purchasing this book. It has been a great adventure writing it and figuring out relevant exercises for you to understand the foundation concepts and the workings of Mudbox 2011. When I set out to learn Mudbox, there were no books on it. I hope that I have bridged that gap for you in a way that is helpful, and that the content builds a good foundation for you to create your artwork by using the amazing capabilities that the developers of Mudbox have put in our hands.

Getting Your Feet in the Mud: The Basics of the Mudbox Production Pipeline

Digital sculpting and 3D painting software is a relatively recent and significant milestone in computer graphics imagery (CGI). Audiences expect more and more from special effects that suspend their disbelief when the most extreme visions of an author's imagination are brought to visual reality. As movie directors and game designers push the envelope to meet the demands of the market, tools such as Mudbox are becoming a requirement in every visual effects production pipeline.

Mudbox is a sophisticated digital sculpting and painting software package that lets artists sculpt and paint digital models using software as their modeling clay or paint-brush. Mudbox enables you to create the realistic and detailed characters, props, vehicles, and sets that satisfy the audience's expectations. The artists' imagination and creativity are fast becoming the only limits to what they can show their audience.

This is the most important chapter in the book because it introduces all the concepts and stages models go through in the production pipeline. After learning this pipeline and the concepts, you will be ready to delve into the rest of the book, so make sure you are comfortable with this chapter's contents, even if you have to go back through the steps before moving on.

This chapter includes the following topics:

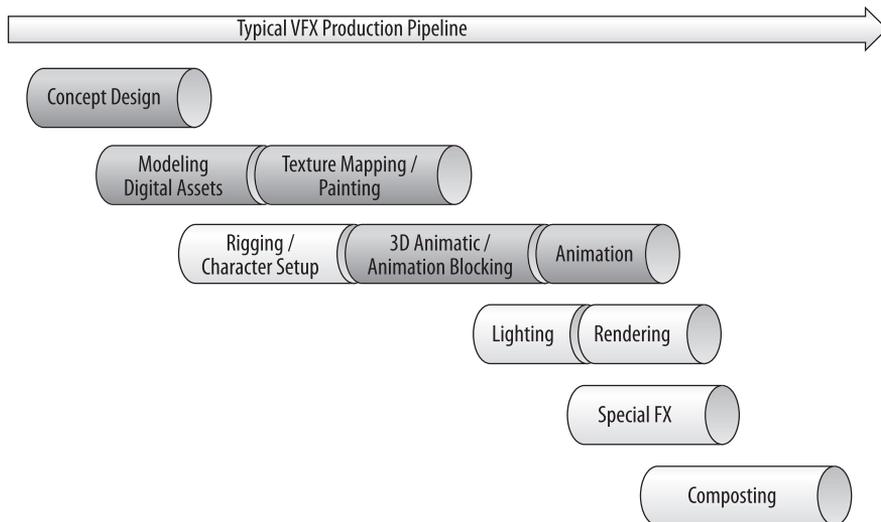
- **Understanding the Mudbox workflow stages**
- **Loading a base mesh**
- **Using the camera to navigate your scene**
- **Blocking in the general shape and adding image planes**
- **Sculpting your model**
- **Adding paint layers and painting your model**
- **Rendering your image in Mudbox**
- **Exporting the results from Mudbox**
- **Rendering your image in Maya**

Understanding the Mudbox Workflow Stages

Mudbox is used throughout the multiple stages of a production pipeline (Figure 1.1). It is used for speed-sculpting concept designs, digital sculpting art assets such as characters, sets and props, painting models, sculpting blend shapes for animation, and projection painting environments. Although these seem like completely different stages, the Mudbox work is fairly similar, so as you get a good grasp of what the software can do, you can apply it to any of the stages in the pipeline, or come up with completely new areas where Mudbox could help your project.

