Image Processing Gonzalez Chapter3

Hyperspectral Data Compression provides a survey of recent results in the field of compression of remote sensed 3D data, with a particular interest in hyperspectral imagery. Chapter 1 addresses compression architecture, and reviews and compares compression methods. Chapters 2 through 4 focus on lossless compression (where the decompressed image must be bit for bit identical to the original). Chapter 5, contributed by the editors, describes a lossless algorithm based on vector quantization with extensions to near lossless and possibly lossy compression for efficient browning and pure pixel classification. Chapter 6 deals with near lossless compression while. Chapter 7 considers lossy techniques constrained by almost perfect classification. Chapters 8 through 12 address lossy compression of hyperspectral imagery, where there is a tradeoff between compression achieved and the quality of the decompressed image. Chapter 13 examines artifacts that can arise from lossy compression.

A Selection of Image Processing Techniques: From Fundamentals to Research Front focuses on seven commonly used image-processing techniques. These are de-noising, de-blurring, repairing, de-fogging, reconstruction from projection, watermarking, and super-resolution. This book is suitable for readers who do not have a complete foundation in the principles of image technology but need to use image techniques to solve specific tasks in particular applications. Hence, elementary knowledge for further study is provided, allowing the reader to discover suitable techniques for solving practical problems and to learn the latest developments in a specific domain. This book offers readers a three-step strategy toward problem solving: first, essential principles, then, a detailed explanation, and finally, a discussion of practical and working techniques for specific tasks. Throughout, the author highlights materials pertaining to the newest developments and trends of the technologies.

The authors have designed a tutorial text to provide scientists with a technical understanding of computer-based imaging systems and how these systems interact with digital image processing algorithms. Contents include Boolean logic, image processing, image compression, basic computer architecture, advanced architectures, image processors, operating systems, error detection and correction, local area networks, object-oriented design paradigms, and software engineering. Contains numerous figures and case studies. Annotation copyrighted by Book News, Inc., Portland, OR

The foundations of image processing were reviewed. Imaging techniques are discussed and include: image resolution, image enhancement, image registration, image overlaying and mosaicking, image analysis and classification, and image data compression.

Quantitative Coherent Imaging
Introduction to Real-Time Imaging
The Image Processing Handbook
Emerging Technologies in Intelligent Applications for Image and Video Processing
Feature Extraction and Image Processing for Computer Vision

Nowadays, the technological advances allow developing many applications in different fields. In the book Colorimetry and Image Processing, two important fields are presented: colorimetry and image processing. Colorimetry is observed by a visual interactive programming learning system, an approach based on color analysis of Habanero chili pepper, an approach based on scene image segmentation centered on mathematical morphology, other systems based on the simulations of the dichromatic color appearance, and, finally, an approach based on the color reconstruction in order to enhancement its using super-resolution methods. On the other hand, image processing is shown by pansharpening algorithms for hyperspectral images, an approach based on the analysis of the low-resolution satellite images and ground-based sky camera for estimating the cloud motion, a hybrid super-resolution framework that combines desirable features of TV and PM models, a study of the real-time video analysis used for anthropometric measurements on agricultural tools and machines, and finally, an approach based on the threshold optimization iterative algorithm using the ground truth data and assessing the accuracy of a range of threshold values through the corresponding Kappa coefficient of concordance.

Image and Video Processing is an active area of research due to its potential applications for solving real-world problems. Integrating computational intelligence to analyze and interpret information from image and video technologies is an essential step to processing and applying multimedia data. Emerging Technologies in Intelligent Applications for Image and Video Processing presents the most current research relating to multimedia technologies including video and image restoration and enhancement as well as algorithms used for image and video compression, indexing and retrieval processes, and security concerns. Featuring insight from researchers from around the world, this publication is designed for use by engineers, IT specialists, researchers, and graduate level students.

This book is devoted to computer-based modeling in cardiology, by taking an educational point of view, and by summarizing knowledge from several, commonly considered delimited areas of cardiac research in a consistent way. First, the foundations and numerical techniques from mathematics are provided, with a particular focus on the finite element and finite differences methods. Then, the theory of electric fields and continuum mechanics is introduced with respect to numerical calculations in anisotropic biological media. In addition to the presentation of digital image processing techniques, the following chapters deal with particular aspects of cardiac modeling: cardiac anatomy, cardiac electro physiology, cardiac mechanics, modeling of cardiac electro mechanics. This book was written for researchers in modeling and cardiology, for clinical cardiologists, and for advanced students.

