

Paul Gaboury

ZBrush®

PROFESSIONAL
TIPS + TECHNIQUES



Foreword by Rick Baker

Seven-Time Academy Award Winner for Best Makeup

 SYBEX

SERIOUS SKILLS.

Table of Contents

[Cover](#)

[Title Page](#)

[Copyright](#)

[Publisher's Letter](#)

[Dedication](#)

[Acknowledgments](#)

[About the Author](#)

[Foreword](#)

[Introduction](#)

[Chapter 1: Understanding the Basics](#)

[Customizing Your ZBrush](#)

[Recovering Your Subdivision Levels](#)

[Using Reproject Higher Subdivision](#)

[Using Relax Deformation](#)

[Creating a Custom Tileable Alpha with 2.5D](#)

[Using Alphas to Create Meshes](#)

[Creating Wallpaper](#)

[Creating Your Own Palette](#)

[What's Next](#)

[Artist Spotlight: Joe Lee](#)

[Artist Spotlight: Magdalena Dadela](#)

[Chapter 2: Special Project—Creating Accessories for a Bust](#)

[Creating the ZMan Logo](#)

[Creating the Zipper](#)

[Creating the Stand](#)

[Creating a Skin Texture](#)

[What's Next](#)

[Artist Spotlight: Morgan Morey](#)

[Artist Spotlight: Zack Petroc](#)

[Chapter 3: Sculpting—Developing Your Next Piece](#)

[Using Hard-Edge Brush Techniques](#)

[Adjusting and Creating Brushes](#)

[Understanding the Power of ShadowBox](#)

[Making Difficult Items with ZSpheres](#)

[Using Morph Difference to Create Thickness](#)

[Artist Spotlight: Tomas Wittelsbach](#)

[Artist Spotlight: Vitaly Bulgarov](#)

[Chapter 4: Sculpting Hard-Surface Details](#)

[Creating a Hose Component](#)

[Creating the Front Eye Piece](#)

[*Using NoiseMaker for Patterns*](#)

[*Artist Spotlight: Sebastien Legrain*](#)

[*Artist Spotlight: Steve Warner*](#)

[**Chapter 5: Adding a Splash of Color**](#)

[*Understanding the Basics of Polypaint*](#)

[*Using AO to Colorize*](#)

[*Using Mask By Cavity to Paint Out Detail*](#)

[*Painting with UV Master*](#)

[*Texturing with Projection Master*](#)

[*Using Photoshop to Paint*](#)

[*Using SpotLight*](#)

[*Artist Spotlight: Michael Defeo*](#)

[*Artist Spotlight: Rudy Massar*](#)

[**Chapter 6: Working with Scan Data**](#)

[*Starting with Scan Data*](#)

[*Understanding How to Manipulate Scan Data*](#)

[*Capturing Color from the Scan Data*](#)

[*Making the Back Mesh of the Ball Cap*](#)

[*Sculpting the Hair with FiberMesh*](#)

[*Artist Spotlight: Mike Jensen*](#)

[*Artist Spotlight: Bryan Wynia*](#)

[**Chapter 7: Posing—Bringing Movement to Your Work**](#)

[*Setting Up a ZSphere Rig with a Single Subtool*](#)

[Rigging a Single Subtool with Sculpted Detail](#)

[Using a Rig with Transpose Master](#)

[Creating Multiple Poses with Layers](#)

[Assigning Multiple Poses to the Timeline](#)

[Exporting Blend Shapes from ZBrush to Maya](#)

[Artist Spotlight: Geert Melis](#)

[Artist Spotlight: Marco Menco](#)

[Chapter 8: Special Project—Creating Hockey Skates](#)

[Creating the Laces](#)

[Using a Custom Stitch Brush](#)

[Using Decimation Master to Reduce Poly Count](#)

[Artist Spotlight: Joseph Drust](#)

[Artist Spotlight: Christopher Brändström](#)

[Chapter 9: Rendering—Bringing Life to Your Image](#)

[Rendering a More Realistic Eye](#)

[Adjusting the Shadow Settings](#)

[Creating an SSS Material](#)

[Using the Filter System with BPR](#)

[Artist Spotlight: Mark Dedecker](#)

[Artist Spotlight: Julian Kenning](#)

[Appendix: About the Companion DVD](#)

What You'll Find on the DVD

System Requirements

Using the DVD

Troubleshooting

Customer Care

Index

**Wiley Publishing, Inc. End-User
License Agreement**

ZBrush® Professional Tips and Techniques

Paul Gaboury



John Wiley & Sons, Inc.

