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Introduction to Sensors for Ranging and Imaging - Graham Brooker 2009-06-30
This comprehensive textbook and reference provides a solid background in active sensing technology. Beginning with an introduction to signal generation, filtering, and modulation, it goes through the derivation of the radar range equation, fundamental to the understanding of radar, sonar, and lidar.
Applied Hydrogeology of Fractured Rocks - B.B.S. Singhal † 2013-11-11
Hydrology is a topical and growing subject, as the earth's water resources become scarcer and more vulnerable. Although more than half the surface area of continents is covered with hard fractured rocks, there has until now been no single book available dealing specifically with fractured rock hydrogeology. This book deals comprehensively with the fundamental principles for understanding these rocks, as well as with exploration techniques and assessment. It also provides in-depth discussion of structural mapping, remote sensing, geophysical exploration, GIS, field hydraulic testing, groundwater quality and contamination, geothermal reservoirs, and resources assessment and management. Hydrogeological aspects of various lithology groups, including crystalline rocks, volcanic rocks, carbonate rocks and clastic formations, are dealt with separately, using and discussing examples from all over the world. Applied Hydrogeology of Fractured Rocks will be an invaluable reference source for postgraduate students, researchers, exploration scientists, and engineers engaged in the field of groundwater development in fractured rock areas.
Advances in Machine Vision - Jorge L.C. Sanz 2012-12-06
Machine Vision technology is becoming an indispensible part of the manufacturing industry. Biomedical and scientific applications of machine vision and imaging are becoming more and more sophisticated, and new applications continue to emerge. This book gives an overview of ongoing research in machine vision and presents the key issues of scientific and practical interest. A selected board of experts from the US, Japan and Europe provides an insight into some of the latest work done on machine vision systems and appliccations.
Computer Vision and Imaging in Intelligent Transportation Systems - Robert P. Loce 2017-03-20
Acts as single source reference providing readers with an overview of how computer vision can contribute to the different applications in the field of road transportation This book presents a survey of computer vision techniques related to three key broad problems in the

roadway transportation domain: safety, efficiency, and law enforcement. The individual chapters present significant applications within those problem domains, each presented in a tutorial manner, describing the motivation for and benefits of the application, and a description of the state of the art. Key features: Surveys the applications of computer vision techniques to road transportation system for the purposes of improving safety and efficiency and to assist law enforcement. Offers a timely discussion as computer vision is reaching a point of being useful in the field of transportation systems. Available as an enhanced eBook with video demonstrations to further explain the concepts discussed in the book, as well as links to publically available software and data sets for testing and algorithm development. The book will benefit the many researchers, engineers and practitioners of computer vision, digital imaging, automotive and civil engineering working in intelligent transportation systems. Given the breadth of topics covered, the text will present the reader with new and yet unconceived possibilities for application within their communities.

Optical Phenomenology and Applications - Masoud Ghandehari 2018-05-26

This book is an introduction to techniques and applications of optical methods for materials Characterization in civil and environmental engineering. Emphasizing chemical sensing and diagnostics, it is written for students and researchers studying the physical and chemical processes in manmade or natural materials. Optical Phenomenology and Applications - Health Monitoring for Infrastructure Materials and the Environment, describes the utility of optical-sensing technologies in applications that include monitoring of transport processes and reaction chemistries in materials of the infrastructure and the subsurface environment. Many of the applications reviewed will address long standing issues in infrastructure health monitoring such as the alkali silica reaction, the role of pH in materials degradation, and the remote and inset characterization of the subsurface environment. The remarkable growth in photonics has contributed immensely to transforming bench-top optical instruments to compact field deployable systems. This has also contributed to optical sensors for environmental sensing and infrastructure health monitoring. Application of optical waveguides and full field imaging for civil and environmental engineering application is introduced and chemical and physical recognition strategies are presented; this is followed by range of filed deployable applications. Emphasizing system robustness, and long-term durability, examples covered include in-situ monitoring of transport phenomena, imaging degradation chemistries, and remote sensing of the subsurface ground water.