Figure 1.1

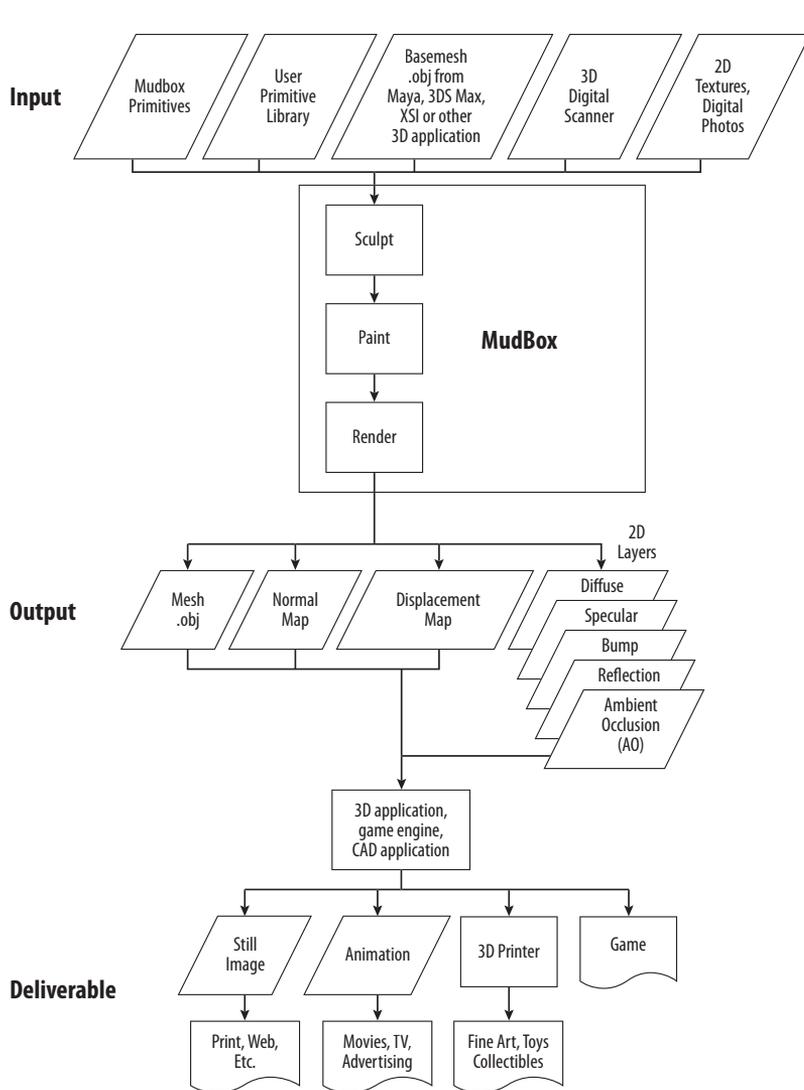
Typical workflow stages of a visual effects (VFX) production pipeline; the darker sections indicate where Mudbox could be used



Mudbox can be used as a stand-alone application, enabling a user to start with one of the provided primitives and end up with a final render of a sculpture. However, most artists use it in a production pipeline in which inputs flow into the program, and outputs flow out to 3D and 2D applications. The data flowchart (Figure 1.2) demonstrates this sequence.

The starting point of Mudbox is a model. This model can be one of the provided Mudbox starter meshes, or a primitive or base mesh model you generate in a 3D program such as Maya, or a scan from 3D digital scanner. You can also import 2D images to use as textures, stamps, or stencils.

In Mudbox, you pose, sculpt, and detail the geometry of the model, and then use the 3D painting capabilities to texture and paint it. Mudbox includes some rendering capabilities—such as lighting based on high dynamic range imaging (HDRI) and ambient occlusion (AO)—which give you a good idea of what your model will look like when output to an external renderer.



After you are finished with your model in Mudbox, you will output the following files:

- A lower-subdivision-level version of your sculpted model, which has polygon counts that the intended 3D application or game engine can support. These models have the overall shape of your final sculpture but lack the detail. These are exported as .obj or .fbx files.
- Two-dimensional images, called *normal* and *displacement maps*, to wrap around the lower-resolution version of your model that you exported as an .obj or .fbx file. These 2D images give the illusion of the detail you had on the high-subdivision-level,

high-polygon-count sculpture but require significantly less computing resources to render and animate.

- Two-dimensional images of all the paint layers that you painted your sculpture with, to composite onto your final deliverable.

