

Denoising Phase Unwrapping Algorithm For Precise Phase

The field of optical metrology offers a wealth of both practical and theoretical accomplishments, and can cite any number of academic papers recording such. However, while several books covering specific areas of optical metrology do exist, until the pages herein were researched, written, and compiled, the field lacked for a comprehensive handbook, one providing an overview of optical metrology that covers practical applications as well as fundamentals. Carefully designed to make information accessible to beginners without sacrificing academic rigor, the Handbook of Optical Metrology: Principles and Applications discusses fundamental principles and techniques before exploring practical applications. With contributions from veterans in the field, as well as from up-and-coming researchers, the Handbook offers 30 substantial and well-referenced chapters. In addition to the introductory matter, forward-thinking descriptions are included in every chapter that make this a valuable reference for all those involved with optical metrology.

The eight-volume set comprising LNCS volumes 9905-9912 constitutes the refereed proceedings of the 14th European Conference on Computer Vision, ECCV 2016, held in Amsterdam, The Netherlands, in October 2016. The 415 revised papers presented were carefully reviewed and selected from 1480 submissions. The papers cover all aspects of computer vision and pattern recognition such as 3D computer vision; computational photography, sensing and display; face and gesture; low-level vision and image processing; motion and tracking; optimization methods; physicsbased vision, photometry and shape-from-X; recognition: detection, categorization, indexing, matching; segmentation, grouping and shape representation; statistical methods and learning; video: events, activities and surveillance; applications. They are organized in topical sections on detection, recognition and retrieval; scene understanding; optimization; image and video processing; learning; action activity and tracking; 3D; and 9 poster sessions.

Environmental information and systems play a major role in environmental decision making. As such, it is vital to understand the impact that they have on different aspects of sustainable environmental management, as well as to understand the opportunism they might present for further improvement. Environmental Information Systems: Concepts, Methodologies, Tools, and Applications is an innovative reference source containing the latest research on the use of information systems to track and organize environmental data for use in an overall environmental management system. Highlighting a range of topics such as environmental analysis, remote sensing, and geographic information science, this multi-volume book is designed for engineers, data scientists, practitioners, academicians, and researchers interested in all aspects of environmental information systems.

Wiley-Interscience Series in Discrete Mathematics and Optimization Advisory Editors Ronald L. Graham Jan Karel Lenstra Robert E. Tarjan Discrete Mathematics and Optimization involves the study of finite structures. It is one of the fastest growing areas in mathematics today. The level and depth of recent advances in the area and the wide applicability of its evolving techniques point to the rapidity with which the field is moving from its beginnings to maturity and presage the ever-increasing interaction between it and computer science. The Series provides a broad coverage of discrete mathematics and optimization, ranging over such fields as combinatorics, graph theory, enumeration, mathematical programming and the analysis of algorithms, and including such topics as Ramsey theory, transversal theory, block designs, finite geometries, Polya theory, graph and matroid algorithms, network flows, polyhedral combinatorics and computational complexity. The Wiley - Interscience Series in Discrete Mathematics and Optimization will be a substantial part of the record of this extraordinary development. Recent titles in the Series: Search Problems Rudolf Ahlswede, University of Bielefeld, Federal Republic of Germany Ingo Wegener, Johann Wolfgang Goethe University, Frankfurt, Federal Republic of Germany The problems of search, exploration, discovery and identification are of key importance in a wide variety of applications. This book will be of great interest to all those concerned with searching, sorting, information processing, design of experiments and optimal allocation of resources. 1987 Introduction to Optimization E. M. L. Beale FRS, Scicon Ltd, Milton Keynes, and Imperial College, London This book is intended as an introduction to the many topics covered by the term 'optimization', with special emphasis on applications in industry. It is divided into three parts. The first part covers unconstrained optimization, the second describes the methods used to solve linear programming problems, and the third covers nonlinear programming, integer programming and dynamic programming. The book is intended for senior undergraduate and graduate students studying optimization as part of a course in mathematics, computer science or engineering. 1988

