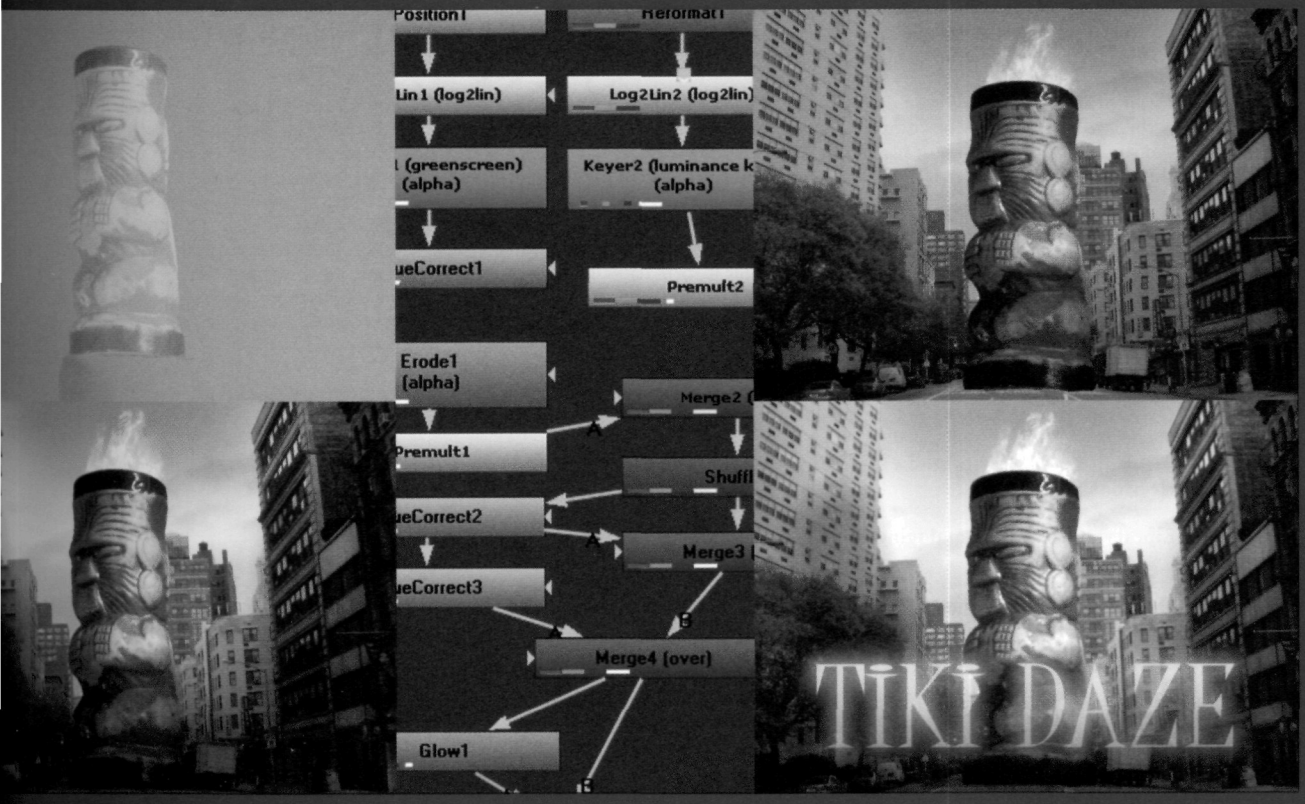
Professional Digital Compositing

Essential Tools and Techniques

Lee Lanier



WILEY
Wiley Publishing, Inc.

Contents

Introduction xv

Chapter 1 Setting Up a Composite 1

Compositing Challenge 2

Compositing Examples 2

Freestyle Collective for Cartoon Network 2

Click 3X for Sharp 4

AILV for Spec Commercial 5

Tonya Smay for Westchester Medical Center 5

Layers vs. Nodes 7

Resolutions and Frame Rates 8

Common Resolutions and Aspect Ratios 9

Common Frame Rates 10

Interlaced vs. Progressive 11

Setting Up a Composite 12

After Effects Projects 12

Nuke Scripts 23

AE and Nuke Tutorials 30

Interview: Dorne Huebler, Industrial Light & Magic, San Francisco 34

Interview: Michael Coleman, Adobe, Seattle, Washington 36

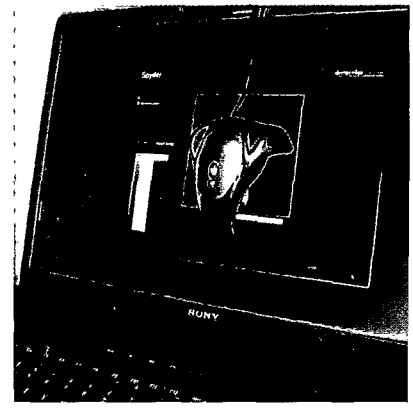
Interview: Richard Shackleton, The Foundry, London 37