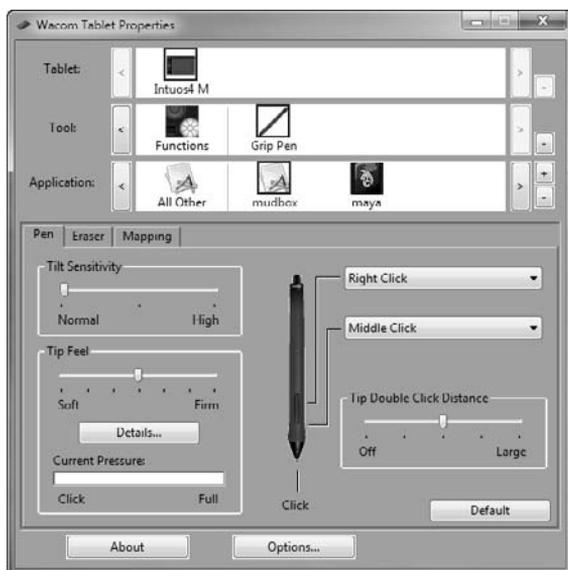
Before moving to the next stages, I recommend you take some time to go through the five one-minute movies that come with Mudbox. You can find them on the Welcome screen that comes up when you launch Mudbox. If you closed this screen, you can also access the movies through Help → Learning Movies, which brings up a Welcome screen for you to click on the movies. These movies will get you started with Mudbox by showing you how to navigate with a mouse or a tablet, and how to paint and pose.

I can't stress how important and indispensable a tablet is for digital sculpting and 3D painting in Mudbox. Even though it is possible to do the lessons with a mouse, it will be extremely tedious if not impossible to get good results. Tablets come with varying capabilities and sizes. Some come with a display that you can directly draw and sculpt on, others are wireless, and some have more sensitivity levels. I use the medium-size Intuos4 tablet from Wacom.

I will go through how to set up and optimize settings for the tablet in Mudbox, but for now, just make sure your tablet stylus buttons are set to Middle Click for the front button and Right Click for the back button. To do this for Wacom tablets, make sure Mudbox is running, open the Wacom control panel (Figure 1.3), and follow these steps:

1. Near the top of the dialog box, click the plus sign to the right of Application.
2. Click Mudbox and then click OK. Notice that Mudbox is added to your application list and has a highlight around it, indicating that it is selected.

Figure 1.3
Tablet control panel



3. Make sure you are on the Pen tab. Click the drop-down menu that is mapped to the back button and choose Clicks → Right Click.
4. Click the drop-down menu for the front button on the stylus and choose Clicks → Middle Click.
5. Close the Wacom control panel.

If you are using a tablet, henceforth in this book, substitute a tap of the stylus for clicking the left button of the mouse, a tap of the forward button on the stylus for clicking the middle button of the mouse, and a tap of the back button on the stylus for clicking the right button on the mouse. Tap the stylus and drag on the surface of the tablet to substitute left-clicking and dragging the mouse.

In the rest of this chapter, you will go through the Mudbox pipeline to produce a realistic-looking egg.

Loading a Base Mesh

A *base mesh*, or *cage* as it is sometimes referred to, is a 3D polygonal object that has been modeled in a 3D application and saved or exported as an .obj file.

To paint this model, we need to unwrap it into 2D before we bring it into Mudbox. If an object has been unwrapped and has UV coordinates associated with it, the UV information will be included in the .obj or .fbx file. Chapters 3, 4, 5, and 6 explain in depth what UVs are and how to generate them. For the examples in this chapter, where needed, the UVs are done and provided for you.

To load your base mesh into Mudbox, follow these steps:

1. Load Mudbox.
2. Close the Welcome screen by clicking the Close button.
3. Choose File → Import.
4. Open the bertie_low.obj file in the Chapter 1\Bertie folder on your DVD.

THE ART OF ASHLEY WOOD

Bertie is a robot that can be found in Ashley Wood's paintings and graphic novels. I have been inspired by Ashley's work over the years and thought Bertie would be a perfect subject for sculpting details and 3D painting because of the bold shapes and amazing aesthetic of the robot. You will be working more with Bertie in Chapter 3, "Detail-Sculpting an Imported Model," and Chapter 4, "Painting and Texturing an Imported Model." To see more of Ashley's work, go to his website at www.ashleywoodartist.com. (Please note that the Bertie images, and Bertie Maya and Mudbox models on the DVD are provided for your personal education only, and not for use in any commercial projects.)

