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Digital Image Processing Methods - Edward R. Dougherty 2020-08-26

This unique reference presents in-depth coverage of the latest methods and applications of digital image processing describing various computer architectures ideal for satisfying specific image processing demands.

Optical and Digital Image Processing - Gabriel Cristobal 2013-02-12

In recent years, Moore's law has fostered the steady growth of the field of digital image processing, though the computational complexity remains a problem for most of the digital image processing applications. In parallel, the research domain of optical image processing has matured, potentially bypassing the problems digital approaches were suffering and bringing new applications. The advancement of technology calls for applications and knowledge at the intersection of both areas but there is a clear knowledge gap between the digital signal processing and the optical processing communities. This book covers the fundamental basis of the optical and image processing techniques by integrating contributions from both optical and digital research communities to solve current application bottlenecks, and give rise to new applications and solutions. Besides focusing on joint research, it also aims at disseminating the knowledge existing in both domains. Applications covered include image restoration, medical imaging, surveillance, holography, etc... "a very good book that deserves to be on the bookshelf of a serious student or scientist working in these areas." Source: Optics and Photonics News

Digital Image Processing - Wilhelm Burger 2012-01-19

Written as an introduction for undergraduate students, this textbook covers the most important methods in digital image processing. Formal and mathematical aspects are discussed at a fundamental level and various practical examples and exercises supplement the text. The book uses the image processing environment ImageJ, freely distributed by the National Institute of Health. A comprehensive website supports the book, and contains full source code for all examples in the book, a question and answer forum, slides for instructors, etc. Digital Image Processing in Java is the definitive textbook for computer science students studying image processing and digital processing.

Understanding Digital Image Processing - Vipin Tyagi 2018-09-13

This book introduces the fundamental concepts of modern digital image processing. It aims to help the students, scientists, and practitioners to understand the concepts through clear explanations, illustrations and examples. The discussion of the general concepts is supplemented with examples from applications and ready-to-use implementations of concepts in MATLAB®. Program code of some important concepts in programming language 'C' is provided. To explain the concepts, MATLAB® functions are used throughout the book. MATLAB® Version 9.3 (R2017b), Image Acquisition Toolbox Version 5.3 (R2017b), Image Processing Toolbox, Version 10.1 (R2017b) have been used to create the book material. Meant for students and practicing engineers, this book provides a clear, comprehensive and up-to-date introduction to Digital Image Processing in a pragmatic manner.

Digital Image Processing for Medical Applications - Geoff Dougherty 2009

Hands-on text for a first course aimed at end-users, focusing on concepts, practical issues and problem solving.

Digital Image Processing - J M Blackledge 2005-11-30

This authoritative text (the second part of a complete MSc course) provides mathematical methods required to describe images, image formation and different imaging systems, coupled with the principle techniques used for processing digital images. It is based on a course for postgraduates reading physics, electronic engineering, telecommunications engineering, information technology and computer science. This book relates the methods of processing and interpreting digital images to the 'physics' of imaging systems. Case studies reinforce the methods discussed, with examples of current research themes.

Provides mathematical methods required to describe images, image formation and different imaging systems Outlines the principle techniques used for processing digital images Relates the methods of processing and interpreting digital images to the 'physics' of imaging systems

Architectural Photography - Adrian Schulz 2012

A step-by-step guide to architectural photography covers such topics as cameras, lenses, accessories, shooting techniques, and post-processing techniques.

Digital Image Processing - Uvais Qidwai 2009-10-15

Avoiding heavy mathematics and lengthy programming details, Digital Image Processing: An Algorithmic Approach with MATLAB® presents an easy methodology for learning the fundamentals of image processing. The book applies the algorithms using MATLAB®, without bogging down students with syntactical and debugging issues. One chapter can typically be completed per week, with each chapter divided into three sections. The first section presents theoretical topics in a very simple and basic style with generic language and mathematics. The second section explains the theoretical concepts using flowcharts to streamline the concepts and to form a foundation for students to code in any programming language. The final section supplies MATLAB codes for reproducing the figures presented in the chapter. Programming-based exercises at the end of each chapter facilitate the learning of underlying concepts through practice. This textbook equips undergraduate students in computer engineering and science with an essential understanding of digital image processing. It will also help them comprehend more advanced topics and sophisticated mathematical material in later courses. A color insert is included in the text while various instructor resources are available on the author's website.