Acquisitions Editor: Mariann Barsolo
Development Editor: Stephanie Barton
Technical Editor: Eric Keller
Production Editor: Christine O'Connor
Copy Editor: Sharon Wilkey
Editorial Manager: Pete Gaughan
Production Manager: Tim Tate
Vice President and Executive Group Publisher: Richard Swadley
Vice President and Publisher: Neil Edde
Media Producing Supervisor: Rich Graves
Media Associate Producer: Doug Kuhn
Media Quality Assurance: Josh Frank
Book Designer: Mark Ong, Side by Side Solutions
Compositor: Chris Gillespie, Happenstance Type-O-Rama
Proofreader: Louise Watson, Word One New York
Indexer: Robert Swanson
Project Coordinator, Cover: Katherine Crocker
Cover Designer: Ryan Sneed
Cover Image: Paul Gaboury

Copyright © 2012 by John Wiley & Sons, Inc.,
Indianapolis, Indiana

Published simultaneously in Canada

ISBN: 978-1-118-06680-5

ISBN: 978-1-118-22238-6 (ebk.)

ISBN: 978-1-118-23633-8 (ebk.)

ISBN: 978-1-118-26102-6 (ebk.)

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the

Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at <http://www.wiley.com/go/permissions>.

Limit of Liability/Disclaimer of Warranty: The publisher and the author make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation warranties of fitness for a particular purpose. No warranty may be created or extended by sales or promotional materials. The advice and strategies contained herein may not be suitable for every situation. This work is sold with the understanding that the publisher is not engaged in rendering legal, accounting, or other professional services. If professional assistance is required, the services of a competent professional person should be sought. Neither the publisher nor the author shall be liable for damages arising herefrom. The fact that an organization or Web site is referred to in this work as a citation and/or a potential source of further information does not mean that the author or the publisher endorses the information the organization or Web site may provide or recommendations it may make. Further, readers should be aware that Internet Web sites listed in this work may have changed or disappeared between when this work was written and when it is read.

For general information on our other products and services or to obtain technical support, please contact our Customer Care Department within the U.S. at (877)

762-2974, outside the U.S. at (317) 572-3993 or fax (317) 572-4002.

Wiley publishes in a variety of print and electronic formats and by print-on-demand. Some material included with standard print versions of this book may not be included in e-books or in print-on-demand. If this book refers to media such as a CD or DVD that is not included in the version you purchased, you may download this material at <http://booksupport.wiley.com>. For more information about Wiley products, visit www.wiley.com.

Library of Congress Control Number: 2012936811

TRADEMARKS: Wiley, the Wiley logo, and the Sybex logo are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates, in the United States and other countries, and may not be used without written permission. ZBrush is a registered trademark of Pixologic, Inc. All other trademarks are the property of their respective owners. John Wiley & Sons, Inc. is not associated with any product or vendor mentioned in this book.

10 9 8 7 6 5 4 3 2 1

Dear Reader,

Thank you for choosing *ZBrush® Professional Tips and Techniques*. This book is part of a family of premium-quality Sybex books, all of which are written by outstanding authors who combine practical experience with a gift for teaching.

Sybex was founded in 1976. More than 30 years later, we're still committed to producing consistently exceptional books. With each of our titles, we're working hard to set a new standard for the industry. From the paper we print on to the authors we work with, our goal is to bring you the best books available.

