

图书基本信息

书名：<<图像处理、分析与机器视觉(第2版) (平装)>>

13位ISBN编号：9787115097712

10位ISBN编号：7115097712

出版时间：2002-1

出版时间：人民邮电出版社

作者：桑肯

页数：770

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

内容概要

《图像处理、分析与机械视觉(第2版)》是为计算机专业图像处理、图像分析和机器视觉课程编写的教材，被美国卡耐基梅隆等大学选用。

《图像处理、分析与机械视觉(第2版)》针对图像处理和机器视觉领域的技术话题展开了广泛深入的讨论，包括多种格式的图像压缩、模糊逻辑识别、3D视觉等等，还附有实例的学习和讨论，力图将复杂的概念用易于理解的算法描述出来。

《图像处理、分析与机械视觉(第2版)》可作为各高等院校计算机专业研究生相应课程的教材，可以结合实际教学情况选用相应的章节。

《图像处理、分析与机械视觉(第2版)》对从事此科学领域研究的专业人士也有较高的参考价值。

书籍目录

1 Introduction 11.1 Summary 81.2 Exercises 81.3 References 92 The digitized image and its properties 102.1 Basic concepts 102.1.1 Image functions 102.1.2 The Dirac distribution and convolution 132.1.3 The Fourier transform 132.1.4 Images as a stochastic process 152.1.5 Images as linear systems 172.2 Image digitization 182.2.1 Sampling 182.2.2 Quantization 222.2.3 Color images 232.3 Digital image properties 272.3.1 Metric and topological properties of digital images 272.3.2 Histograms 322.3.3 Visual perception of the image 332.3.4 Image quality 352.3.5 Noise in images 352.4 Summary 372.5 Exercises 382.6 References 403 Data Structures for image analysis 423.1 Levels of image data representation 423.2 Traditional image data structures 433.2.1 Matrices 433.2.2 Chains 453.2.3 Topological data structures 473.2.4 Relational structures 483.3 Hierarchical data structures 493.3.1 Pyramids 493.3.2 Quadtrees 513.3.3 Other pyramidal structures 523.4 Summary 533.5 Exercises 543.6 References 554 Image pre-processing 574.1 Pixel brightness transformations 584.1.1 Position-dependent brightness correction 584.1.2 Gray-scale transformation 594.2 Geometric transformations 624.2.1 Pixel co-ordinate transformations 634.2.2 Brightness interpolation 654.3 Local pre-processing 684.3.1 Image smoothing 694.3.2 Edge detectors 774.3.3 Zero-crossings of the second derivative 834.3.4 Scale in image processing 884.3.5 Canny edge detection 904.3.6 Parametric edge models 934.3.7 Edges in multi-spectral images 944.3.8 Other local pre-processing operators 944.3.9 Adaptive neighborhood pre-processing 984.4 Image restoration 1024.4.1 Degradations that are easy to restore 1054.4.2 Inverse filtration 1064.4.3 Wiener filtration 1064.5 Summary 1084.6 Exercises 1114.7 References 1185 Segmentation 1235.1 Thresholding 1245.1.1 Threshold detection methods 1275.1.2 Optimal thresholding 1285.1.3 Multi-spectral thresholding 1315.1.4 Thresholding in hierarchical data structures 1335.2 Edge-based segmentation 1345.2.1 Edge image thresholding 1355.2.2 Edge relaxation 1375.2.3 Border tracing 1425.2.4 Border detection as graph searching 1485.2.5 Border detection as dynamic programming 1585.2.6 Hough transforms 1635.2.7 Border detection using border location information 1735.2.8 Region construction from borders 1745.3 Region-based segmentation 1765.3.1 Region merging 1775.3.2 Region splitting 1815.3.3 Splitting and merging 1815.3.4 Watershed segmentation 1865.3.5 Region growing post-processing 1885.4 Matching 1905.4.1 Matching criteria 1915.4.2 Control strategies of matching 1935.5 Advanced optimal border and surface detection approaches 1945.5.1 Simultaneous detection of border pairs 1945.5.2 Surface detection 1995.6 Summary 2055.7 Exercises 2105.8 References 2166 Shape representation and description 2286.1 Region identification 2326.2 Contour-based shape representation and description 2356.2.1 Chain codes 2366.2.2 Simple geometric border representation 2376.2.3 Fourier transforms of boundaries 2406.2.4 Boundary description using segment sequences 2426.2.5 B-spline representation 2456.2.6 Other contour-based shape description approaches 2486.2.7 Shape invariants 2496.3 Region-based shape representation and description 2546.3.1 Simple scalar region descriptors 2546.3.2 Moments 2596.3.3 Convex hull 2626.3.4 Graph representation based on region skeleton 2676.3.5 Region decomposition 2716.3.6 Region neighborhood graphs 2726.4 Shape classes 2736.5 Summary 2746.6 Exercises 2766.7 References 2797 Object recognition 2907.1 Knowledge representation 2917.2 Statistical pattern recognition 2977.2.1 Classification principles 2987.2.2 Classifier setting 3007.2.3 Classifier learning 3037.2.4 Cluster analysis 3077.3 Neural nets 3087.3.1 Feed-forward networks 3107.3.2 Unsupervised learning 3127.3.3 Hopfield neural nets 3137.4 Syntactic pattern recognition 3157.4.1 Grammars and languages 3177.4.2 Syntactic analysis, syntactic classifier 3197.4.3 Syntactic classifier learning, grammar inference 3217.5 Recognition as graph matching 3237.5.1 Isomorphism of graphs and sub-graphs 3247.5.2 Similarity of graphs 3287.6 Optimization techniques in recognition 3287.6.1 Genetic algorithms 3307.6.2 Simulated annealing 3337.7 Fuzzy systems 3367.7.1 Fuzzy sets and fuzzy membership functions 3367.7.2 Fuzzy