Digital Image Processing with Application to Digital Cinema - K. Thyagarajan 2006

First Published in 2006. Routledge is an imprint of Taylor & Francis, an informa company.

Fundamentals of Digital Image Processing - S. Annadurai 2007

Architectural Photography, 3rd Edition - Adrian Schulz 2015-09-29

Architectural photography is more than simply choosing a subject and pressing the shutter-release button; it's more than just documenting a project. An architectural photograph shows the form and appeal of a building far better than any other medium. With the advent of the digital photographic workflow, architects, real estate firms, and interior designers are discovering exciting new opportunities to present and market their work. But what are the ingredients for a successful architectural photograph? What equipment do you need? How can you improve your images in the digital darkroom? Why does a building look different in reality than it does in a photograph? In this book you will find the answers to these questions and much more. Author Adrian Schulz—an architect and photographer by training—uses real-world projects to teach you how to:

- Capture outstanding images of buildings, inside and out
- Choose the right equipment and use it effectively
- Compose architectural shots
- Work with ambient and artificial light
- Process images in an efficient workflow based on Adobe Photoshop and other tools

This book is a step-by-step guide to architectural photography for both the aspiring amateur photographer interested in architectural photography and the professional photographer who wants to expand his skills in this domain. Moreover, architects themselves will find this book motivating and inspiring. **This third edition has been extensively revised and includes nearly 100 new images and illustrations. Updates include information on topics such as:**

- Photographic technology, including digital cameras, lens quality and construction, and large format cameras
- Shooting techniques
- The real life of a professional architectural photographer
- Traveling
- Analog to digital

shooting - Stadium photography - Image Processing, including screenshots from the latest image-processing software such as Adobe Photoshop CC With this book, you'll learn a variety of creative tips, tricks, and guidelines for making the perfect architectural image.

Computer Imaging - Scott E Umbaugh 2005-01-27

Computer Imaging: Digital Image Analysis and Processing brings together analysis and processing in a unified framework, providing a valuable foundation for understanding both computer vision and image processing applications. Taking an engineering approach, the text integrates theory with a conceptual and application-oriented style, allowing you to immediately understand how each topic fits into the overall structure of practical application development. Divided into five major parts, the book begins by introducing the concepts and definitions necessary to understand computer imaging. The second part describes image analysis and provides the tools, concepts, and models required to analyze digital images and develop computer vision applications. Part III discusses application areas for the processing of images, emphasizing human visual perception. Part IV delivers the information required to apply a CVPtools environment to algorithm development. The text concludes with appendices that provide supplemental imaging information and assist with the programming exercises found in each chapter. The author presents topics as needed for understanding each practical imaging model being studied. This motivates the reader to master the topics and also makes the book useful as a reference. The CVPtools software integrated throughout the book, now in a new Windows version, provides practical examples and encourages you to conduct additional exploration via tutorials and programming exercises provided with each chapter.

Digital Image Processing - William K. Pratt 2007-02-09

A newly updated and revised edition of the classic introduction to digital image processing The Fourth Edition of Digital Image Processing provides a complete introduction to the field and includes new information that updates the state of the art. The text offers coverage of new topics and includes interactive computer display imaging examples and computer programming exercises that illustrate the theoretical content of the book. These exercises can be implemented using the Programmer's Imaging Kernel System (PIKS) application program interface included on the accompanying CD. Suitable as a textbook for students or as a reference for practitioners, this new edition provides a comprehensive treatment of these vital topics: Characterization of continuous images Image sampling and quantization techniques Two-dimensional signal processing techniques Image enhancement and restoration techniques Image analysis techniques Software implementation of image processing applications In addition, the bundled CD includes: A Solaris operating system executable version of the PIKS Scientific API A Windows operating system executable version of PIKS Scientific A Windows executable version of PIKSTool, a graphical user interface method of executing many of the PIKS Scientific operators without program compilation A PDF file format version of the PIKS Scientific C programmer's reference manual C program source demonstration programs A digital image database of most of the source images used in the book plus many others widely used in the literature Note: CD-ROM/DVD and other supplementary materials are not included as part of eBook file.

