

Table of Contents

v

Preface	xi
How to Use This Book	1
Topical Layout	1
Finding Topics	2
Algorithm Programming	2
Class Groupings Index	7
Adaptive DW-MTM Filter	13
• Adaptive Filters	16
Adaptive MMSE Filter	17
Alpha-Trimmed Mean Filter	20
Area	23
Arithmetic Mean Filter	25
Brightness Correction	27
C.I.E. Chromaticity Diagram	29
Centroid	30
Chain Code	32
Circularity	35
Circularly Symmetric Filter	37
Closing (Binary) Filter	40
Closing (Graylevel) Filter	42
Clustering	44
• Coding and Compression	47
• Color Image Processing	48
Color Saturation Correction	49
Color Tint Correction	51
Compactness	53
Contra-Harmonic Mean Filter	54
Contrast Correction	57
Dilation (Binary) Filter	59

Dilation (Graylevel) Filter	61
Discrete Convolution	63
Discrete Correlation	65
Discrete Cosine Transform	67
Discrete Fourier Transform	70
Dithering	75
Erosion (Binary) Filter	76
Erosion (Graylevel) Filter	78
Flip	80
Fourier Transform Properties	81
Gamma Noise	82
Gaussian Filters	84
Gaussian Noise	85
Geometric Mean Filter	87
Gradient Masks	89
Graphic Interchange Format (GIF)	90
• Graphics Algorithms	93
Graylevel	94
Graylevel Histogram	95
HSI Color Model	97
Hadamard Transform	99
Harmonic Mean Filter	102
Hartley Transform	105
High Pass Spatial Filters	109
Histogram Equalization	110
Histogram Specification	112
• Histogram Techniques	115
Hit-Miss (Binary) Filter	116
Homomorphic Filter	119

Table of Contents

vii

Hough Transform	122
Huffman Coding	125
• Image Fundamentals	129
Inverse Filter	130
Joint Photographic Experts Group (JPEG)	133
Laplacian Filter	135
Least Mean Squares Filter	136
Line Detector	137
Low Pass Spatial Filters	140
MacPaint File Format	141
Mask	144
Maximum Axis	145
Maximum Filter	147
Median Filter	149
• Mensuration	151
Midpoint Filter	152
Minimum Axis	154
Minimum Filter	155
Moments	157
Morphing	160
• Morphological Filters	162
Multi-Graylevel Thresholding	163
Negative Exponential Noise	165
• Noise	167
• Nonlinear Filters	168
Nonlinear Transformations	169
Opening (Binary) Filter	171
Opening (Graylevel) Filter	173
Optimum Thresholding	175

Outline (Binary) Filter	178
PC Paintbrush (PCX)	180
Perimeter	183
Pixel	184
Point Detector	185
Pseudocolor	187
Pseudocolor Display	190
Quantization	191
RGB Color Model	192
Range Filter	194
Rayleigh Noise	196
Robert's Filter	198
Rotate	199
Run Length Encoding (RLE)	200
Salt and Pepper Noise	202
Sampling	204
Scaling	205
• Segmentation	207
Skeleton (Binary) Filter	208
Slant Transform	212
Sobel Filter	218
• Spatial Filters	220
Spatial Frequency	221
• Spatial Frequency Filters	222
Spatial Masks	223
• Storage Formats	224
Tagged Interchange File Format (TIF)	225
Thickening (Binary) Filter	229
Thinning (Binary) Filter	234

Thresholding	239
Top-Hat Filter	241
• Transforms	244
True-Color Display	245
Uniform Noise	246
Walsh Transform	248
Warping	252
Weighted Mean Filter	254
Weighted Median Filter	257
Wiener Filter	260
Wiener Filter (Parametric)	261
YIQ Color Model	264
Yp Mean Filter	265
Zooming	268
Appendix A Image.h File	270
Appendix B Example Program	271
Appendix C TIF Tags List	279
Bibliography	281
Glossary	282
Subject Index	297