Introduction to Radio Engineering - Nathan Blaunstein 2016-10-14

The book introduces the basic foundations of high mathematics and vector algebra. Then, it explains the basic aspects of classical electrodynamics and electromagnetism. Based on such knowledge readers investigate various radio propagation problems related to guiding structures connecting electronic devices with antenna terminals placed at the different radar systems. It explains the role of antennas in process of transmission of radio signals between the terminals. Finally, it shows the relation between the main operational charactistics of each kind of radar and the corresponding knowledge obtained from the previous chapters.

Selected Papers on Laser Distance Measurements - Thierry Bosch 1995

SPIE Milestones are collections of seminal papers from the world literature covering important discoveries and developments in optics and photonics.

Chemische Sensoren - Peter Gründler 2006-07-01

Die Forschung und Anwendungsentwicklung in dem Bereich chemischer und biochemischer Sensoren ist weiterhin in einem schnellen Wachstum begriffen. Die Erfahrungen des letzten Jahrzehnts haben jedoch gezeigt, dass die erfolgreiche Entwicklung solcher Sensoren, die auch den harten Routinebedingungen in den vielfältigen Anwendungsgebieten widerstehen, nur dann möglich ist, wenn Chemiker und Ingenieure kooperieren. Daher ist es das Ziel dieses Lehrbuches, sowohl Chemikern als auch Ingenieuren, Lebensmittel- und Biotechnologen in einer streng systematischen aber sehr praxisorientierten Darstellung die Technologie

und die Anwendung chemischer Sensoren nahezubringen. Der interdisziplinäre Ansatz überbrückt die unterschiedlichen Denkweisen in Chemie, Physik und Ingenieurwissenschaften erfolgreich.

Selected Papers on Industrial Machine Vision Systems - Bruce G. Batchelor 1994

SPIE Milestones are collections of seminal papers from the world literature covering important discoveries and developments in optics and photonics.

Advanced Research on Intelligent Materials and Mechanical Engineering - Helen Zhang 2011-08-16

These proceedings offer original ideas and new perspectives on the topics of Intelligent Materials and Mechanical Engineering. They arose from an excellent forum within which researchers could exchange innovative ideas and new points of view. They will also provide guidance for scientists, physicists, chemists, teachers, engineers, etc., all over the world. Volume is indexed by Thomson Reuters CPCI-S (WoS).

Measurement, Instrumentation, and Sensors Handbook - John G. Webster 2017-12-19

The Second Edition of the bestselling Measurement, Instrumentation, and Sensors Handbook brings together all aspects of the design and implementation of measurement, instrumentation, and sensors. Reflecting the current state of the art, it describes the use of instruments and techniques for performing practical measurements in engineering, physics, chemistry, and the life sciences and discusses processing systems, automatic data acquisition, reduction and analysis, operation characteristics, accuracy, errors, calibrations, and the incorporation of standards for control purposes. Organized according to measurement problem, the Spatial, Mechanical, Thermal, and Radiation Measurement volume of the Second Edition: Contains contributions from field experts, new chapters, and updates to all 96 existing chapters Covers instrumentation and measurement concepts, spatial and mechanical variables, displacement, acoustics, flow and spot velocity, radiation, wireless sensors and instrumentation, and control and human factors A concise and useful reference for engineers, scientists, academic faculty, students, designers, managers, and industry professionals involved in instrumentation and measurement research and development, Measurement, Instrumentation, and Sensors Handbook, Second Edition: Spatial, Mechanical, Thermal, and Radiation Measurement provides readers with a greater understanding of advanced applications.

Robotic Navigation and Mapping with Radar - Martin Adams 2012

Focusing on autonomous robotic applications, this cutting-edge resource offer you a practical treatment of short-range radar processing for reliable object detection at the ground level. This unique book demonstrates probabilistic radar models and detection algorithms specifically for robotic land vehicles. It examines grid based robotic mapping with radar based on measurement likelihood estimation. You find detailed coverage of simultaneous localization and Map Building (SLAM) – an area referred to as the "Holy Grail" of autonomous robotic research. The book derives an extended Kalman Filter SLAM algorithm which exploits the penetrating ability of radar. This algorithm allows for the observation of visually occluded objects, as well as the usual directly observed objects, which contributes to a robot's position and the map state update. Moreover, you discover how the Random Finite Set (RFS) provides a more appropriate approach for representing radar based maps than conventional frameworks.