I hope you see all that reflected in these pages. I'd be very interested to hear your comments and get your feedback on how we're doing. Feel free to let me know what you think about this or any other Sybex book by sending me an email at nedde@wiley.com. If you think you've found a technical error in this book, please visit <http://sybex.custhelp.com>. Customer feedback is critical to our efforts at Sybex.

Best regards,

A handwritten signature in black ink, appearing to read 'Neil Edde', written in a cursive style.

Neil Edde

Vice President and Publisher

Sybex, an Imprint of Wiley

This book is dedicated to Jim and Helen Cook. Without your support, I would never have had the opportunity to write this book; thank you so much.

Acknowledgments

I'm so excited to provide this book to all who enjoy creating art in ZBrush. This book would never have been possible without the amazing ZBrush community. Thank you for always inspiring me and pushing me to keep experimenting to improve my artistic journey. I would also like to thank all the ZBrush artists I have met over the years for their willingness to share their work, thoughts, and techniques with me.

Thank you to my colleagues at Pixologic for all the support you have given me over the years. I could not imagine developing ZBrush without you. I would especially like to thank Jaime Labelle and Ofer Alon for the continued support during the writing of this book. Thank you to all the artists who contributed to this book, burning the midnight oil to create the amazing tips for all of us to learn from. I can't thank you enough for taking your free time to help contribute to this book: Magdalena Dadela, Joe Lee, Zack Petroc, Morgan Morey, Tomas Wittelsbach, Sebastien Legrain, Michael Defeo, Rudy Massar, Mike Jensen, Marco Menco, Joseph Drust, Vitaly Bulgarov, Steve Warner, Bryan Wynia, Geert Melis, Christopher Brändström, Mark Dedecker, and Julian Kenning.

Thank you to all the editors and the Sybex team for making this book possible and for helping to put this book together: Mariann Barsolo, Stephanie Barton, Christine O'Connor, and Pete Gaughan. I cannot give enough appreciation to the technical editor, Eric Keller, for being so honest throughout the process. This book would not be what it is without your advice.

To all my family in the areas of Stevensville, Ontario, Canada, and Buffalo, New York, thanks for allowing me to

be that loud and crazy kid growing up. I would not be the person I am today without all of you. To my mother, Mindy, my father, David, my stepmother, Janette, and my sister, Tammy: thank you for all the support you gave me to realize my dreams and accomplish my goals, some of which are still to come. I cannot tell you how much the four of you have influenced my life.

To the love of my life, Cali, there is no way this book would have happened without you. Thank you for being there to advise me, push me, and continue providing that loving support. I enjoyed working those long nights together. You will always keep me inspired to discover art.

About the Author

Paul Gaboury is the lead application engineer for Pixologic, the makers of ZBrush. Paul is involved with the development of ZBrush and works with artists around the world offering support on ZBrush and Sculpttris. Paul has been working with CG software since 2001. He has worked with several studios such as Legacy Effects, Walt Disney Animation Studios, Pixar Animation Studios, Industrial Light & Magic, and many more, enhancing their ZBrush sculpting pipeline and providing training and development, and giving demos and support to all the artists in the studio. As part of the Pixologic team, Paul also travels to various schools giving demos on ZBrush and works with the institutions' instructors to build and establish a ZBrush curriculum.

Paul graduated with a BFA from Bowling Green State University and was an extension student at Gnomon School of Visual Effects.

A fantastic group of ZBrush artists contributed their expertise to this book. Please see the Artist Spotlight features in each chapter for the individual biographies of these extremely creative people.

Foreword

My name is Rick Baker, and I am a ZBrushaholic. That's right—I am addicted to ZBrush.

If you don't want to be addicted to ZBrush, you must put this book down immediately and run away. If you don't take my advice and you read Paul's *ZBrush® Professional Tips and Techniques* book, I would be willing to bet that you, too, will become addicted.

My life just hasn't been the same since I became a ZBrush addict. I am constantly enjoying sculpting crazy creatures on my computer.

I didn't think it could happen to me. When computer modeling first started, I thought that I would give it a try, but modeling with points and polygons just wasn't for me. It was so foreign—I couldn't make anything organic-looking. No way I was going to get hooked on this computer stuff; nope, I'll stick with my real-world sculpting. But then along came ZBrush. I have been hooked ever since. It was so much like real-world sculpting—only better, faster, and way more fun.