Theory, Algorithms, and Applications

Wavelet Theory and Its Applications

Methods and Applications

Principles, Methods and Applications

Simulated Annealing and Boltzmann Machines

Basics of Interferometry

6th International Conference, ICIAR 2009, Halifax, Canada, July 6-8, 2009, Proceedings

The main objective of this book is to present the basic theoretical principles and practical applications for the classical interferometric techniques and the most advanced methods in the field of modern fringe pattern analysis applied to optical metrology. A major novelty of this work is the presentation of a unified theoretical framework based on the Fourier description of phase shifting interferometry using the Frequency Transfer Function (FTF) along with the theory of Stochastic Process for the straightforward analysis and synthesis of phase shifting algorithms with desired properties such as spectral response, detuning and signal-to-noise robustness, harmonic rejection, etc.

This thesis describes the design and implementation of two novel frameworks and processing schemes for 3D imaging based on time-of-flight (TOF) principles. The first is a low power, low hardware complexity technique based on parametric signal processing for orienting and localizing simple planar scenes. The second is an improved method for simultaneously performing phase unwrapping and denoising for sinusoidal amplitude modulated continuous wave ToF cameras using multiple frequencies.

The first application uses several unfocused photodetectors with high time resolution to estimate information about features in the scene. Because the time profiles of the responses for each sensor are parametric in nature, the recovery algorithm uses finite rate of innovation (FRI) methods to estimate signal parameters. The signal parameters are then used to recover the scene features. The second application uses a generalized approximate message passing (GAMP) framework to incorporate both accurate probabilistic modeling for the measurement process and underlying scene depth map sparsity to accurately extend the unambiguous depth range of the camera. This joint processing results in improved performance over separate unwrapping and denoising steps.

This book features original research and recent advances in ICT fields related to sustainable development. Based the International Conference on Networks, Intelligent systems, Computing & Environmental Informatics for Sustainable Development, held in Marrakech in April 2020, it features peer-reviewed chapters authored by prominent researchers from around the globe. As such it is an invaluable resource for courses in computer science, electrical engineering and urban sciences for sustainable development. This book covered topics including • Green Networks • Artificial Intelligence for Sustainability • Environment Informatics • Computing Technologies

A resource like no other-the first comprehensive guide to phase unwrapping Phase unwrapping is a mathematical problem-solving technique increasingly used in synthetic aperture radar (SAR) interferometry, optical interferometry, adaptive optics, and medical imaging. In Two-Dimensional Phase Unwrapping, two internationally recognized experts sort through the multitude of ideas and algorithms cluttering current research, explain clearly how to solve phase unwrapping problems, and provide practicable algorithms that can be applied to problems encountered in diverse disciplines. Complete with case studies and examples as well as hundreds of images and figures illustrating the concepts, this book features: * A thorough introduction to the theory of phase unwrapping * Eight algorithms that constitute the state of the art in phase unwrapping * Detailed description and analysis of each algorithm and its performance in a number of phase unwrapping problems * C language software that provides a complete implementation of each algorithm * Comparative analysis of the algorithms and techniques for evaluating results * A discussion of future trends in phase unwrapping research * Foreword by former NASA scientist Dr. John C. Curlander Two-Dimensional Phase Unwrapping skillfully integrates concepts, algorithms, software, and examples into a powerful benchmark against which new ideas and algorithms for phase unwrapping can be tested. This unique introduction to a dynamic, rapidly evolving field is essential for professionals and graduate students in SAR interferometry, optical interferometry, adaptive optics, and magnetic resonance imaging (MRI).

Nanophysics, Nanomaterials, Interface Studies, and Applications

Optical Interferometry

Wireless Algorithms, Systems, and Applications

Two-Dimensional Phase Unwrapping

A Stochastic Approach to Combinatorial Optimization and Neural Computing

Concepts, Methodologies, Tools, and Applications

Mathematical Models for Remote Sensing Image Processing

The three-volume set LNCS 12937 - 12939 constitutes the proceedings of the 16th International Conference on Wireless Algorithms, Systems, and Applications, WASA 2021, which was held during June 25-27, 2021. The conference took place in Nanjing, China. The 103 full and 57 short papers presented in these proceedings were carefully reviewed and selected from 315 submissions. The following topics are covered in Part I of the set: network protocols, signal processing, wireless telecommunication systems, blockchain, IoT and edge computing, artificial intelligence, computer security, distributed computer systems, machine learning, and others.