Machine vision systems offer great potential in a large number of areas of manufacturing industry and are used principally for Automated Visual Inspection and Robot Vision. This publication presents the state of the art in image processing. It discusses techniques which have been developed for designing machines for use in industrial inspection and robot control, putting the emphasis on software and algorithms. A comprehensive set of image processing subroutines, which together form the basic vocabulary for the versatile image processing language IIPL, is presented. This language has proved to be extremely effective, working as a design tool, in solving numerous practical inspection problems. The merging of this language with Prolog provides an even more powerful facility which retains the benefits of human and machine intelligence. The authors bring together the practical experience and the picture material from a leading industrial research laboratory and the mathematical foundations necessary to understand and apply concepts in image processing. Interactive Image Processing is a self-contained reference book that can also be used in graduate level courses in electrical engineering, computer science and physics.

(In 2 Volumes)
Introduction to Computer-based Imaging Systems
Mathematical and Computational Methods
Principles of Digital Image Processing
Digital Image Processing for Medical Applications
Handbook of Computer Vision Algorithms in Image Algebra

This book provides basic theories and implementations using SCILAB open-source software for digital images. The book simplifies image processing theories and well as implementation of image processing algorithms, making it accessible to those with basic knowledge of image processing. This book includes many SCILAB programs at the end of each theory, which help in understanding concepts. The book includes more than sixty SCILAB programs of the image processing theory. In the appendix, readers will find a deeper glimpse into the research areas in the image processing.

Image algebra is a comprehensive, unifying theory of image transformations, image analysis, and image understanding. In 1996, the bestselling first edition of the Handbook of Computer Vision Algorithms in Image Algebra introduced engineers, scientists, and students to this powerful tool, its basic concepts, and its use in the concise representation of computer vision algorithms. Updated to reflect recent developments and advances, the second edition continues to provide an outstanding introduction to image algebra. It describes more than 80 fundamental computer vision techniques and introduces the portable iaC++ library, which supports image algebra programming in the C++ language. Revisions to the first edition include a new chapter on geometric manipulation and spatial transformation, several additional algorithms, and the addition of exercises to each chapter. The authors-both instrumental in the groundbreaking development of image algebra-introduce each technique with a brief discussion of its purpose and methodology, then provide its precise mathematical formulation. In addition to furnishing the simple yet powerful utility of image algebra, the Handbook of Computer Vision Algorithms in Image Algebra supplies the core of knowledge all computer vision practitioners need. It offers a more practical, less esoteric presentation than those found in research publications that will soon earn it a prime location on your reference shelf.

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

A cookbook of algorithms for common image processing applications Thanks to advances in computer hardware and software, algorithms have been developed that support sophisticated image processing without requiring an extensive background in mathematics. This bestselling book has been fully updated with the newest of these, including 2D vision methods in content-based searches and the use of graphics cards as image processing computational aids. It's an ideal reference for software engineers and developers, advanced programmers, graphics programmers, scientists, and other specialists who require highly specialized image processing. Algorithms now exist for a wide variety of sophisticated image processing applications required by software engineers and developers, advanced programmers, graphics programmers, scientists, and related specialists This bestselling book has been completely updated to include the latest algorithms, including 2D vision methods in content-based searches, details on modern classifier methods, and graphics cards used as image processing computational aids Saves hours of mathematical calculating by using distributed processing and GPU programming, and gives non-mathematicians the shortcuts needed to program relatively sophisticated applications. Algorithms for Image Processing and Computer Vision, 2nd Edition provides the tools to speed development of image processing applications.