Introduction to Digital Image Processing - William K. Pratt 2013-09-13

The subject of digital image processing has migrated from a graduate to a junior or senior level course as students become more proficient in mathematical background earlier in their college education. With that in mind, Introduction to Digital Image Processing is simpler in terms of mathematical derivations and eliminates derivations of advanced s

Digital Image Processing - Bernd Jähne 2013-03-09

This long-established and well-received monograph offers an integral view of image processing - from image acquisition to the extraction of the data of interest - written by a physical scientists for other scientists. Supplements discussion of the general concepts is supplemented with examples from applications on PC-based image processing systems and ready-to-use implementations of important algorithms. Completely revised and extended, the most notable extensions being a detailed discussion on random variables and fields, 3-D imaging techniques and a unified approach to regularized parameter estimation. Complete text of the book is now available on the accompanying CD-ROM. It is hyperlinked so that it can be used in a very flexible way. CD-ROM contains a full set of exercises to all topics covered by this book and a runtime version of the image processing software heurisko. A large

collection of images, image sequences, and volumetric images is available for practice exercises

Digital Image Processing and Analysis - Scott E Umbaugh 2017-11-30

Digital image processing and analysis is a field that continues to experience rapid growth, with applications in many facets of our lives. Areas such as medicine, agriculture, manufacturing, transportation, communication systems, and space exploration are just a few of the application areas. This book takes an engineering approach to image processing and analysis, including more examples and images throughout the text than the previous edition. It provides more material for illustrating the concepts, along with new PowerPoint slides. The application development has been expanded and updated, and the related chapter provides step-by-step tutorial examples for this type of development. The new edition also includes supplementary exercises, as well as MATLAB-based exercises, to aid both the reader and student in development of their skills.

Digital Image Processing - D. Sundararajan 2017-10-12

This book offers readers an essential introduction to the fundamentals of digital image processing. Pursuing a signal processing and algorithmic approach, it makes the fundamentals of digital image processing accessible and easy to learn. It is written in a clear and concise manner with a large number of 4 x 4 and 8 x 8 examples, figures and detailed explanations. Each concept is developed from the basic principles and described in detail with equal emphasis on theory and practice. The book is accompanied by a companion website that provides several MATLAB programs for the implementation of image processing algorithms. The book also offers comprehensive coverage of the following topics: Enhancement, Transform processing, Restoration, Registration, Reconstruction from projections, Morphological image processing, Edge detection, Object representation and classification, Compression, and Color processing.

Digital Image Processing - Rafael C. Gonzalez 2018

Introduce your students to image processing with the industry's most prized text For 40 years, Image Processing has been the foundational text for the study of digital image processing. The book is suited for students at the college senior and first-year graduate level with prior background in mathematical analysis, vectors, matrices, probability, statistics, linear systems, and computer programming. As in all earlier editions, the focus of this edition of the book is on fundamentals. The 4th Edition, which celebrates the book's 40th anniversary, is based on an extensive survey of faculty, students, and independent readers in 150 institutions from 30 countries. Their feedback led to expanded or new coverage of topics such as deep learning and deep neural networks, including convolutional neural nets, the scale-invariant feature transform (SIFT), maximally-stable extremal regions (MSERs), graph cuts, k-means clustering and superpixels, active contours (snakes and level sets), and exact histogram matching. Major improvements were made in reorganizing the material on image transforms into a more cohesive presentation, and in the discussion of spatial kernels and spatial filtering. Major revisions and additions were made to examples and homework exercises throughout the book. For the first time, we added MATLAB projects at the end of every chapter, and compiled support packages for you and your teacher containing, solutions, image databases, and sample code. The support materials for this title can be found at www.ImageProcessingPlace.com

Digital Image Processing: Part I -

Handbook of Image Processing and Computer Vision - Arcangelo Distante 2020-05-28

Across three volumes, the Handbook of Image Processing and Computer Vision presents a comprehensive review of the full range of topics that comprise the field of computer vision, from the acquisition of signals and formation of images, to learning techniques for scene understanding. The authoritative insights presented within cover all aspects of the sensory subsystem required by an intelligent system to perceive the environment and act autonomously. Volume 1 (From Energy to Image) examines the formation, properties, and enhancement of a digital image. Topics and features: • Describes the fundamental processes in the field of artificial vision that enable the formation of digital images from light energy • Covers light propagation, color perception, optical systems, and the analog-to-digital conversion of the signal • Discusses the information recorded in a digital image, and the image processing algorithms that can improve the visual qualities of the image • Reviews boundary extraction algorithms, key linear and geometric transformations, and techniques for image restoration • Presents a selection of different image