Speckle metrology includes various optical techniques that are based on the speckle fields generated by reflection from a rough surface or by transmission through a rough diffuser. These techniques have proven to be very useful in testing different materials in a non-destructive way. They have changed dramatically during the last years due to the development of modern optical components, with faster and more powerful digital computers, and novel data processing approaches. This most up-to-date overview of the topic describes new techniques developed in the field of speckle metrology over the last decade, as well as applications to experimental mechanics, material science, optical testing, and fringe analysis.

This book provides a detailed overview on the use of global optimization and parallel computing in microwave tomography techniques. The book focuses on techniques that are based on global optimization and electromagnetic numerical methods. The authors provide parallelization techniques on homogeneous and heterogeneous computing architectures on high performance and general purpose futuristic computers. The book also discusses the multi-level optimization technique, hybrid genetic algorithm and its application in breast cancer imaging.

Time-of-flight (TOF) cameras provide a depth value at each pixel, from which the 3D structure of the scene can be estimated. This new type of active sensor makes it possible to go beyond traditional 2D image processing, directly to depth-based and 3D scene processing. Many computer vision and graphics applications can benefit from TOF data, including 3D reconstruction, activity and gesture recognition, motion capture and face detection. It is already possible to use multiple TOF cameras, in order to increase the scene coverage, and to combine the depth data with images from several colour cameras. Mixed TOF and colour systems can be used for computational photography, including full 3D scene modelling, as well as for illumination and depth-of-field manipulations. This work is a technical introduction to TOF sensors, from architectural and design issues, to

selected image processing and computer vision methods.

Microwave Tomography

Advanced Brain Neuroimaging Topics in Health and Disease

Fringe Pattern Analysis for Optical Metrology

Theory and Applications

Development and Characterization of a Dispersion-Encoded Method for Low-Coherence Interferometry

Selected and Expanded Reports from ICMIC'17

The Proceedings of NICE2020 International Conference

The book provides insights into the Second International Conference on Computer Vision & Image Processing (CVIP-2017) organized by the Department of Computer Science and Engineering of Indian Institute of Technology Roorkee. The book presents technological research outcomes in the area of image processing and computer vision. The topics covered in this book are image/video processing; image/video analysis; image/video formation and display; image/video filtering, restoration, enhancement and super-resolution; image/video transmission; image/video storage, retrieval and authentication; image/video quality; transform-based and multi-resolution image analysis; biological and perceptual models for image/video processing; machine learning in image/video analysis; probability and statistics for image/video handling for image/video processing; motion and tracking; segmentation and recognition; shape, structure and stereo.

The major progress in computer vision allows us to make extensive use of medical imaging data to provide us better diagnosis and prediction of diseases. Computer vision can exploit texture, shape, contour and prior knowledge along with contextual information from an image sequence and provide 3D and 4D information that helps with better human understanding. Many powerful tools have been developed through image segmentation, machine learning, pattern classification, tracking, reconstruction to bring much needed quantitative information not easily available by trained human specialists. The aim of the book is for both medical imaging professionals to acquire and analyze data, and computer vision professionals to provide enhanced medical information by using computer vision techniques. The findings will benefit the patients without adding to the already high medical costs.

This Open Access book discusses an extension to low-coherence interferometry by dispersion-encoding. The approach is theoretical and implemented for applications such as surface profilometry, polymeric cross-linking estimation and the determination of thicknesses. During a characterization, it was shown that an axial measurement range of 79.91 μm with an axial resolution of 0.1 μm is achievable. Simultaneously, profiles of up to 1.5 mm in length were obtained in a scan-free manner. This marked a significant improvement in relation to the state-of-the-art in terms of dynamic range. Also, the axial and lateral measurement range were decoupled parallel to functional parameters such as surface roughness were estimated. The characterization of the degree of polymeric cross-linking was done as a function of the refractive index. It was acquired in a spatially-resolved manner with a resolution of 3.36×10^{-5} . This was the development of a novel mathematical analysis approach.