8th International Conference, ICIAR 2011, Burnaby, BC, Canada, June 22-24, 2011. Proceedings, Part I
Optical and Digital Image Processing
A Practical Approach with Examples in Matlab
High-Performance Medical Image Processing
Digital Holography and Digital Image Processing
Visual Quality Control in Manufacturing

The processing of medical images in a reasonable timeframe and with high definition is very challenging. This volume helps to meet that challenge by presenting a thorough overview of medical imaging modalities, its processing, high-performance computing, and the need to embed parallelism in medical image processing techniques to achieve efficient and fast results. With contributions from researchers from prestigious laboratories and educational institutions, High-Performance Medical Image Processing provides important information on medical image processing techniques, parallel computing techniques, and embedding parallelism in different image processing techniques. A comprehensive review of parallel algorithms in medical image processing problems is a key feature of this book. The volume presents the relevant theoretical frameworks and the latest empirical research findings in the area and provides detailed descriptions about the diverse high-performance techniques. Topics discussed include parallel computing, multicore architectures and their applications in image processing, machine learning applications, conventional and advanced magnetic resonance imaging methods, hyperspectral image processing, algorithms for segmenting 2D slices for 3D viewing, and more. Case studies, such as on the detection of cancer tumors, expound on the information presented. Key features: Provides descriptions of different medical imaging modalities and their applications Discusses the basics and advanced aspects of parallel computing with different multicore architectures Expounds on the need for embedding data and task parallelism in different medical image processing techniques Presents helpful examples and case studies of the discussed methods This book will be valuable for professionals, researchers, and students working in the field of healthcare engineering, medical imaging technology, applications in machine and deep learning, and more. It is also appropriate for courses in computer engineering, biomedical engineering and electrical engineering based on artificial intelligence, parallel computing, high performance computing, and machine learning and its applications in medical imaging.

This book describes the methods and algorithms for image pre-processing and recognition. These methods are based on a parallel shift technology of the imaging copy, as well as simple mathematical operations to allow the generation of a minimum set of features to describe and recognize the image. This book also describes the theoretical foundations of parallel shift technology and pattern recognition. Based on these methods and theories, this book is intended to help researchers with artificial intelligence systems design, robotics, and developing software and hardware applications.

Digital holography and digital image processing are twins born by computer era. They share origin, theoretical base, methods and algorithms. The present book describes these common fundamentals principles, methods and algorithms including image and hologram digitization, data compression, digital transforms and efficient computational algorithms, statistical and Monte-Carlo methods, image restoration and enhancement, image reconstruction in tomography and digital holography, discrete signal resampling and image geometrical transformations, accurate measurements and reliable target localization in images, recording and reconstruction of computer generated holograms, adaptive and nonlinear filters for sensor signal perfecting and image restoration and enhancement. The book combines theory, heavily illustrated practical methods and efficient computational algorithms and is written for senior-level undergraduate and graduate students, researchers and engineers in optics, photonics, opto-electronics and electronic engineering.

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.

Core Algorithms
Interactive Image Processing for Machine Vision
An Algorithmic Introduction Using Java
Modeling of Anatomy, Electrophysiology, and Mechanics
Progress Towards Industrial Application
Principles, Methods, Algorithms

Describing and evaluating the basic principles and methods of subsurface sensing and imaging, Introduction to Subsurface Imaging is a clear and comprehensive treatment that links theory to a wide range of real-world applications in medicine, biology, security and geophysical/environmental exploration. It integrates the different sensing techniques (acoustic, electric, electromagnetic, optical, x-ray or particle beams) by unifying the underlying physical and mathematical similarities, and computational and algorithmic methods. Time-domain, spectral and multisensor methods are also covered, whilst all the necessary mathematical, statistical and linear systems tools are given in useful appendices to make the book self-contained. Featuring a logical blend of theory and applications, a wealth of color illustrations, homework problems and numerous case studies, this is suitable for use as both a course text and as a professional reference.

*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*

First published in 1992, The Image Processing Handbook not only set the standard for professional references in this field, but also provided the first text truly accessible to undergraduate students and non-specialists. Each subsequent edition has reflected the continuing rapid advances in image processing, and the fourth edition is no

exception.
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.
Digital Image Processing
Digital Image Processing using SCILAB
Advanced Image and Video Processing Using MATLAB
Hybrid Video Compression Standard
Image Processing and Pattern Recognition in Remote Sensing
Wavelet Active Media Technology and Information Processing

The two-volume set LNCS 6753/6754 constitutes the refereed proceedings of the 8th International Conference on Image and Recognition, ICIAR 2011, held in Burnaby, Canada, in June 2011. The 84 revised full papers presented were carefully reviewed and selected from 147 submissions. The papers are organized in topical sections on image and video processing; feature extraction and pattern recognition; computer vision; color, texture, motion and shape; tracking; biomedical image analysis; biometrics; face recognition; image coding, compression and encryption; and applications.