Using the Camera to Navigate Your Scene

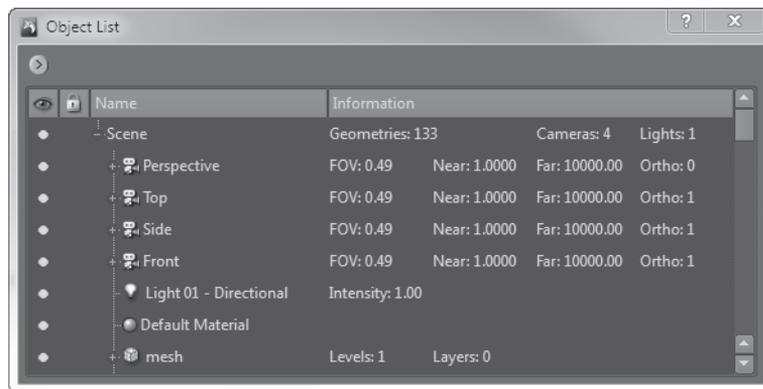
Now that the base mesh is in Mudbox, you can look at it from any angle and zoom in and out to enlarge areas you will be working on in depth. When you are performing the following actions, you are not moving the object but rather the camera through which you are looking at the object. This is similar to framing, let's say, a statue in a museum, in the viewport of a point-and-shoot digital camera. You point your camera at the statue, and walk around it while using the zoom features to perfectly frame the feature you wish to capture in the camera's display viewport before taking the snapshot. Becoming comfortable with navigating the camera is critical to your workflow. Practice as long as you need to, until you are comfortable getting to the area you need to manipulate with minimal steps.

To work with the camera, follow these steps:

1. Press and hold down Alt and tap and drag your stylus tip on the tablet to tumble or spin the model; with a mouse, hold Alt while left-clicking and dragging.

2. To pan, press and hold down the Alt key and the forward button on your stylus, and hover the stylus over the tablet without touching it. The equivalent movement with a mouse is holding Alt while middle-clicking and dragging.
3. To zoom in and out of your model, press and hold down the Alt key and the back button on the stylus, and hover the stylus over the tablet without touching it. The equivalent movement with a mouse is holding Alt while right-clicking and dragging.
4. Press W to show or hide the wireframe on the model.
5. To focus on a specific area, point to it with the cursor and press the F key on your keyboard. Now tumble around as you did in step 1, as you can see the center of your rotation is now your focus point. This is a handy way to set the focus on your work area.
6. To see all of your model, press the A key.
7. From the Window menu, choose Object List (see Figure 1.4). The Object List shows you all the cameras, lights, objects, and materials in your scene.

Figure 1.4
Object List



8. Notice that you have four default cameras already available to you. If you use other 3D applications, you are usually looking at your object in four views (Figure 1.5). In Mudbox, you work in only one viewport. You can switch from one camera to another by right-clicking the appropriate camera with your mouse, or by pressing the back button on your stylus, and selecting Look Through from the drop-down menu. Look through all four cameras.
9. Notice that as you select a camera, the properties of that camera are displayed below the Object List in the Properties tray (Figure 1.6).