This book constitutes the refereed proceedings of the 6th International Conference on Image Analysis and Recognition, ICIAR 2009, Halifax, Canada, in July 2009. The 93 revised full papers presented were carefully reviewed and selected from 164 submissions. The papers are organized in topical sections on image and video processing and analysis; image segmentation; image and video retrieval and analysis; pattern analysis and recognition; biometrics face recognition; shape analysis; motion analysis and tracking; 3D image analysis; image analysis; document analysis and applications.

Advances in Geoscience and Remote Sensing

Time-of-Flight Cameras

CVIP 2017, Volume 1

Estimation of Phase and Its Derivatives

14th European Conference, Amsterdam, The Netherlands, October 11-14, 2016, Proceedings, Part IV

Image Analysis

Advanced Concepts for Intelligent Vision Systems

This book presents some of the latest achievements in nanotechnology and nanomaterials from leading researchers in Ukraine, Europe, and beyond. It features selected peer-reviewed contributions from participants in the 4th International Science and Practice Conference Nanotechnology and Nanomaterials (NANO2016) held in Lviv, Ukraine on August 24-27, 2016. The International Conference was organized jointly by the Institute of Physics of the National Academy of Sciences of Ukraine, Ivan Franko National University of Lviv (Ukraine), University of Tartu (Estonia), University of Turin (Italy), and Pierre and Marie Curie University (France). Internationally recognized experts from a wide range of universities and research institutions share their knowledge and key results on topics ranging from nanooptics, nanoplasmonics, and interface studies to energy storage and biomedical applications.

The two-volume set CCIS 1332 and 1333 constitutes thoroughly refereed contributions presented at the 27th International Conference on Neural Information Processing, ICONIP 2020, held in Bangkok, Thailand, in November 2020.* For ICONIP 2020 a total of 378 papers were carefully reviewed and selected for publication out of 618 submissions. The 191 papers included in this volume set were organized in topical sections as follows: data mining; healthcare analytics-improving healthcare outcomes using big data analytics; human activity recognition; image processing and computer vision; natural language processing; recommender systems; the 13th international workshop on artificial intelligence and cybersecurity; computational intelligence; machine learning; neural network models; robotics and control; and time series analysis. * The conference was held virtually due to the COVID-19 pandemic.

This book contains review papers presented at the International Workshop on Wave Propagation, Scattering and Emission on Theory, Experiment, Simulation and Inversion (WPSE). The papers are of high quality, covering broad areas: a new mechanism of interaction of electromagnetic waves with complex media, remote sensing information, computational electromagnetics, etc. This book summarizes the most significant progress in wave propagation, encompassing theory, experiment, simulation, and inversion. It will also serve as a good reference for scientists in future research. List of Foreign Invited Speakers: Henry Bertoni (Brooklyn Polytechnic University), Lawrence Carin (Duke U), Al Chang (NASA, Goddard), Margaret Cheney (Rensselaer Polytech Institute), Weng Chew (U of Illinois at Urbana Champaign), Shane Cloude (AEL Consultants, UK), Adrian Fung (U of Texas at Arlington), Al Gasiewski (Environmental Tech Lab, NOAA), Martti Hallikainen (Helsinki U of Technology), Akira Ishimaru (U of Washington), Magdy Iskander (U of Hawaii), J A Kong (MIT), Roger Lang (George Washington U), Alex Maradudin (U of California at Irvine), Eric Michielssen (U of Illinois at Urbana Champaign), Eni Njoku (Caltech, Jet Propulsion Lab), Carey Rappaport (Northeastern U), Marc Saillard (Institut Fresnel), Kamal Sarabandi (U of Michigan), David R Smith (U of California at San Diego), Mitsuo Tateiba (Kyushu University), George Uslenghi (U of Illinois at Chicago), and Werner Wiesbeck (Karlsruhe U).