segmentation algorithms, and of widely-used algorithms for the automatic detection of points of interest • Examines important algorithms for object recognition, texture analysis, 3D reconstruction, motion analysis, and camera calibration • Provides an introduction to four significant types of neural network, namely RBF, SOM, Hopfield, and deep neural networks This all-encompassing survey offers a complete reference for all students, researchers, and practitioners involved in developing intelligent machine vision systems. The work is also an invaluable resource for professionals within the IT/software and electronics industries involved in machine vision, imaging, and artificial intelligence. Dr. Cosimo Distanto is a Research Scientist in Computer Vision and Pattern Recognition in the Institute of Applied Sciences and Intelligent Systems (ISAI) at the Italian National Research Council (CNR). Dr. Arcangelo Distanto is a researcher and the former Director of the Institute of Intelligent Systems for Automation (ISSIA) at the CNR. His research interests are in the fields of Computer Vision, Pattern Recognition, Machine Learning, and Neural Computation.

Principles of Digital Image Processing - Wilhelm Burger 2013-11-18 This textbook is the third of three volumes which provide a modern, algorithmic introduction to digital image processing, designed to be used both by learners desiring a firm foundation on which to build, and practitioners in search of critical analysis and concrete implementations of the most important techniques. This volume builds upon the introductory material presented in the first two volumes with additional key concepts and methods in image processing. Features: practical examples and carefully constructed chapter-ending exercises; real implementations, concise mathematical notation, and precise algorithmic descriptions designed for programmers and practitioners; easily adaptable Java code and completely worked-out examples for easy inclusion in existing applications; uses ImageJ; provides a supplementary website with the complete Java source code, test images, and corrections; additional presentation tools for instructors including a complete set of figures, tables, and mathematical elements.

Image Processing and GIS for Remote Sensing - Jian Guo Liu 2016-01-04 Following the successful publication of the 1st edition in 2009, the 2nd edition maintains its aim to provide an application-driven package of essential techniques in image processing and GIS, together with case studies for demonstration and guidance in remote sensing applications. The book therefore has a "3 in 1" structure which pinpoints the intersection between these three individual disciplines and successfully draws them together in a balanced and comprehensive manner. The book conveys in-depth knowledge of image processing and GIS techniques in an accessible and comprehensive manner, with clear explanations and conceptual illustrations used throughout to enhance student learning. The understanding of key concepts is always emphasised with minimal assumption of prior mathematical experience. The book is heavily based on the authors' own research. Many of the author-designed image processing techniques are popular around the world. For instance, the SFIM technique has long been adopted by ASTRIUM for mass-production of their standard "Pan-sharpen" imagery data. The new edition also includes a completely new chapter on subpixel technology and new case studies, based on their recent research.

Fundamentals of Three-dimensional Digital Image Processing - Junichiro Toriwaki 2009-04-23

This book is a detailed description of the basics of three-dimensional digital image processing. A 3D digital image (abbreviated as "3D image" below) is a digitalized representation of a 3D object or an entire 3D space, stored in a computer as a 3D array. Whereas normal digital image processing is concerned with screens that are a collection of square shapes called "pixels" and their corresponding density levels, the "image plane" in three dimensions is represented by a division into cubical graphical elements (called "voxels") that represent corresponding density levels. In the context of image processing, in many cases 3D image processing will refer to the input of multiple 2D images and performing processing in order to understand the 3D space (or "scene") that they depict. This is a result of research into how to use input from image sensors such as television cameras as a basis for learning about a 3D scene, thereby replicating the sense of vision for humans or intelligent robots, and this has been the central problem in image processing research since the 1970s. However, a completely different type of image with its own new problems, the 3D digital image discussed in this book, rapidly took prominence in the 1980s, particularly in the field of medical imaging. These were recordings of human bodies obtained through computed (or "computerized") tomography (CT), images that recorded not only the external, visible surface of the subject

but also, to some degree of resolution, its internal structure. This was a type of image that no one had experienced before.

Encyclopedia of Image Processing - Phillip A. Laplante 2018-11-08 The Encyclopedia of Image Processing presents a vast collection of well-written articles covering image processing fundamentals (e.g. color theory, fuzzy sets, cryptography) and applications (e.g. geographic information systems, traffic analysis, forgery detection). Image processing advances have enabled many applications in healthcare, avionics, robotics, natural resource discovery, and defense, which makes this text a key asset for both academic and industrial libraries and applied scientists and engineers working in any field that utilizes image processing. Written by experts from both academia and industry, it is structured using the ACM Computing Classification System (CCS) first published in 1988, but most recently updated in 2012.

