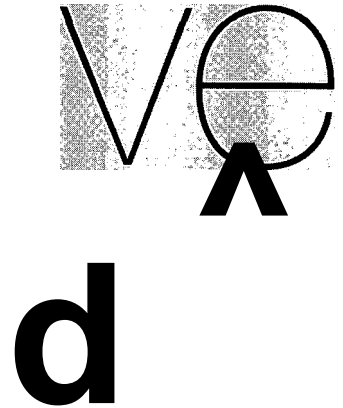


practical
proces

uide



UNIVERSITÄT
LIECHTENSTEIN
Bibliothek

matt pearson';

/i
MA¹¹ . . .

shel..

able of contents

Part 1 Creative Coding

List of artworks	viii
Foreword	x
Preface	xii
Acknowledgments	xiv
About this book	xv
About the author	xvii

Introduction:

The Organic vs. the Mechanical	xviii
Generative art is easy	xxii
Order and chaos	xxv
Programming as poetry	xxxv
The chaos artist	xli

1 Generative Art: In Theory and Practice	3
1.1 Not your father's art form	4
1.2 The history of a new idea	6
1.3 The digital toolset	9
1.3.1 Perpetual impermanence	9
1.3.2 The latest in primitive technology	11
1.4 Summary	12
2 Processing: A Programming Language for Artists	13
2.1 What is Processing?	14
2.1.1 Bold strides and baby steps	15
2.1.2 Hello World	17
2.2 Programmatic drawing	19
2.2.1 Functions, parameters, and color values	20
2.2.2 Strokes, styles and co-ordinates	22
2.2.3 Variables	23
2.2.4 Fills, alpha values, and drawing order	24
2.3 Structure, logic, and animation	27
2.3.1 The frame loop	27
2.3.2 Writing your own functions	30
2.3.3 Operators	31
2.3.4 Conditionals	33
2.4 Looping	34
2.4.1 While loops	35
2.4.2 Leaving traces	37
2.4.3 For loops	39
2.5 Saving, publishing, and distributing your work	40
2.5.1 Version control	42
2.5.2 Creating stills	43
2.5.3 Using a still as an alt image	44
2.5.4 Creating video	44
2.5.5 Frame rates and screen sizes	45
2.5.6 Mobile devices, iPhone/iPad, and Android	46
2.6 Summary	47

Part 2 Randomness and Noise

- 3 The Wrong Way to Draw A Line 51
 - 3.1 **Randomness and not-so-randomness** 52
 - 3.2 **Iterative variance** 54
 - 3.3 **Naturalistic variance** 57
 - 3.3.1 Perlin noise in Processing 57
 - 3.3.2 Creating your own noise 60
 - 3.3.3 A custom random function 63
 - 3.4 **Summary** 64
- 4 The Wrong Way to Draw a Circle 65
 - 4.1 **Rotational drawing** 66
 - 4.1.1 Drawing your first circle 67
 - 4.1.2 Turning a circle into a spiral 69
 - 4.1.3 Noisy spirals 69
 - 4.1.4 Creating your own noise, revisited 73
 - 4.2 **Case study: Wave Clock** 76
 - 4.3 **Summary** 82
- 5 Adding Dimensions 83
 - 5.1 **Two-dimensional noise** 84
 - 5.1.1 Creating a noise grid 84
 - 5.1.2 Noise visualizations 85
 - 5.2 **Noisy animation** 89
 - 5.3 **The third dimension** 92
 - 5.3.1 Drawing in 3D space 93
 - 5.3.2 Three-dimensional noise 95
 - 5.3.3 The wrong way to draw a sphere 100
 - 5.4 **Summary** 103

Part 3 Complexity

- 6 Emergence 107
 - 6.1 **Emergence defined** 108
 - 6.1.1 Ant colonies and flocking algorithms 108
 - 6.1.2 Think locally, act locally 110
 - 6.2 **Object-oriented programming** 112
 - 6.2.1 Classes and instances 113
 - 6.2.2 Local knowledge (collision detection] 120
 - 6.2.3 Interaction patterns 121
 - 6.3 **Summary** 126
- 7 Autonomy 127
 - 7.1 **Cellular automata** 128
 - 7.1.1 Setting up the framework 130
 - 7.1.2 The Game of Life 134
 - 7.1.3 VichniacVote 137
 - 7.1.4 Brian's Brain 138
 - 7.1.5 Waves (averaging) 143
 - 7.2 **Simulation and visualization** 146
 - 7.2.1 Software agents 146
 - 7.2.2 Human agents 149
 - 7.3 **Summary** 153
- 8 Fractals 155
 - 8.1 **Infinite recursion** 158
 - 8.2 **Coding self-similarity** 159
 - 8.2.1 Trunks and branches 159
 - 8.2.2 Animating your tree 163
 - 8.3 **Exponential growth** 165
 - 8.4 **Case study: Sutcliffe Pentagons** 170
 - 8.4.1 Construction 171
 - 8.4.2 Exploration 180
 - 8.5 **Summary** 187

Index 189