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/>

Blind Image Deconvolution

27th International Conference, ICONIP 2020, Bangkok, Thailand, November 18-22, 2020, Proceedings, Part IV

2018 Twenty Fourth National Conference on Communications (NCC)

4th International Conference, AIST 2015, Yekaterinburg, Russia, April 9-11, 2015, Revised Selected Papers

Science. A.

15th International Conference, ACIVS 2013, Poznań, Poland, October 28-31, 2013, Proceedings

Selected Proceedings of the 4th International Conference Nanotechnology and Nanomaterials (NANO2016), August 24-27, 2016, Lviv, Ukraine

Optical methods of measurements are the most sensitive techniques of noncontact investigations, and at the same time, they are fast as well as accurate which increases reproducibility of observed results. In recent years, the importance of optical interferometry methods for research has dramatically increased, and applications range from precise surface testing to finding extrasolar planets. This book covers various aspects of optical interferometry including descriptions of novel apparatuses and methods, application interferometry for studying biological objects, surface qualities, materials characterization, and optical testing. The book includes a series of chapters in which experts share recent progress in interferometry through original research and literature reviews.

Publishes papers reporting on research and development in optical science and engineering and the practical applications of known optical science, engineering, and technology.

This volume contains the papers presented at the Scandinavian Conference on Image Analysis, SCIA 2009, which was held at the Radisson SAS Scandinavian Hotel, Oslo, Norway, June 15-18. SCIA 2009 was the 16th in the biennial series of conferences, which has been organized in turn by the Scandinavian countries Sweden, Finland, Denmark and Norway since 1980. The event itself has always attracted participants and author contributions from outside the Scandinavian countries, making it an international conference. The conference included a full day of tutorials and keynote talks provided by world-renowned experts. The program covered high-quality scientific contributions within image analysis, human and action analysis, pattern and object recognition, color imaging and quality, medical and biomedical applications, face and head analysis, computer vision, and multispectral color analysis. The papers were carefully selected based on at least two reviews. Among 154 submissions 79 were accepted, leading to an acceptance rate of 51%. Since SCIA was arranged as a single-track event, 30 papers were presented in the oral sessions and 49 papers were presented in the poster sessions. A separate session on multispectral color science was organized in cooperation with the 11th Symposium of Multispectral Color Science (MCS 2009). Since 2009 was proclaimed the "International Year of Astronomy" by the United Nations General Assembly, the conference also contained a session on the topic "Image and Pattern Analysis in Astronomy and Astrophysics." SCIA has a reputation of having a friendly environment, in addition to high-quality scientific contributions. We focused on maintaining this

reputation, by designing a technical and social program that we hope the participants found interesting and inspiring for new research ideas and network extensions. We thank the authors for submitting their valuable work to SCIA.

The main objective of the ICITMS 2012 is to provide a platform for researchers, engineers, academics and industrial professionals from all over the world to present their research results and development activities in Information Technology and Management Science. This conference provides opportunities for the delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration.

Computer Processing of Remotely-Sensed Images

Handbook of Optical Metrology

Optical Measurements, Modeling, and Metrology, Volume 5

Single and Multicomponent Digital Optical Signal Analysis

Advances in Speckle Metrology and Related Techniques

Environmental Information Systems: Concepts, Methodologies, Tools, and Applications

Neural Information Processing

Optical Measurements, Modeling, and Metrology represents one of eight volumes of technical papers presented at the Society for Experimental Mechanics Annual Conference on Experimental and Applied Mechanics, held at Uncasville, Connecticut, June 13-16, 2011. The full set of proceedings also includes volumes on Dynamic Behavior of Materials, Mechanics of Biological Systems and Materials, Mechanics of Time-Dependent Materials and Processes in Conventional and Multifunctional Materials; MEMS and Nanotechnology; Experimental and Applied Mechanics, Thermomechanics and Infra-Red Imaging, and Engineering Applications of Residual Stress.