Digital Image Processing: Practical Approach - Borko Furht 2018-08-28 The SpringerBrief covers fundamentals of digital image processing including image concept, image file formats, creating user interfaces and many practical examples of processing images using C++ and Java. These practical examples include among other creating image histograms, performing lossless image compression, detecting change in colors, similarity-based image retrieval and others. All practical examples are accompanied with an explanation how to create programs and the obtained results. This SpringerBrief can be very useful for the undergraduate courses on image processing, providing students with the basic tools in image analysis and processing. Practitioners and researchers working in this field will also find this research useful.

Digital Image Processing - Rafael C.. Gonzalez 1987 Possibly the best book available as a text for a first course in digital image processing, this book can be used for both upper level courses in computer science or electrical engineering, and also can be applied to the industrial market.

Industrial Image Processing - Christian Demant 1999 CD-ROM contains: Examples described in text -- software NEUROCHECK.

The Essential Guide to Image Processing - Alan C. Bovik 2009-07-08 A complete introduction to the basic and intermediate concepts of image processing from the leading people in the field Up-to-date content, including statistical modeling of natural, anisotropic diffusion, image quality and the latest developments in JPEG 2000 This comprehensive and state-of-the art approach to image processing gives engineers and students a thorough introduction, and includes full coverage of key applications: image watermarking, fingerprint recognition, face recognition and iris recognition and medical imaging. "This book combines basic image processing techniques with some of the most advanced procedures. Introductory chapters dedicated to general principles are presented alongside detailed application-orientated ones. As a result it is suitably adapted for different classes of readers, ranging from Master to PhD students and beyond." - Prof. Jean-Philippe Thiran, EPFL, Lausanne, Switzerland "Al Bovik's compendium proceeds systematically from fundamentals to today's research frontiers. Professor Bovik, himself a highly respected leader in the field, has invited an all-star team of contributors. Students, researchers, and practitioners of image processing alike should benefit from the Essential Guide." - Prof. Bernd Girod, Stanford University, USA "This book is informative, easy to read with plenty of examples, and allows great flexibility in tailoring a course on image processing or analysis." - Prof. Pamela Cosman, University of California, San Diego, USA A complete and modern introduction to the basic and intermediate concepts of image processing - edited and written by the leading people in the field An essential reference for all types of engineers working on image processing applications Up-to-date content, including statistical modelling of natural, anisotropic diffusion, image quality and the latest developments in JPEG 2000

Introductory Digital Image Processing - John R. Jensen 2015-04-17 For junior/graduate-level courses in Remote Sensing in Geography, Geology, Forestry, and Biology. Introductory Digital Image Processing: A Remote Sensing Perspective focuses on digital image processing of aircraft- and satellite-derived, remotely sensed data for Earth resource management applications. Extensively illustrated, it explains how to extract biophysical information from remote sensor data for almost all multidisciplinary land-based environmental projects. Part of the Pearson Series Geographic Information Science. Now in full color, the Fourth Edition provides up-to-date information on analytical methods used to analyze digital remote sensing data. Each chapter contains a substantive reference list that can be used by students and scientists as a starting

place for their digital image processing project or research. A new appendix provides sources of imagery and other geospatial information.
Digital Image Processing - Castleman 2007-09

A Course on Digital Image Processing with MATLAB - P. K. Thiruvikraman 2019

Concentrating on the principles and techniques of image processing, this book provides an in-depth presentation of key topics, including many techniques not included in introductory texts. Practical implementation of the various image processing algorithms is an important step in learning the subject, and computer packages such as MATLAB facilitate this without the need to learn more complex programming languages. Whilst two chapters are devoted to the MATLAB programming environment and the image processing toolbox, the use of image processing algorithms using MATLAB is emphasised throughout the book, and every chapter is accompanied by a collection of exercises and programming assignments. Including coverage of colour and video image processing as well as object recognition, the book is augmented with supplementary MATLAB code and hints and solutions to problems are also provided.