Introduction to Fluorescence Sensing - Alexander P. Demchenko 2020-12-01

This book provides systematic knowledge of basic principles in the design of fluorescence sensing and imaging techniques together with critical analysis of recent developments. Fluorescence is the most popular technique in chemical and biological sensing because of its ultimate sensitivity, high temporal and spatial resolution and versatility that enables imaging within the living cells. It develops rapidly in the directions of constructing new molecular recognition units, new fluorescence reporters and in improving sensitivity of response up to detection of single molecules. Its application areas range from control of industrial processes to environment monitoring and clinical diagnostics. Being a guide for students and

young researchers, it also addresses professionals involved in active basic and applied research. Making a strong link between education, research and product development, this book discusses prospects for future progress.

Electromagnetic and Acoustic Wave Tomography - Nathan Blaunstein 2018-06-14

This book discusses the development of radio-wave tomography methods as a means of remote non-destructive testing, diagnostics of the internal structure of semi-transparent media, and reconstruction of the shapes of opaque objects based on multi-angle sounding. It describes physical-mathematical models of systems designed to reconstruct images of hidden objects, based on tomographic processing of multi-angle remote measurements of scattered radio and acoustic (ultrasonic) wave radiation.

Geospatial Technologies for Land Degradation Assessment and Management - R. S. Dwivedi 2018-10-17

The constant growth of the world’s population and the decline of the availability of land and soil resources are global concerns for food security. Other concerns are the decrease in productivity and delivery of essential ecosystems services because of the decline of soil quality and health by a range of degradation processes. Key soil properties like soil bulk density, organic carbon concentration, plant available water capacity, infiltration rate, air porosity at field moisture capacity, and nutrient reserves, are crucial properties for soil functionality which refers to the capacity of soil to perform numerous functions. These functions are difficult to measure directly and are estimated through indices of soil quality and soil health. Soil degradation, its extent and severity, can also be estimated by assessing indices of soil quality and health. "Geospatial Technology for Land Degradation Assessment and Management" uses satellite imagery and remote sensing technologies to measure landscape parameters and terrain attributes. Remote sensing and geospatial technologies are important tools in assessing the extent and the severity of land and soil degradation, their temporal changes, and geospatial distribution in a timely and cost-effective manner. The knowledge presented in the book by Dr. R.S. Dwivedi shows how remote sensing data can be utilized for inventorying, assessing, and monitoring affected ecosystems and how this information can be integrated in the models of different local settings. Through many land degradations studies, land managers, researchers, and policymakers will find practical applications of geospatial technologies and future challenges. The information presented is also relevant to advancing the Sustainable Development Goals of the United Nations towards global food security.

Topographic Laser Ranging and Scanning - Jie Shan 2018-02-19

Topographic Laser Ranging and Scanning, Second Edition, provides a comprehensive discussion of topographic LiDAR principles, systems, data acquisition, and data processing techniques. This edition presents an introduction and summary of various LiDAR systems and their principles and addresses the operational principles of the different components and ranging methods of LiDAR systems. It discusses the subsequent geometric processing of LiDAR data, with particular attention to quality, accuracy, and meeting standards and addresses the theories and practices of information extraction from LiDAR data, including terrain surface generation, forest inventory, orthoimage generation, building reconstruction, and road extraction. Written by leaders in the field, this comprehensive compilation is a must-have reference book for senior undergraduate and graduate students majoring or working in diverse disciplines, such as geomatics, geodesy, natural resources, urban planning, computer vision, and computer graphics. It is also vital resource for researchers who are interested in developing new methods and need in-depth knowledge of laser scanning and data processing and other professionals may gain the same from the broad topics addressed in this book. New in the Second Edition: A comprehensive array of new laser ranging and scanning technologies. Developments in LiDAR data format and processing techniques. Regrouping of surface modeling, representations and reconstruction. Enhanced discussions on the principles and fundamentals beyond small-footprint pulsed laser systems and new application examples. Many new examples and illustrations.