This book maximizes reader insights into the field of mathematical models and methods for the processing of two-dimensional remote sensing images. It presents a broad analysis of the field, encompassing passive and active sensors, hyperspectral images, synthetic aperture radar (SAR), interferometric SAR, and polarimetric SAR data. At the same time, it addresses highly topical subjects involving remote sensing data types (e.g., very high-resolution images, multiangular or multiresolution data, and satellite image time series) and analysis methodologies (e.g., probabilistic graphical models, hierarchical image representations, kernel machines, data fusion, and compressive sensing) that currently have primary importance in the field of mathematical modelling for remote sensing and image processing. Each chapter focuses on a particular type of remote sensing data and/or on a specific methodological area, presenting both a thorough analysis of the previous literature and a methodological and experimental discussion of at least two advanced mathematical methods for information extraction from remote sensing data. This organization ensures that both tutorial information and advanced subjects are covered. With each chapter being written by research scientists from (at least) two different institutions, it offers multiple professional experiences and perspectives on each subject. The book also provides expert analysis and commentary from leading remote sensing and image processing researchers, many of whom serve on the editorial boards of prestigious international journals in these fields, and are actively involved in international scientific societies. Providing the reader with a comprehensive picture of the overall advances and the current cutting-edge developments in the field of mathematical models for remote sensing image analysis, this book is ideal as both a reference resource and a textbook for graduate and doctoral students as well as for remote sensing scientists and practitioners.

This book is intended to attract the attention of practitioners and researchers in the academia and industry interested in challenging paradigms of wavelets and its application with an emphasis on the recent technological developments. All the chapters are well demonstrated by various researchers around the world covering the field of mathematics and applied engineering. This book highlights the current research in the usage of wavelets in different areas such as biomedical analysis, fringe-pattern analysis, image applications, network data transfer applications, and optical measurement techniques. The entire work available in the book is mainly focusing on researchers who can do quality research in the area of the usage of wavelets in related fields. Each chapter is an independent research, which will definitely motivate the young researchers to ponder on. These 12 chapters available in four sections will be an eye opener for all who are doing systematic research in these fields.

In continuation of the FRINGE Workshop Series this Proceeding contains all contributions presented at the 7. International Workshop on Advanced Optical Imaging and Metrology. The FRINGE Workshop Series is dedicated to the presentation, discussion and dissemination of recent results in Optical Imaging and Metrology. Topics of particular interest for the 7. Workshop are: - New methods and tools for the generation, acquisition, processing, and evaluation of data in Optical Imaging and Metrology (digital wavefront engineering, computational imaging, model-based reconstruction, compressed sensing, inverse problems solution) - Application-driven technologies in Optical Imaging and Metrology (high-resolution, adaptive, active, robust, reliable, flexible, in-line, real-time) - High-dynamic range solutions in Optical Imaging and Metrology (from macro to nano) - Hybrid technologies in Optical Imaging and Metrology (hybrid optics, sensor and data fusion, model-based solutions, multimodality) - New optical sensors, imaging and measurement systems (integrated, miniaturized, in-line, real-time, traceable, remote) Special emphasis is put on new strategies, taking into account the active combination of physical modeling, computer aided simulation and experimental data acquisition. In particular attention is directed towards new approaches for the extension of existing resolution limits that open the gates to wide-scale metrology, ranging from macro to nano, by considering dynamic changes and using advanced optical imaging and sensor systems.

Computer Vision □ ECCV 2016

Proceedings of the 2011 Annual Conference on Experimental and Applied Mechanics

Theory, Algorithms, and Software

Innovative Techniques and Applications of Modelling, Identification and Control

Optical Engineering

Proceedings of 2nd International Conference on Computer Vision & Image Processing

Wave Propagation, Scattering And Emission In Complex Media

The brain is the most complex computational device we know, consisting of highly interacting and redundant networks of areas, supporting specific brain functions. The rules by which these areas organize themselves to perform specific computations have only now started to be uncovered. Advances in non-invasive neuroimaging technologies have revolutionized our understanding of the functional anatomy of cortical circuits in health and disease states, which is the focus of this book. The first section of this book focuses on methodological issues, such as combining functional MRI technology with other brain imaging modalities. The second section examines the application of brain neuroimaging to understand cognitive, visual, auditory, motor and decision-making networks, as well as neurological diseases. The use of non-invasive neuroimaging technologies will continue to stimulate an exponential growth in understanding basic brain processes, largely as a result of sustained advances in neuroimaging methods and applications.