Remote Sensing - Robert A. Schowengerdt 2012-12-02

This book is a completely updated, greatly expanded version of the previously successful volume by the author. The Second Edition includes new results and data, and discusses a unified framework and rationale for designing and evaluating image processing algorithms. Written from the viewpoint that image processing supports remote sensing science, this book describes physical models for remote sensing phenomenology and sensors and how they contribute to models for remote-sensing data. The text then presents image processing techniques and interprets them in terms of these models. Spectral, spatial, and geometric models are used to introduce advanced image processing techniques such as hyperspectral image analysis, fusion of multisensor images, and digital elevation model extraction from stereo imagery. The material is suited for graduate level engineering, physical and natural science courses, or practicing remote sensing scientists. Each chapter is enhanced by student exercises designed to stimulate an understanding of the material. Over 300 figures are produced specifically for this book, and numerous tables provide a rich bibliography of the research literature.

Digital Image Processing and Analysis - Scott E Umbaugh 2010-11-19

Whether for computer evaluation of otherworldly terrain or the latest high definition 3D blockbuster, digital image processing involves the acquisition, analysis, and processing of visual information by computer and requires a unique skill set that has yet to be defined a single text. Until now. Taking an applications-oriented, engineering approach, *Digital Image Processing and Analysis* provides the tools for developing and advancing computer and human vision applications and brings image processing and analysis together into a unified framework. Providing information and background in a logical, as-needed fashion, the author presents topics as they become necessary for understanding the practical imaging model under study. He offers a conceptual presentation of the material for a solid understanding of complex topics and discusses the theory and foundations of digital image processing and the algorithm development needed to advance the field. With liberal use of color through-out and more materials on the processing of color images than the previous edition, this book provides supplementary exercises, a new chapter on applications, and two major new tools that allow for batch processing, the analysis of imaging algorithms, and the overall research and development of imaging applications. It includes two new software tools, the Computer Vision and Image Processing Algorithm Test and Analysis Tool (CVIP-ATAT) and the CVIP Feature Extraction and Pattern Classification Tool (CVIP-FEPC). Divided into five major sections, this book provides the concepts and models required to analyze digital images and develop computer vision and human consumption applications as well as all the necessary information to use the CVIP tools environment for algorithm development, making it an ideal reference tool for this fast growing field.

An Interdisciplinary Introduction to Image Processing - Steven L. Tanimoto 2012-04-27

Basic principles of image processing and programming explained without college-level mathematics. This book explores image processing from several perspectives: the creative, the theoretical (mainly mathematical), and the programmatical. It explains the basic principles of image processing, drawing on key concepts and techniques from mathematics, psychology of perception, computer science, and art, and introduces computer programming as a way to get more control over image

processing operations. It does so without requiring college-level mathematics or prior programming experience. The content is supported by PixelMath, a freely available software program that helps the reader understand images as both visual and mathematical objects. The first part of the book covers such topics as digital image representation, sampling, brightness and contrast, color models, geometric transformations, synthesizing images, stereograms, photomosaics, and fractals. The second part of the book introduces computer programming using an open-source version of the easy-to-learn Python language. It covers the basics of image analysis and pattern recognition, including edge detection, convolution, thresholding, contour representation, and K-nearest-neighbor classification. A chapter on computational photography explores such subjects as high-dynamic-range imaging, autofocus, and methods for automatically inpainting to fill gaps or remove unwanted objects in a scene. Applications described include the design and implementation of an image-based game. The PixelMath software provides a "transparent" view of digital images by allowing the user to view the RGB values of pixels by zooming in on an image. PixelMath provides three interfaces: the pixel calculator; the formula page, an advanced extension of the calculator; and the Python window.

Digital Image Processing - Rafael C. Gonzalez 2002

Digital Image Processing has been the leading textbook in its field for more than 20 years. As was the case with the 1977 and 1987 editions by Gonzalez and Wintz, and the 1992 edition by Gonzalez and Woods, the present edition was prepared with students and instructors in mind. 771e material is timely, highly readable, and illustrated with numerous examples of practical significance. All mainstream areas of image processing are covered, including a totally revised introduction and discussion of image fundamentals, image enhancement in the spatial and frequency domains, restoration, color image processing, wavelets, image compression, morphology, segmentation, and image description.