Compressed Sensing and its Applications - Holger Boche 2015-07-04
Since publication of the initial papers in 2006, compressed sensing has captured the imagination of the international signal processing community, and the mathematical foundations are nowadays quite well understood. Parallel to the progress in mathematics, the potential applications of compressed sensing have been explored by many international groups of, in particular, engineers and applied mathematicians, achieving very promising advances in various areas such as communication theory, imaging sciences, optics, radar technology, sensor networks, or tomography. Since many applications have reached a mature state, the research center MATHEON in Berlin focusing on "Mathematics for Key Technologies", invited leading researchers on applications of compressed sensing from mathematics, computer science, and engineering to the "MATHEON Workshop 2013: Compressed Sensing and its Applications" in December 2013. It was the first workshop specifically focusing on the applications of compressed sensing. This book features contributions by the plenary and invited speakers of this workshop. To make this book accessible for those unfamiliar with compressed sensing, the book will not only contain chapters on various applications of compressed sensing written by plenary and invited speakers, but will also provide a general introduction into compressed sensing. The book is aimed at both graduate students and researchers in the areas of applied mathematics, computer science, and engineering as well as other applied scientists interested in the potential and applications of the novel methodology of compressed sensing. For those readers who are not already familiar with compressed sensing, an introduction to the basics of this theory will be included.

Spectral Sensing Research For Surface And Air Monitoring In Chemical, Biological And Radiological Defense And Security Applications - Jean-marc Theriault 2009-08-11
This book provides unique perspectives on the state of the art in multispectral/hyperspectral techniques for early-warning monitoring against chemical, biological and radiological (CB&R) contamination of both surface (e.g. land) and air (e.g. atmospheric) environments through the presentation of a comprehensive survey of the novel spectroscopic methodologies and technologies that are emerging to address the CB&R defense and security challenges of the future. The technical content in this book lends itself to the non-traditional requirements for point and stand-off detection that have evolved out of the US joint services programs over many years. In particular, the scientific and technological work presented seeks to enable hyperspectral-based sensing and monitoring that is in real time and in-line; low in cost and labor requirements; and easy to support, maintain and use in military and security-relevant scenarios.

Introduction to Autonomous Mobile Robots - Roland Siegwart 2004
An overview of all aspects of mobility in robotics, including software and hardware design considerations, related technologies, and algorithmic techniques.

Timing Jitter in Time-Of-Flight Range Imaging Cameras - Gehan Anthonys 2022
This book explains how depth measurements from the Time-of-Flight (ToF) range imaging cameras are influenced by the electronic timing-jitter. The author presents jitter extraction and measurement techniques for any type of ToF range imaging cameras. The author mainly focuses on ToF cameras that are based on the amplitude modulated continuous wave (AMCW) lidar techniques that measure the phase difference between the emitted and reflected light signals. The book discusses timing-jitter in the emitted light signal, which is sensible since the light signal of the camera is relatively straightforward to access. The specific types of jitter that present on the light source signal are investigated throughout the book. The book is structured across three main sections: a brief literature review, jitter measurement, and jitter influence in AMCW ToF range imaging.

Machine Vision and Advanced Image Processing in Remote Sensing - Ioannis Kanellopoulos 2012-12-06
Since 1994, the European Commission has undertaken various actions to expand the use of Earth observation (EO) from space in the Union and to stimulate value-added services based on the use of Earth observation satellite data.' By supporting research and technological

development activities in this area, DG XII responded to the need to increase the cost-effectiveness of space derived environmental information. At the same time, it has contributed to a better exploitation of this unique technology, which is a key source of data for environmental monitoring from local to global scale. MAVIRIC is part of the investment made in the context of the Environ ment and Climate Programme (1994-1998) to strengthen applied techniques, based on a better understanding of the link between the remote sensing signal and the underlying bio- geo-physical processes. Translation of this scientific know-how into practical algorithms or methods is a priority in order to con vert more quickly, effectively and accurately space signals into geographical information. Now the availability of high spatial resolution satellite data is rapidly evolving and the fusion of data from different sensors including radar sensors is progressing well, the question arises whether existing machine vision approaches could be advantageously used by the remote sensing community. Automatic feature/object extraction from remotely sensed images looks very attractive in terms of processing time, standardisation and implementation of operational processing chains, but it remains highly complex when applied to natural scenes.