set operators 3387.7.3 Fuzzy reasoning 3397.7.4 Fuzzy system design and training 3437.8 Summary 3447.9 Exercises 3477.10 References 3548 Image understanding 3628.1 Image understanding control strategies 3648.1.1 Parallel and serial processing control 3648.1.2 Hierarchical control 3648.1.3 Bottom-up control strategies 3658.1.4 Model-based control strategies 3668.1.5 Combined control strategies 3678.1.6 Non-hierarchical control 3718.2 Active contour models-snakes 3748.3 Point distribution models 3808.4 Pattern recognition methods in image understanding 3908.4.1 Contextual image classification 3928.5 Scene labeling and constraint propagation 3978.5.1 Discrete relaxation 3988.5.2 Probabilistic relaxation 4008.5.3 Searching interpretation trees 4048.6 Semantic image segmentation and understanding 4048.6.1 Semantic region growing 4068.6.2 Genetic image interpretation 4088.7 Hidden Markov models 4178.8 Summary 4238.9 Exercises 4268.10 References 4289 3D Vision , geometry , and radiometry 4419.1 3D vision tasks 4429.1.1 Marrs theory 4449.1.2 Other vision paradigms : Active and purposive vision 4469.2 Geometry for 3D Vision 4489.2.1 Basics of projective geometry 4489.2.2 The single perspective camera 4499.2.3 An overview of single camera calibration 4539.2.4 Calibration of one camera from a known scene 4559.2.5 Two cameras , stereopsis 4579.2.6 The geometry of two cameras ; the fundamental matrix 4609.2.7 Relative motion of the camera ; the essential matrix 4629.2.8 Fundamental matrix estimation from image point correspondences 4649.2.9 Applications of epipolar geometry in vision 4669.2.10 Three and more cameras 4719.2.11 Stereo correspondence algorithms 4769.2.12 Active acquisition of range images 4839.3 Radiometry and 3D vision 4869.3.1 Radiometric considerations in determining gray-level 4869.3.2 Surface reflectance 4909.3.3 Shape from shading 4949.3.4 Photometric stereo 4989.4 Summary 4999.5 Exercises 5019.6 References 50210 Use of 3D vision 50810.1 Shape from X 50810.1.1 Shape from motion 50810.1.2 Shape from texture 51510.1.3 Other shape from X techniques 51710.2 Full 3D objects 51910.2.1 3D objects , models , and related issues 51910.2.2 Line labeling 52110.2.3 Volumetric representation , direct measurements 52310.2.4 Volumetric modeling strategies 52510.2.5 Surface modeling strategies 52710.2.6 Registering surface patches and their fusion to get a full 3D model 52910.3 3D model-based vision 53510.3.1 General considerations 53510.3.2 Goads algorithm 53710.3.3 Model-based recognition of curved objects from intensity images 54110.3.4 Model-based recognition based on range images 54310.4 2D view-based representations of a 3D scene 54410.4.1 Viewing space 54410.4.2 Multi-view representations and aspect graphs 54410.4.3 Geons as a 2D view-based structural representation 54510.4.4 Visualizing 3D real-world scenes using stored collections of 2D views 54610.5 Summary 55110.6 Exercises 55210.7 References 55311 Mathematical morphology 55911.1 Basic morphological concepts 55911.2 Four morphological principles 56111.3 Binary dilation and erosion 56311.3.1 Dilation 56311.3.2 Erosion 56511.3.3 Hit-or-miss transformation 56811.3.4 Opening and closing 56811.4 Gray-scale dilation and erosion 56811.4.1 Top surface , umbra , and gray-scale dilation and erosion 57011.4.2 Umbra homeomorphism theorem , properties of erosion and dilation , opening and closing 57311.4.3 Top hat transformation 57411.5 Skeletons and object marking 57611.5.1 Homotopic transformations 57611.5.2 Skeleton , maximal ball 57611.5.3 Thinning , thickening , and homotopic skeleton 57811.5.4 Quench function , ultimate erosion 58111.5.5 Ultimate erosion and distance functions 58411.5.6 Geodesic transformations 58511.5.7 Morphological reconstruction 58611.6 Granulometry 58911.7 Morphological segmentation and watersheds 59011.7.1 Particles segmentation , marking , and watersheds 59011.7.2 Binary morphological segmentation 59211.7.3 Gray-scale segmentation , watersheds 59411.8 Summary 59511.9 Exercises 59711.10 References 59812 Linear discrete image transforms 60012.1 Basic theory 60012.2 Fourier transform 60212.3 Hadamard transform 60412.4 Discrete cosine transform 60512.5 Wavelets 60612.6 Other orthogonal image transforms 60812.7 Applications of discrete image transforms 60912.8 Summary 61312.9 Exercises 61712.10 References 61913 Image data compression 62113.1 Image data properties 62213.2 Discrete image transforms in image data compression 62313.3 Predictive compression methods 62413.4 Vector quantization 62913.5