Coverage concludes with a discussion of the fundamentals of object recognition. Although the book is completely self-contained, a Companion Website (see inside front cover) provides additional support in the form of review material, answers to selected problems, laboratory project suggestions, and a score of other features. A supplementary instructor's manual is available to instructors who have adopted the book for classroom use. New Features *New chapters on wavelets, image morphology, and color image

Computer Processing of Remotely-Sensed Images - Paul M. Mather 2005-12-13

Remotely-sensed images of the Earth's surface provide a valuable source of information about the geographical distribution and properties of natural and cultural features. This fully revised and updated edition of a highly regarded textbook deals with the mechanics of processing remotely-sensed images. Presented in an accessible manner, the book covers a wide range of image processing and pattern recognition techniques. Features include: New topics on LiDAR data processing, SAR interferometry, the analysis of imaging spectrometer image sets and the use of the wavelet transform. An accompanying CD-ROM with: updated MIPS software, including modules for standard procedures such as image display, filtering, image transforms, graph plotting, import of data from a range of sensors. A set of exercises, including data sets, illustrating the application of discussed methods using the MIPS software. An extensive list of WWW resources including colour illustrations for easy download. For further information, including exercises and latest software information visit the Author's Website at: <http://homepage.ntlworld.com/paul.mather/ComputerProcessing3/>

Medical Imaging Systems - Andreas Maier 2018-08-02

This open access book gives a complete and comprehensive introduction to the fields of medical imaging systems, as designed for a broad range of applications. The authors of the book first explain the foundations of system theory and image processing, before highlighting several modalities in a dedicated chapter. The initial focus is on modalities that are closely related to traditional camera systems such as endoscopy and microscopy. This is followed by more complex image formation processes: magnetic resonance imaging, X-ray projection imaging, computed tomography, X-ray phase-contrast imaging, nuclear imaging, ultrasound, and optical coherence tomography.

Digital Image Processing and Analysis - J.C. Simon 2014-08-23

A NATO advanced Study Institute took place at Bonas from June 14th to June 25th 1976 on "Digital Image Processing and Analysis". This book is the lasting result of a successful meeting, where the best specialists of the field could exchange their ideas and results. The papers are arranged so as to present first the more general and tutorial articles and then the

more specific ones on applications. The general topics cover two dimensional transforms, techniques of image restoration, recursive filters, segmentation and analysis of image parts, some points of view from psychology and physiology, and problems of software and processing. The application fields concerned are remote sensing, medical applications, TV image compression, and optical character recognition. The editors wish to thank the Scientific Affairs Division of NATO for the edition of this book. Acknowledgment: This ASI has been made possible by the financial support of the NATO Scientific Affairs Division and D. R. M. E. and the material support of IRIA and the Institut de Programmation. VII TABLE OF CONTENTS William K. Pratt Two dimensional unitary transforms 1 T. S. Huang Two-dimensional Fourier transform 23 T. S. Huang Algebraic methods of image restoration 41 S. Castan Image enhancement and restoration 47 T. S. Huang Film grain noise 63 K. G. Beauchamp Two-dimensional recursive digital filtering 69 S. Attasi A new approach to 2D-recursive filtering 81 V. Cappellini Some efficient two-dimensional recursive digital filters 87 T. S. Durrani and C. E.

Fundamentals of Digital Image Processing - Chris Solomon
2011-07-05

This is an introductory to intermediate level text on the science of image processing, which employs the Matlab programming language to illustrate some of the elementary, key concepts in modern image

processing and pattern recognition. The approach taken is essentially practical and the book offers a framework within which the concepts can be understood by a series of well chosen examples, exercises and computer experiments, drawing on specific examples from within science, medicine and engineering. Clearly divided into eleven distinct chapters, the book begins with a fast-start introduction to image processing to enhance the accessibility of later topics. Subsequent chapters offer increasingly advanced discussion of topics involving more challenging concepts, with the final chapter looking at the application of automated image classification (with Matlab examples). Matlab is frequently used in the book as a tool for demonstrations, conducting experiments and for solving problems, as it is both ideally suited to this role and is widely available. Prior experience of Matlab is not required and those without access to Matlab can still benefit from the independent presentation of topics and numerous examples. Features a companion website www.wiley.com/go/solomon/fundamentals containing a Matlab fast-start primer, further exercises, examples, instructor resources and accessibility to all files corresponding to the examples and exercises within the book itself. Includes numerous examples, graded exercises and computer experiments to support both students and instructors alike.

Computer Vision - Simon J. D. Prince 2012-06-18

A modern treatment focusing on learning and inference, with minimal prerequisites, real-world examples and implementable algorithms.