So take my advice: if you, too, want the ZBrush addiction, this book will definitely give you what you're looking for. It's filled with dozens of tips and insights to feed your addiction, including how to create a Subsurface Scattering SSS material in Chapter 9 and a cool walk-through of creating hair with FiberMesh in Chapter 6. You will spend every free moment on your computer sculpting, painting, and having a blast making all sorts of amazing things.

You were warned.

Sincerely,
Rick Baker

As a teen, Rick Baker began creating artificial body parts in his own kitchen. One of the earlier films Rick worked on was as an assistant to Dick Smith on . Baker's most recent work can be seen in MIB3.

Introduction

Welcome to *ZBrush® Professional Tips and Techniques* and the world of digital sculpting. During my years of traveling in and out of studios, schools, medical institutions, conferences, and many other industries, I found myself speaking with artists about various techniques and how certain features of ZBrush work to improve pipelines. I discovered that there was always more than one way to create something in ZBrush, but there was not one good location to learn all the techniques.

I wrote this book with the hope of sharing the many tips and techniques I gathered from these presentations with the community, to inspire you to discover new ideas on how to use ZBrush.

Because ZBrush is so powerful, it can be hard to figure out the necessary steps to accomplish specific sculpts. In this book, you will find various techniques that can be applied to several industries. Artist Spotlights feature ZBrush specialists from various markets, including film, games, jewelry, and education. You will also find chapters dedicated to sculpting, texturing, rendering, and much more. The book also contains Special Projects, which provide a final image of a sculpt and share a step-by-step tutorial on how parts of the image were accomplished.

Finally, my hope is that these techniques will get you to start thinking about how you can change your workflow in ZBrush and give you a great base to expand from to continue your journey in digital sculpting.

Who Should Read This Book

This book is meant primarily for artists who have been using ZBrush for a while and have a basic knowledge of the program. However, there are definitely techniques in here that will be invaluable to beginners. At least, I wish I'd known some of this stuff when I started using ZBrush more than six years ago.

In addition, this book is great to accompany any curriculum at any institution as a resource for ZBrush workflows. This is also a great resource for any self-taught artist trying to learn more about how ZBrush can be used in different industries. Finally, this book is great for artists making the transition from clay sculpting to digital, from Photoshop to 3D, from traditional 3D packages to digital sculpting, and for artists who are just looking to use the computer as a new medium.

What You Will Learn

In *ZBrush® Professional Tips and Techniques*, I will show you how you can use ZBrush to create several workflows by combining various tools to accomplish a final image or sculpt that will be rapid-prototyped out. This book is full of step-by-step tutorials and completed images in ZBrush.

You will learn several tips that extend beyond the basics of ZBrush: sculpting techniques, texturing, rendering, posing, hard-edge sculpting, creating hair, and so much more. This book is also chock-full of tips from ZBrush artists sharing workflows that they use every day at their studios.

After you finish this book, you will have an arsenal of knowledge for ZBrush, giving you a solid foundation to expand your art in creating more realistic CG images and animations.

The goal of this book is to provide you with tips and techniques to make you more familiar with all the parts of

ZBrush and combine those elements into your own workflow.

Hardware and Software Requirements

Computers are always changing, and ZBrush has grown with these changes. It can run on two operating systems (Windows XP/Vista/7 and Mac OS X 10.5 or newer), but figuring out your hardware can be more involved. This book also includes a DVD full of assets that will require you to have at least ZBrush 4R2b to open all tools and projects found on the DVD. You will also need to have QuickTime or VLC player to play all videos found on the DVD.

For hardware, ZBrush really relies only on your RAM and processor. Because it's not an OpenGL application, the video card has no real effect on performance. ZBrush doesn't need much to run, but I recommend a minimum of 4 GB of RAM and a dual-core processor. For best results in ZBrush, you should install 8 GB of RAM and get the best processor you can afford or even two processors. ZBrush is currently a 32-bit application, but Pixologic has announced that future versions of ZBrush will be 64-bit; I would install 12 GB of RAM or more to take full advantage of this version when it arrives.