This is the second volume of a book series that provides a modern, algori- mic introduction to digital image processing. It is designed to be used both by learners desiring a ?rm foundation on which to build and practitioners in search of critical analysis and modern implementations of the most important techniques. This updated and enhanced paperback edition of our compreh- sive textbook Digital Image Processing: An Algorithmic Approach Using Java packages the original material into a series of compact volumes, thereby s- porting a ?exible sequence of courses in digital image processing. Tailoring the contents to the scope of individual semester courses is also an attempt to p- vide a?ordable (and "backpack-compatible") textbooks without comprimising the quality and depth of content. This second volume, titled Core Algorithms, extends the introductory - terial presented in the ?rst volume (Fundamental Techniques) with additional techniques that are, nevertheless, part of the standard image processing to- box. A forthcomingthird volume(Advanced Techniques) will extendthis series and add important material beyond the elementary level, suitable for an - vanced undergraduate or even graduate course.

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

A comprehensive digital image processing book that reflects new trends in this field such as document image compression and data compression standards. The book includes a complete rewrite of image data compression, a new chapter on image analysis, and a new section on image morphology.

Theory, Methods and Some Applications
Introduction to Subsurface Imaging
Particle Image Velocimetry
Fundamentals and Applications
Digital Processing of Remotely Sensed Images
From Fundamentals to Research Front

Quantitative Coherent Imaging: Theory, Methods and Some Applications discusses the principles of interpreting the structure and material properties of objects by the way in which they scatter electromagnetic and acoustic radiation. It presents an account of the fundamental physical principles which are common to nearly all imaging systems. The book is divided into three parts. Part One deals with the mathematical and computational background to the subject. Part Two discusses the theory of quantitative coherent imaging, presenting the theoretical foundations used in a variety of applications. It looks at both acoustic and electromagnetic imaging systems. Part Three examines some of the data-processing techniques which are common to most types of imagery. It cites methods of deconvolution, image enhancement, and noise reduction. This book caters to the reader interested in different fields of research in imaging science. It explains the principles of coherent imaging and provides a text that covers the theoretical foundations of imaging science in an integrated form.
This informative book thoroughly covers information in real-time systems, imaging, optimization, algorithms and hardware for image processing. Focusing on the structure, computation and application of fundamental algorithms, this book is ideal for imaging engineers.
The book presents compression techniques for digital video stream, describing their design using various image transforms, such as discrete cosine transform (DCT), discrete wavelet transform (DWT), and singular value decomposition (SVD). It first discusses the basic requirements and applications of video compression techniques. The book then addresses video compression using DCT as well as the hybrid compression technique, designed and implemented using DCT, DWT and SVD, demonstrating the simulation results for both. Lastly, it proposes future research directions in the field.
This book offers a comprehensive introduction to advanced methods for image and video analysis and processing. It covers deraining, dehazing, inpainting, fusion, watermarking and stitching. It describes techniques for face and lip recognition, facial expression recognition, lip reading in videos, moving object tracking, dynamic scene classification, among others. The book combines the latest machine learning methods with computer vision applications, covering topics such as event recognition based on deep learning,dynamic scene classification based on topic model, person re-identification based on metric learning and behavior analysis. It also offers a systematic introduction to image evaluation criteria showing how to use them in different experimental contexts. The book offers an example-based practical guide to researchers, professionals and graduate students dealing with advanced problems in image analysis and computer vision.
Digital Image Processing: Part I
Chongqing, China, 29-31 August 2006
Image Processing and Jump Regression Analysis
Algorithms for Image Processing and Computer Vision
Hyperspectral Data Compression
Industrial Image Processing