Hierarchical and progressive compression methods 63013.6 Comparison of compression methods
 63113.7 Other techniques 63213.8 Coding 63313.9 JPEG and MPEG image compression 63413.9.1
 JPEG—still image compression 63413.9.2 MPEG-full-motion video compression 63613.10 Summary
 63713.11 Exercises 64013.12 References 64114 Texture 64614.1 Statistical texture description
 64914.1.1 Methods based on spatial frequencies 64914.1.2 Co-occurrence matrices 65114.1.3 Edge
 frequency 65314.1.4 Primitive length(run length) 65514.1.5 Laws texture energy measures 56514.1.6
 Fractal texture description 65714.1.7 Other statistical methods of texture description 65914.2 Syntactic
 texture description methods 66014.2.1 Shape chain grammars 66114.2.2 Graph grammars 66314.2.3
 Primitive grouping in hierarchical textures 66414.3 Hybrid texture description methods 66614.4 Texture
 recognition method applications 66714.5 Summary 66814.6 Exercises 67014.7 References 67215
 Motion analysis 67915.1 Differential motion analysis methods 68215.2 Optical flow 68515.2.1
 Optical flow computation 68615.2.2 Global and local optical flow estimation 68915.2.3 Optical flow
 computation approaches 69015.2.4 Optical flow in motion analysis 69315.3 Analysis based on
 correspondence of interest points 69615.3.1 Detection of interest points 69615.3.2 Correspondence of
 interest points 69715.3.3 Object tracking 70015.4 Kalman filters 70815.4.1 Example 70915.5
 Summary 71015.6 Exercises 71215.7 References 71416 Case studies 72216.1 An optical music
 recognition system 72216.2 Automated image analysis in cardiology 72716.2.1 Robust analysis of coronary
 angiograms 73016.2.2 Knowledge-based analysis of intra-vascular ultrasound 73316.3 Automated
 identification of airway trees 73816.4 Passive surveillance 74416.5 References 750Index 755

版权说明

本站所提供下载的PDF图书仅提供预览和简介, 请支持正版图书。

更多资源请访问:<http://www.tushu007.com>