Even though at the time of this book's release, ZBrush 4R2b was still a 32-bit application, I still recommend having a 64-bit operating system so that ZBrush can use up to 4 GB of RAM on the Windows side and at least 3.5 GB of RAM on the Mac side.

ZBrush offers a free upgrade to all registered users; therefore, this book was written primarily with ZBrush 4R2b but also includes tips for ZBrush4R3. For many of

these tips and techniques, you will need at least ZBrush 4R2b. To learn more about the most current ZBrush system requirements, visit the Pixologic website:

www.pixologic.com/zbrush/system/

How to Use This Book

This book was designed with a particular workflow. This book is set up so that each odd-numbered chapter focuses on a specific area of ZBrush and includes Artist Spotlights offering tips from two artists representing different industries. Each even-numbered chapter presents a Special Project of one of my sculpts and includes two more Artist Spotlights.

Chapter 1, “Understanding the Basics,” gives you some basic tips on sculpting, painting, creating base meshes, and much more. This chapter is not only great for beginners but also has some great tips for any level of ZBrush user. This chapter includes Artist Spotlights from Magdalena Dadela and Joe Lee.

Chapter 2, “Special Project—Creating Accessories for a Bust,” will give you four tips from my sculpt of a bust I created to be tested for a rapid-prototype. There are tips on creating a logo, creating a zipper, creating a base of the chess piece, and sculpting skin. This chapter includes Artist Spotlights from Zack Petroc and Morgan Morey.

Chapter 3, “Sculpting—Developing Your Next Piece,” covers some really cool techniques for improving your sculpting in ZBrush. These include hard-edge techniques, creating a brush, using ZSpheres and ShadowBox, and using a morph target. This chapter includes Artist Spotlights from Tomas Wittelsbach and Vitaly Bulgarov.

Chapter 4, “Sculpting Hard-Surface Details,” guides you through several steps on how to create hard-edge components and use the NoiseMaker for patterns. This chapter includes Artist Spotlights from Sebastien Legrain and Steve Warner.

Chapter 5, “Adding a Splash of Color,” covers how you can use ZBrush to paint your sculpts, including the basics of polypainting, Projection Master, and SpotLight; using Photoshop with ZBrush; combining painting with UV Master; and using various masking techniques for painting. This chapter includes Artist Spotlights from Michael Defeo and Rudy Massar.

Chapter 6, “Working with Scan Data,” covers how to use scan data in ZBrush as a great start. This technique is used in several industries including film, games, toys, and collectibles. You’ll learn the basics of scan data manipulation, creating a ball cap for the data, and creating hair with FiberMesh. This chapter includes Artist Spotlights from Mike Jensen and Bryan Wynia.

Chapter 7, “Posing—Bringing Movement to Your Work,” covers how you can use ZSpheres to rig your models, whether you have one subtool or several subtools, and how to take ZBrush layers to Maya as blend shapes. This chapter includes Artist Spotlights from Geert Melis and Marco Menco.

Chapter 8, “Special Project—Creating Hockey Skates,” takes you through two specific techniques on how to create laces, how to create a custom stitch brush, and how to use Decimation Master to maintain a logo. This chapter includes Artist Spotlights from Joseph Drust and Christopher Brändström.

Chapter 9, “Rendering—Bring Life to Your Image,” covers how you can use the BPR render in ZBrush to create more realistic rendered images. You

will learn how to create a multiple shaded material for a Subsurface Scattering SSS render, render out a realistic eye, use the filter system, and understand the shadow controls of the BRP settings. This chapter includes Artist Spotlights from Mark Dedecker and Julian Kenning.

How to Contact the Author

I would love to hear your thoughts about the book, or if you have any questions, please email me at paul.gaboury@gmail.com. In the subject line, please just let me know you are contacting me about the book by putting something like, “I read your book and have a question.” Thank you for picking up this book and for all the support. Above all else, enjoy the reading—and happy ZBrushing.