Low-Power Analog Techniques, Sensors for Mobile Devices, and Energy Efficient Amplifiers - Kofi A. A. Makinwa 2019-01-28

This book is based on the 18 invited tutorials presented during the 27th workshop on Advances in Analog Circuit Design. Expert designers from both industry and academia present readers with information about a variety of topics at the frontiers of analog circuit design, including the design of analog circuits in power-constrained applications, CMOS-compatible sensors for mobile devices and energy-efficient amplifiers and drivers. For anyone involved in the design of analog circuits, this book will serve as a valuable guide to the current state-of-the-art. Provides a state-of-the-art reference in analog circuit design, written by experts from industry and academia; Presents material in a tutorial-based format; Covers the design of analog circuits in power-constrained applications, CMOS-compatible sensors for mobile devices and energy-efficient amplifiers and drivers.

21st Century Nanoscience - Klaus D. Sattler 2021-11-05

This 21st Century Nanoscience Handbook will be the most comprehensive, up-to-date large reference work for the field of nanoscience. Handbook of Nanophysics, by the same editor, published in the fall of 2010, was embraced as the first comprehensive reference to consider both fundamental and applied aspects of nanophysics. This follow-up project has been conceived as a necessary expansion and full update that considers the significant advances made in the field since 2010. It goes well beyond the physics as warranted by recent developments in the field. Key Features: Provides the most comprehensive, up-to-date large reference work for the field. Chapters written by international experts in the field. Emphasises presentation and real results and applications. This handbook distinguishes itself from other works by its breadth of coverage, readability and timely topics. The intended readership is very broad, from students and instructors to engineers, physicists, chemists, biologists, biomedical researchers, industry professionals, governmental scientists, and others whose work is impacted by nanotechnology. It will be an indispensable resource in academic, government, and industry libraries worldwide. The fields impacted by nanoscience extend from materials science and engineering to biotechnology, biomedical engineering, medicine, electrical engineering, pharmaceutical science, computer technology, aerospace engineering, mechanical engineering, food science, and beyond.

Traditional and Non-Traditional Robotic Sensors - Thomas C. Henderson 2012-12-06

This book contains the written record of the NATO Advanced Research Workshop on Traditional and Non-Traditional Robotic Sensors held in the Hotel Villa del Mare, Maratea, Italy, August 28 - September 1, 1989. This workshop was organized under the auspicies of the NATO Special Program on Sensory Systems for Robotic Control. Professor Frans Groen from the University of Amsterdam and Dr. Gert Hirzinger from the German Aerospace Research Establishment (DLR) served as members of the

organizing committee for this workshop. Research in the area of robotic sensors is necessary in order to support a wide range of applications, including: industrial automation, space robotics, image analysis, microelectronics, and intelligent sensors. This workshop focused on the role of traditional and non-traditional sensors in robotics. In particular, the following three topics were explored: - Sensor development and technology, - Multisensor integration techniques, - Application area requirements which motivate sensor development directions. This workshop'brought together experts from NATO countries to discuss recent developments in these three areas. Many new directions (or new directions on old problems) were proposed. Existing sensors should be pushed into new application domains such as medical robotics and space robotics.