Magnetic resonance elastography (MRE) is a medical imaging technique that combines magnetic resonance imaging (MRI) with mechanical vibrations to generate maps of viscoelastic properties of biological tissue. It serves as a non-invasive tool to detect and quantify mechanical changes in tissue structure, which can be symptoms or causes of various diseases. Clinical and research applications of MRE include staging of liver fibrosis, assessment of tumor stiffness and investigation of neurodegenerative diseases. The first part of this book is dedicated to the physical and technological principles underlying MRE, with an introduction to MRI physics, viscoelasticity theory and classical waves, as well as vibration generation, image acquisition and viscoelastic parameter reconstruction. The second part of the book focuses on clinical applications of MRE to various organs. Each section starts with a discussion of the specific properties of the organ, followed by an extensive overview of clinical and preclinical studies that have been performed, tabulating reference values from published literature. The book is

completed by a chapter discussing technical aspects of elastography methods based on ultrasound.

Blind image deconvolution is constantly receiving increasing attention from the academic as well the industrial world due to both its theoretical and practical implications. The field of blind image deconvolution has several applications in different areas such as image restoration, microscopy, medical imaging, biological imaging, remote sensing, astronomy, nondestructive testing, geophysical prospecting, and many others. Blind Image Deconvolution: Theory and Applications surveys the current state of research and practice as presented by the most recognized experts in the field, thus filling a gap in the available literature on blind image deconvolution. Explore the gamut of blind image deconvolution approaches and algorithms that currently exist and follow the current research trends into the future. This comprehensive treatise discusses Bayesian techniques, single- and multi-channel methods, adaptive and multi-frame techniques, and a host of applications to multimedia processing, astronomy, remote sensing imagery, and medical and biological imaging at the whole-body, small-part, and cellular levels. Everything you need to step into this dynamic field is at your fingertips in this unique, self-contained masterwork. For image enhancement and restoration without a priori information, turn to Blind Image Deconvolution: Theory and Applications for the knowledge and techniques you need to tackle real-world problems.

This book constitutes the thoroughly refereed proceedings of the 15th International Conference on Advanced Concepts for Intelligent Vision Systems, ACIVS 2013, held in Poznań, Poland, in October 2013. The 63 revised full papers were carefully selected from 111 submissions. The topics covered are acquisition, pre-processing and coding, biometry, classification and recognition, depth, 3D and tracking, efficient implementation and frameworks, low level image analysis, segmentation and video analysis.

Physical Background and Medical Applications

An Introduction

Principles and Applications

16th International Conference, WASA 2021, Nanjing, China, June 25–27, 2021, Proceedings, Part I

16th Scandinavian Conference, SCIA 2009, Oslo, Norway, June 15-18, Proceedings

Fringe 2013

Magnetic Resonance Elastography

Remote sensing is the acquisition of information of an object or phenomenon, by the use of either recording or real-time sensing device(s), that is not in physical or intimate contact with the object (such as by way of aircraft, spacecraft, satellite, buoy, or ship). In practice, remote sensing is the stand-off collection through the use of a variety of devices for gathering information on a given object or area. Human existence is dependent on our ability to understand, utilize, manage and maintain the environment we live in - Geoscience is the science that seeks to achieve these goals. This book is a collection of contributions from world-class scientists, engineers and educators engaged in the fields of geoscience and remote sensing. This book presents the most important findings from the 9th International Conference on Modelling, Identification and Control (ICMIC'17), held in Kunming, China on July 10–12, 2017. It covers most aspects of modelling, identification, instrumentation, signal processing and control, with a particular focus on the applications of research in multi-agent systems, robotic systems, autonomous systems, complex systems, and renewable energy systems. The book gathers thirty comprehensively reviewed and extended contributions, which help to promote evolutionary computation, artificial intelligence, computation intelligence and soft computing techniques to enhance the safety, flexibility and efficiency of engineering systems. Taken together, they offer an ideal reference guide for researchers and engineers in the fields of electrical/electronic engineering, mechanical engineering and communication engineering. In recent years, complex-valued neural networks have widened the scope of application in optoelectronics, imaging, remote sensing, quantum neural devices and systems, spatiotemporal analysis of physiological neural systems, and artificial neural information processing. In this first-ever book on complex-valued neural networks, the most active scientists at the forefront of the field describe theories and applications from various points of view to provide academic and industrial researchers with a comprehensive understanding of the fundamentals, features and prospects of the powerful complex-valued networks.