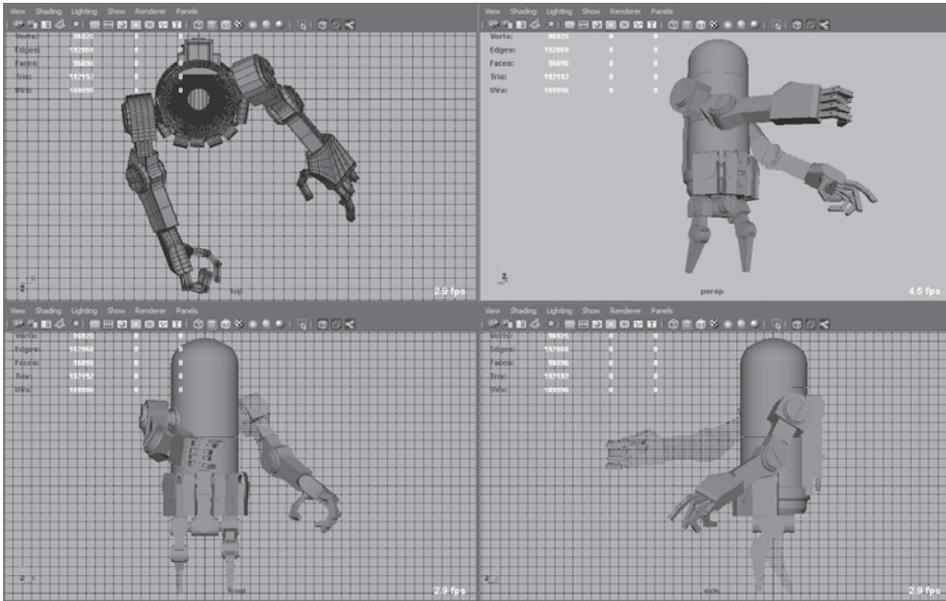


Figure 1.5
Four viewports as seen in Maya

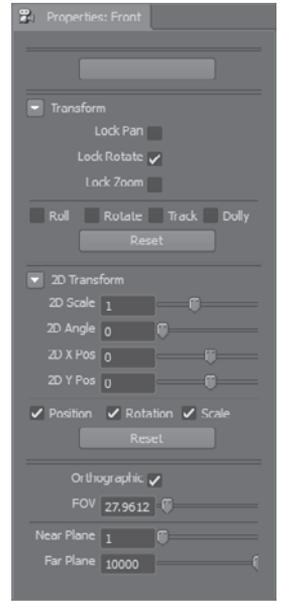
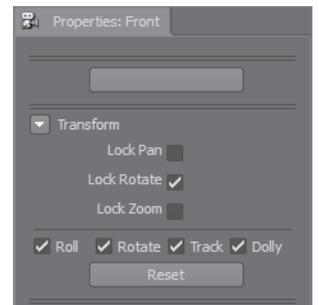


Figure 1.6
Camera properties

10. Look through the Front camera. Use the navigation methods I explained earlier to move around your model. Now look through the Top camera. Look through the Front camera again. You will notice that you are not looking at the model in the front view, but the view you actually left your model in. To get the camera to snap back to the front view, in the Transform properties of the camera, select the Roll, Rotate, Track, and Dolly check boxes and click the Reset button (Figure 1.7). This reverts your model to the original front view.
11. Note that there are three lock options in the Transform properties of your camera: Lock Pan, Lock Rotate, and Lock Zoom. When you want to restrict any of the three transform capabilities of the camera either for convenience or because you have attained a desirable camera view state, you can lock the change in the camera position, orientation, and magnification by choosing one, two, or three of these options. Note that the Front, Side, and Top cameras have the Orthographic option selected by default, which means they do not show your objects with any perspective depth. Experiment by navigating around your model with these options to get an idea of how they work.

Figure 1.7
Resetting the camera view



WORKPLACE HINT

When I sculpt, I usually bring up a second Object List window (by choosing Window → Object List) that I can move anywhere on the screen. I usually have this second Object List either on my second monitor or somewhere on my first monitor but out of the way of my sculpting. I then make sure the Lock Rotate option on all three of the Front, Side, and Top cameras is selected, which it should be by default, unless they were changed in a prior session. This helps me not to confuse the camera I am looking through, and even if I pan and zoom the camera, I am still looking at the model in the view that corresponds to the name of the camera.

You have now navigated the 3D view with your tablet or mouse and the Alt key. The introductory movies in the Welcome screen give an excellent demonstration on how to do this. Table 1.1 is a cheat sheet to get you started, but this will become second nature for you after your first few sessions.

Table 1.1
Navigating with the
Mouse and Tablet

ACTION	TABLET	MOUSE
Tumble or spin	Alt + click down and drag stylus	Alt + left-click and drag mouse
Pan or track	Alt + forward button and drag stylus	Alt + middle-click and drag mouse
Dolly or zoom	Alt + back button and drag stylus	Alt + right-click and drag mouse

- To focus on an area on your model, move your cursor to it and press the F key.
- To see all of your model, press the A key. This repositions the camera so all the visible geometry is in the 3D view.

Blocking in the General Shape and Adding Image Planes

Now that you know how to navigate the camera around your model, you will go through the entire Mudbox pipeline with a simple example of an egg. You will start with a primitive sphere and then shape it into an egg. You'll then sculpt the eggshell and paint it. Finally, you'll output displacement, normal, and texture maps to Maya and use mental ray to do a final render of the model.

You can follow these instructions step by step, or watch the movies of this project in the Chapter 1\videos folder of the DVD. These videos are divided as follows, based on the four stages in the chapter:

1. Blocking in shape: Chapter1-part1.mov
2. Subdivide and sculpt: Chapter1-part2.mov
3. Paint and render: Chapter1-part3.mov
4. Export and render in Maya: Chapter1-part4.mov