Chapter 2 Choosing a Color Space 40

Color Theory Overview 42

RYB and RGB Color Models 42

Employing Color Harmony 43



Color Space and Monitor Calibration 43
Working with Gamma 44
Calibrating a Monitor 45
Understanding Bit Depth 47
Bit Depth Conversions 48
Log vs. Linear 49
Log File Formats 50
White and Black Reference 51
Integer vs. Float 51
Favored Image Formats 52
Working with Color Space 53
Working in AE 53
Working in Nuke 57
Color Space Tutorials 58
Interview: Jason Greenblum, Sony Pictures Imageworks 64
Interview: Rod Basham, Imaginary Forces, Hollywood 66

Chapter 3 Interpreting Alpha and Creating Mattes 68
Alpha Support and Premultiplication 70
Fundamental Math Operations 71
Normal (Over) and Stencil 71
Add (Plus) and Screen 73
Multiply 73
Lighten (Max) and Darken (Min) 74
Chroma Key 74
Bluescreen vs. Greenscreen 75
Common Approaches to Keying 75
Keying Workflow 77
Working with Alpha 78
Alpha in AE 78
Alpha in Nuke 86
AE and Nuke Tutorials 93
Interview: Johnathan R. Banta, Zoic Studios, Culver City, California 103

Chapter 4 Channel Manipulation 106

Histograms and Tonal Ranges 108

Reading Histograms 108

Histogram Tips 109

Tonal Ranges, White Points, and Black Points 109

Working with Channel Manipulation 110

Channel Manipulation in AE 110

Channel Manipulation in Nuke 120

AE and Nuke Tutorials 130

Interview: Andy Davis, Method Studios, Santa Monica, California 139

Chapter 5 Transformations and Keyframing 142

Understanding Transformations 144

Matrix Operations 144

Transformation Order and Concatenation 146

Interpolation Filters 146

Working with Transformations 150

Transformations in AE 150

Transformations in Nuke 156

AE and Nuke Tutorials 161

Interview: Erik Winquist, Weta Digital, Wellington, New Zealand 167

Interview: Darren Poe, Digital Domain, Venice, California 169

Chapter 6 Convolution Filters 172

Filter Matrices 174

Blurring Kernels 174

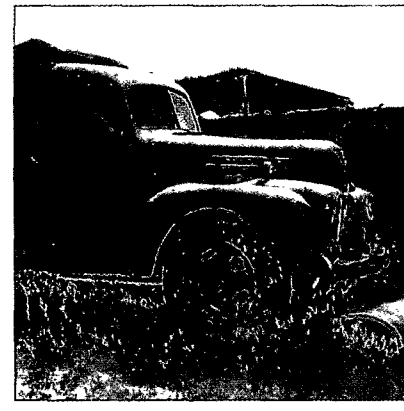
Sharpening Kernels 176

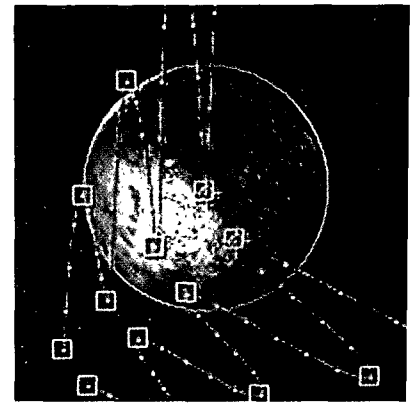
Unsharpening 178

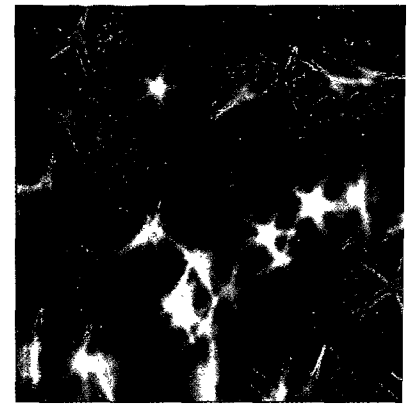
Stylistic Filter Kernels 178

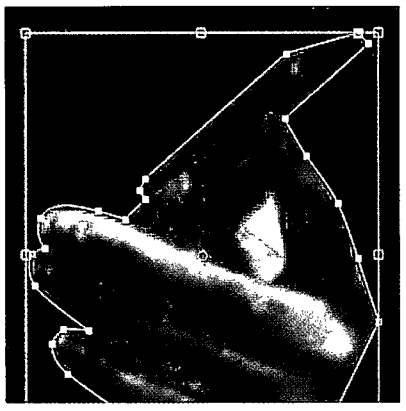
Working with Filters 181

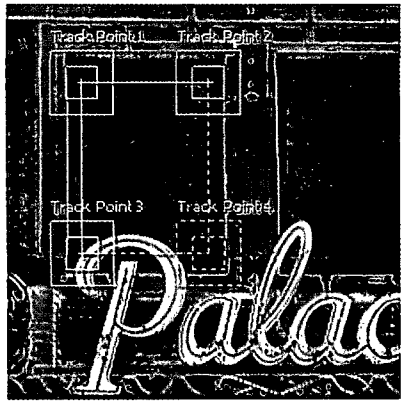
Filter Effects in AE 181

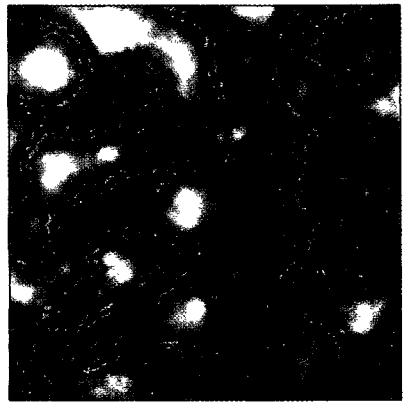












Filter Nodes in Nuke 185
AE and Nuke Tutorials 192
Interview: Alex Lovejoy, The Mill NY, New York City 202