In recent decades, optical techniques such as electronic speckle pattern interferometry, holographic interferometry, and fringe projection have emerged as the prominent tools for non-contact measurements. These methods have found applications in diverse areas ranging from biology to materials science, with examples including materials inspection and characterization; non-destructive testing and evaluation; flow visualization; surface profilometry; and biomechanics. In all of these processes, information about the measured physical quantity such as deformation, strain, profile, and refractive index is stored in the phase or associated derivatives of an interference fringe pattern. Consequently, a reliable estimation of phase and its derivatives, commonly referred to as fringe analysis becomes a primary requirement for the application and interpretation of these optical techniques. This book presents a review of the tools and methods of multicomponent fringe analysis and interferometric data. In addition, the authors also outline a wide range of digital signal-processing-based interferometric data-processing techniques to address the problem of accurate estimation of phase and phase derivatives with a particular focus on the simultaneous estimation of multiple phase and phase derivatives from a single frame of the interference field. The authors provide numerical simulations and practical examples to confirm the feasibility, effectiveness and accuracy of the methods described. The book focuses on overview of concepts, attracting current research attention, by: Adopting a digital signal processing approach to spatial and temporal fringe demodulation. Offering innovative solutions for the demodulation of multicomponent signals. Proposing a range of ground breaking avenues for estimating simultaneously multiple phase components. Providing a range of methods for the simultaneous estimation of multiple phase

derivatives of first order; and as well the single-phase derivatives of arbitrary order p . A strong focus on key topics of interest such as closed fringe demodulation; and fringe denoising and phase unwrapping operations.

Analysis of Images, Social Networks and Texts

25-28 Feb. 2018

Theories and Applications

2012 International Conference on Information Technology and Management Science(ICITMS 2012)

Proceedings

Emerging Trends in ICT for Sustainable Development

Global Optimization, Parallelization and Performance Evaluation

7th International Workshop on Advanced Optical Imaging and Metrology

This book is for those who have some knowledge of optics, but little or no previous experience in interferometry. A carefully designed presentation helps readers easily find and assimilate the interferometric techniques they need for measurements. Mathematics is held to a minimum, and the topics covered are also summarized in capsule overviews at the beginning and end of each chapter. Each chapter also contains a set of worked problems that give a feel for numbers. The first five chapters present a clear tutorial review of fundamentals. Chapters six and seven discuss the types of lasers and their use in interferometry. The next eight chapters describe key applications of interferometry: measurements of length, surface testing, studies of refractive index fields, interference microscopy, holographic and speckle interferometry, interferometric sensors, interference spectroscopy, and Fourier-transform spectroscopy. The final chapter offers suggestions on choosing and setting up an interferometer.

This book constitutes the proceedings of the Fourth International Conference on Analysis of Images, Social Networks and Video (AIST 2015), held in Yekaterinburg, Russia, in April 2015. The 24 full and 8 short papers were carefully reviewed and selected from 140 submissions. The papers are organized in topical sections on analysis of images and videos; pattern recognition; machine learning; social network analysis; text mining and natural language processing.

Computer Vision in Medical Imaging

Complex-valued Neural Networks

Journal of Zhejiang University

Models and Methods for the Analysis of 2D Satellite and Aerial Images

Algorithms for Three-dimensional Time-of-flight Imaging

Image Analysis and Recognition