Computational Science and Its Applications – ICCSA 2021 - Osvaldo Gervasi 2021-09-10

The ten-volume set LNCS 12949 – 12958 constitutes the proceedings of the 21st International Conference on Computational Science and Its Applications, ICCSA 2021, which was held in Cagliari, Italy, during September 13 – 16, 2021. The event was organized in a hybrid mode due to the Covid-19 pandemic.The 466 full and 18 short papers presented in these books were carefully reviewed and selected from 1588 submissions. Part VII of the set includes the proceedings of the following workshops: International Workshop on Geomatics for Resource Monitoring and Management (GRMM 2021); International Workshop on Geomatics in Agriculture and Forestry: new advances and perspectives (Geo-for-Agr 2021); 12th International Symposium on Software Quality (SQ 2021);10th International Workshop on Collective, Massive and Evolutionary Systems (IWCES 2021); International Workshop on Land Use monitoring for Sustainability (LUMS 2021); International Workshop on Machine Learning for Space and Earth Observation Data (MALSEOD 2021); International Workshop on Building multi-dimensional models for assessing complex environmental systems (MES 2021); International Workshop on Ecosystem Services: nature's contribution to people in practice. Assessment frameworks, models, mapping, andimplications (NC2P 2021).

Smart Sensors and MEMS - S Nihtianov 2018-03-09

Smart Sensors and MEMS: Intelligent Devices and Microsystems for Industrial Applications, Second Edition highlights new, important developments in the field, including the latest on magnetic sensors, temperature sensors and microreaction chambers. The book outlines the industrial applications for smart sensors, covering direct interface circuits for sensors, capacitive sensors for displacement measurement in the sub-nanometer range, integrated inductive displacement sensors for harsh industrial environments, advanced silicon radiation detectors in the vacuum ultraviolet (VUV) and extreme ultraviolet (EUV) spectral range, among other topics. New sections include discussions on magnetic and temperature sensors and the industrial applications of smart micro-electro-mechanical systems (MEMS). The book is an invaluable reference for academics, materials scientists and electrical engineers working in the microelectronics, sensors and micromechanics industry. In addition, engineers looking for industrial sensing, monitoring and automation solutions will find this a comprehensive source of information. Contains new chapters that address key applications, such as magnetic sensors, microreaction chambers and temperature sensors Provides an in-depth information on a wide array of industrial applications for smart sensors and smart MEMS Presents the only book to discuss both smart sensors and MEMS for industrial applications

Characteristics of Ultrasonic Ranging Sensors in an Underground Environment - William H. Strickland 1993

Foundations of Atmospheric Remote Sensing - Dmitry Efremenko 2021-05-18

Theoretical foundations of atmospheric remote sensing are electromagnetic theory, radiative transfer and inversion theory. This book provides an overview of these topics in a common context, compile the results of recent research, as well as fill the gaps, where needed. The following aspects are covered: principles of remote sensing, the atmospheric physics, foundations of the radiative transfer theory, electromagnetic absorption, scattering and propagation, review of computational techniques

in radiative transfer, retrieval techniques as well as regularization principles of inversion theory. As such, the book provides a valuable resource for those who work with remote sensing data and want to get a broad view of theoretical foundations of atmospheric remote sensing. The book will be also useful for students and researchers working in such diverse fields like inverse problems, atmospheric physics, electromagnetic theory, and radiative transfer.

Optical Imaging and Photography - Ulrich Teubner 2019-03-04

This work is concerned with optical imaging – from simple apertures to complex imaging systems. It spans the range all the way from optical physics to technical optics. For microscopists and photographers it conveys a deeper insight into the intricacies of their daily used devices. Physics and engineering students learn to understand different imaging systems and sensors as well as lenses and errors, image amplification and processing. This introduction into the topic is suitable for beginners and experienced people. It is illustrated by many practical examples and may also be used as a work of reference. The book is useful for everyone employing and assessing imaging systems in general. A special focus is given to photo camera systems.

Face Recognition Across the Imaging Spectrum - Thirimachos Bourlai 2019-03-21

This authoritative text/reference presents a comprehensive review of algorithms and techniques for face recognition (FR), with an emphasis on systems that can be reliably used in operational environments. Insights are provided by an international team of pre-eminent experts into the processing of multispectral and hyperspectral face images captured under uncontrolled environments. These discussions cover a variety of imaging sensors ranging from state-of-the-art visible and infrared imaging sensors, to RGB-D and mobile phone image sensors. A range of different biometric modalities are also examined, including face, periocular and iris. This timely volume is a mine of useful information for researchers, practitioners and students involved in image processing, computer vision, biometrics and security.