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This book brings together everything you need to achieve superior results with PC-based image processing and analysis. Thomas Klinger combines a highly accessible overview of the field's key concepts, tools, and techniques; the first expert introduction to NI's breakthrough IMAQ Vision software; and several start-to-finish application case studies. You also get an extensive library of code and image samples, as well as a complete trial version of IMAQ Vision for Windows.
The first text to bridge the gap between image processing andjump regression analysis Recent statistical tools developed to estimate jump curves andsurfaces have broad applications, specifically in the area of imageprocessing. Often, significant differences in technicalterminologies make communication between the disciplines of imageprocessing and jump regression analysis difficult. Ineasy-to-understand language, Image Processing and JumpRegression Analysis builds a bridge between the worlds ofcomputer graphics and statistics by addressing both the connectionsand the differences between these two disciplines. The authorprovides a systematic analysis of the methodology behindnonparametric jump regression analysis by outlining procedures thatare easy to use, simple to compute, and have proven statisticaltheory behind them. Key topics include: Conventional smoothing procedures Estimation of jump regression curves Estimation of jump location curves of regression surfaces Jump-preserving surface reconstruction based on localsmoothing Edge detection in image processing Edge-preserving image restoration With mathematical proofs kept to a minimum, this book isuniquely accessible to a broad readership. It may be used as aprimary text in nonparametric regression analysis and imageprocessing as well as a reference guide for academicians andindustry professionals focused on image processing or curve/surfaceestimation.
Image processing is a hands-on discipline, and the best way to learn is by doing. This text takes its motivation from medical applications and uses real medical images and situations to illustrate and clarify concepts and to build intuition, insight and understanding. Designed for advanced undergraduates and graduate students who will become end-users of digital image processing, it covers the basics of the major clinical imaging modalities, explaining how the images are produced and acquired. It then presents the standard image processing operations, focusing on practical issues and problem solving. Crucially, the book explains when and why particular operations are done, and practical computer-based activities show how these operations affect real images. All images, links to the public-domain software ImageJ and custom plug-ins, and selected solutions are available from www.cambridge.org/books/dougherty.
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Digital Image Processing for Medical ApplicationsCambridge University Press

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Proceedings of the International Computer Conference 2006 on Wavelet Active Media Technology and Information Processing
Fundamentals of Digital Image Processing
Image Processing with LabVIEW and IMAQ Vision
25-27 October 2002, Hangzhou, China
Image Processing and Pattern Recognition Based on Parallel Shift Technology
Computational Cardiology
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Feature Extraction and Image Processing for Computer Vision is an essential guide to the implementation of image processing and computer vision techniques, with tutorial introductions and sample code in Matlab. Algorithms are presented and fully explained to enable complete understanding of the methods and techniques demonstrated. As one reviewer noted, "The main strength of the proposed book is the exemplar code of the algorithms." Fully updated with the latest developments in feature extraction, including expanded tutorials and new techniques, this new edition contains extensive new material on Haar wavelets, Viola-Jones, bilateral filtering, SURF, PCA-SIFT, moving object detection and tracking, development of symmetry operators, LBP texture analysis, Adaboost, and a new appendix on color models. Coverage of distance measures, feature detectors, wavelets, level sets and texture tutorials has been extended. Named a 2012 Notable Computer Book for Computing Methodologies by Computing Reviews Essential reading for engineers and students working in this cutting-edge field Ideal module text and background reference for courses in image processing and computer vision The only currently available text to concentrate on feature extraction with working implementation and worked through derivation

The aeronautics industry is presently aiming for faster design cycles and shorter time to market of new aircraft. It is looking at the same time for improved aerodynamic performance, for evident competitive reasons. Advanced, computer based design systems, including fast and reliable numerical flow solvers, have been developed in the last decade including new turbulence models. On the experimental side, measurement techniques in general have also been improved significantly, however the data evaluation process remains still very time consuming, and unsteady effects and turbulence are often not being captured with sufficient accuracy and detail. The development of Particle Image Velocimetry (PIV) has helped to improve the analysis of the flow fields. After investigations in laboratory scale wind tunnels, a joint initiative on PIV research, by the European Aerospace Research Establishments, within GARTEUR have enabled a wide breakthrough of this new technology in Europe. Within the Research Framework Program of the European Union, the joint research project EUROPIV aimed to apply PIV technology to problems of industrial interest.

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.

This practical introduction focuses on how to design integrated solutions for industrial vision tasks from individual algorithms. The book is now available in a revised second edition that takes into account the current technological developments, including camera technology and color imaging processing. It gives a hands-on guide for setting up automated visual inspection systems using real-world examples and the NeuroCheck® standard software that has proven industrial strength integrated in thousands of applications in real-world production lines. Based on many years of experience in industry, the authors explain all the essential details encountered in the creation of vision system installations. With example material and a demo version of the software found on "extras.springer.com" readers can work their way through the described inspection tasks and carry out their own experiments.

Medical Imaging Systems
An Introductory Guide
A Selection of Image Processing Techniques
Colorimetry and Image Processing
Image Analysis and Recognition

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