Chapter 1

Understanding the Basics

This first chapter introduces you to tools and features of ZBrush that you will use constantly throughout your journey. Understanding the powerful core of ZBrush is essential before you dive into more complex procedures. I often notice that the simplest ZBrush features serve as a foundation for the more complex tricks along my workflow.

People often ask me how to become a great sculptor in ZBrush, and my answer is always “Time and effort.” You must put in the time to learn the new art form. However, the effort you expend as you learn is crucial. Use your time to the fullest.

My goal in this book is to encourage you to use new workflows by helping you understand more of ZBrush. This chapter introduces a wave of new features that you can build upon to get better and faster results. I encourage you to open your mind to new techniques and, above all, to have fun doing it.

- Customizing your ZBrush
- Recovering your subdivision levels
- Using Reproject Higher Subdivision
- Using Relax deformation
- Using local subdivision
- Creating a custom tileable alpha with 2.5D
- Using alphas to create meshes
- Creating wallpaper
- Creating your own palette

Customizing Your ZBrush

Before artists can create, they must first understand their tools. ZBrush is constantly changing the way I sculpt, but before I can get to the cool features, I need to set up a comfortable work area. Just like a painter, a ZBrush artist needs to get all his tools in the right locations. Some users prefer the default user interface (UI), but these next few tips will give you the necessary information to set up your very own ZBrush UI.

Customizing Your 3D Brush Fly-Out Window

As a ZBrush artist, you will visit the Brush palette often to switch brushes. The brush fly-out window in [Figure 1-1](#) can be overwhelming. However, you can easily customize it.

Press B on your keyboard to call up the 3D brush fly-out window. Note that the 3D brushes in [Figure 1-1](#) are available only when a tool is in Edit mode. The brush fly-out appears at the current position of the brush icon. Pressing B is the same as clicking the large brush icon in the Brush palette at the top of the interface or clicking the large brush icon on the left of the default ZBrush interface, as shown in [Figure 1-2](#). You can find a list of ZBrush hot keys on the ZBrush wiki at www.pixologic.com/docs/index.php/ZBrush_4_Shortcuts.

[Figure 1-1:](#) 3D brush fly-out window



Figure 1-2: 3D brush icon at the top of the icons



To customize the 3D brush fly-out, follow these steps:

1. Open your Windows Explorer or Mac Finder. Go to the following directory:

Windows = Program Files(x86)\ZBrush4R2b
ZBrush4\ZData\BrushPresets

Mac = Applications\ZBrush05X
ZBrush4R2b 4.0\ZData\BrushPresets

These directories contain all the 3D brushes in the fly-out window. Any brushes you remove will no longer appear in the 3D brush fly-out window. I do *not*

recommend deleting these brushes completely from your system.

2. Move the brushes you do not want to be in the fly-out window into the following directory:

Windows = Program Files(x86)\ZBrush4R2b\ZBrushes

Mac = Applications\ZBrush05X 4.0R2b\ZBrushes

This moves the brushes into LightBox, under the Brush tab.

3. After you remove the brushes from the fly-out window folder, you must restart ZBrush to apply the changes.

Be careful not to delete certain brushes such as the Transpose.ZBP, any brush that starts with Clip, any brush that starts with Mask, SelectLasso.ZBP, SelectRect.ZBP, Smooth.ZBP, or any of the Zsketch brushes, because this will render certain features unusable. If you are unsure, never delete a 3D brush. You can watch the DVD video in the Chapter 1 Assets folder called *Customize Brush Fly-Out* for more details.

Customizing Your LightBox Tabs

LightBox is an internal ZBrush browser that makes it easy to access assets such as 3D brushes, tools, projects, textures, and alphas. [Figure 1-3](#) shows an open LightBox with the Project tab highlighted. This tab displays all projects saved in the ZProjects folder.

Figure 1-3: Default open LightBox with projects highlighted



All LightBox tabs can host several brushes, alphas, textures, and so on. Because you just learned how to