Chapter 7 Masking, Rotoscoping, and Motion Tracking 204

Mattes vs. Masks 206
The History of Rotoscoping 206
Rotoscoping Approaches 207
Bisecting 207
Key Poses 208
Motion Tracking Overview 209
Applying Masking and Tracking Techniques 210
Masking and Tracking in AE 210
Masking and Tracking in Nuke 221
AE and Nuke Tutorials 232
Interview: Entae Kim, Freestyle Collective, New York City 243

Chapter 8 DI, Color Grading, Noise, and Grain 246

Digital Intermediates 248
DI for Film 248
DI for Video and Animation 252
Color Grading without DI 253
Color Grading in AE 253
Color Grading in Nuke 254
3D LUTs in Nuke 255
Noise and Grain 257
Working with Noise and Grain 259
Noise and Grain in AE 259
Noise and Grain in Nuke 263
AE and Nuke Tutorials 267
Interview: Shawn Jones, NT Picture & Sound, Hollywood 275

Chapter 9 Integrating Render Passes 278

Dividing a CG Render 280

Combining Layers 280

Common Render Passes 281

Working with Render Passes 291

Combining Passes in AE 292

Combining Passes in Nuke 294

AE and Nuke Tutorials 300

Interview: Dan Rice, Blur Studio, Venice, California 312

Chapter 10 Warps, Optical Artifacts, Paint, and Text 314

Warping and Morphing 316

Adding Text 316

Adding Optical Artifacts 318

Painting in the Composite 321

Warps, Optical Artifacts, Paint, and Text in AE 322

Warps, Optical Artifacts, Paint, and Text in Nuke 333

AE and Nuke Tutorials 345

Interview: Aron Baxter, Guava / Nice Shoes, New York City 354

Chapter 11 Working with 2.5D and 3D 356

2D vs. 2.5D vs. 3D 358

Multiplaning in the Composite 358

Using 2D Cards and 3D Projections 358

Compositing 2.5D and 3D 361

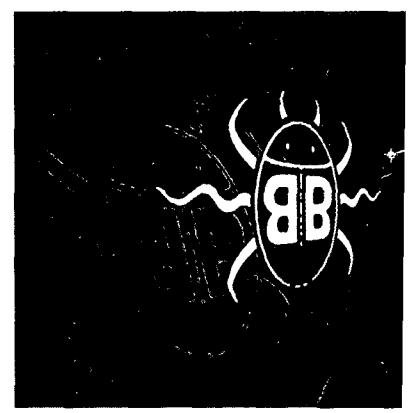
2.5D and 3D in AE 361

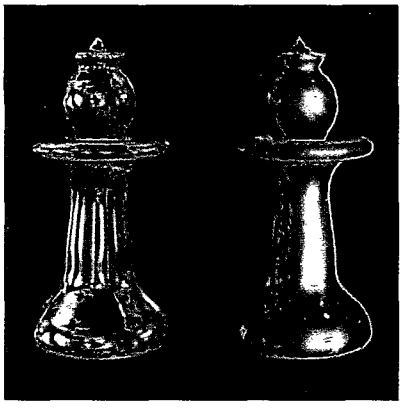
2.5D and 3D in Nuke 368

AE and Nuke Tutorials 384

Interview: David Schnee, Tippett Studio, Berkeley, California 390

Interview: Aaron Vasquez, Click 3X, New York City 392





Chapter 12 Advanced Techniques 394

High Dynamic Range Images 396

HDRI in Visual Effects 397

HDR Formats and Projections 397

Exposure Adjustment and Tone Mapping 398

Stereoscopic 3-D 399

Anaglyphic 3-D 399

Polarized 3-D 400

3-D Projection and Display 400

Recording 3-D 401

Time Warping and Optical Flow 402

Working with Advanced Techniques 403

Advanced Techniques in AE 403

Advanced Techniques in Nuke 417

Interview: Jerry van der Beek, Little Fluffy Clouds, Marin, California 433

Interview: Tonya Smay, Freelance / Stardust Studios, New York City 434

Interview: Chris Staves, Justin Lane, and Jeffrey Dates, MassMarket / Psyop, New York City 436

Final Inspiration 438

AE and Nuke Tutorial Challenge 439

Appendix About the Companion DVD 440

What You'll Find on the DVD 441

Support Files 441

System Requirements 442

Using the DVD 442

Troubleshooting 442

Customer Care 443

Index 444