Introduction to Human Neuroimaging - Hans Op de Beeck 2019-05-16

An accessible primer for courses on human neuroimaging methods, with example research studies, color figures, and practice questions.

21st Century Nanoscience - A Handbook - Klaus D. Sattler 2020-04-02

This up-to-date reference is the most comprehensive summary of the field of nanoscience and its applications. It begins with fundamental properties at the nanoscale and then goes well beyond into the practical aspects of the design, synthesis, and use of nanomaterials in various industries. It emphasizes the vast strides made in the field over the past decade – the chapters focus on new, promising directions as well as emerging theoretical and experimental methods. The contents incorporate experimental data and graphs where appropriate, as well as supporting tables and figures with a tutorial approach.

Computer Vision: Principles - Rangachar Kasturi 1991

Together, these books two volumes of Computer Vison "Principles" and "Advances and Applications," constitute a tutorial, a guide to practical applications, and a reference source on recent advances in computer vision research. The tutorial component will benefit students and professionals who are relatively new to the computer vision field. The description of practical applications of machine vision technology will act as a guide to practicing engineers. And the collection of papers on recent research advances will be an excellent reference source for active researchers in the computer vision field. We believe that the ideas and techniques described in these two books will continue to influence vision system research and design for many years to come.

TOF Range-Imaging Cameras - Fabio Remondino 2013-04-09

Today the cost of solid-state two-dimensional imagers has dramatically dropped, introducing low cost systems on the market suitable for a variety of applications, including both industrial and consumer products. However, these systems can capture only a two-dimensional projection (2D), or intensity map, of the scene under observation, losing a variable of paramount importance, i.e., the arrival time of the impinging photons. Time-Of-Flight (TOF) Range-

Imaging (TOF) is an emerging sensor technology able to deliver, at the same time, depth and intensity maps of the scene under observation. Featuring different sensor resolutions, RIM cameras serve a wide community with a lot of applications like monitoring, architecture, life sciences, robotics, etc. This book will bring together experts from the sensor and metrology side in order to collect the state-of-art researchers in these fields working with RIM cameras. All the aspects in the acquisition and processing chain will be addressed, from recent updates concerning the photo-detectors, to the analysis of the calibration techniques, giving also a perspective onto new applications domains.

Sensors in Medicine and Health Care - P. Ake Oberg 2006-03-06

Taken as a whole, this series covers all major fields of application for commercial sensors, as well as their manufacturing techniques and major types. As such the series does not treat bulk sensors, but rather places strong emphasis on microsensors, microsystems and integrated electronic sensor packages. Each of the individual volumes is tailored to the needs and queries of readers from the relevant branch of industry. A review of applications for point-of-care diagnostics, their integration into portable systems and the comfortable, easy-to-use sensors that allow patients to monitor themselves at home. The book covers such advanced topics as minimal invasive surgery, implantable sensors and prostheses, as well as biocompatible sensing.

New Developments and Applications in Sensing Technology - Subhas Chandra Mukhopadhyay 2011-01-22

This book has focussed on different aspects of smart sensors and sensing technology, i.e. intelligent measurement, information processing, adaptability, recalibration, data fusion, validation, high reliability and integration of novel and high performance sensors in the areas of magnetic, ultrasonic, vision and image sensing, wireless sensors and network, microfluidic, tactile, gyro, flow, surface acoustic wave, humidity and ultra-wide band. While future interest in this field is ensured by the constant supply of emerging modalities, techniques and engineering solutions, as well as an increasing need from aging structures, many of the basic concepts and strategies have already matured and now offer opportunities to build upon. The book has primarily been focussed for postgraduate and research students working on different aspects of design and developments of smart sensors and sensing technology.

Face Recognition Across the Imaging Spectrum - Thirimachos Bourlai 2016-02-12

This authoritative text/reference presents a comprehensive review of algorithms and techniques for face recognition (FR), with an emphasis on systems that can be reliably used in operational environments. Insights are provided by an international team of pre-eminent experts into the processing of multispectral and hyperspectral face images captured under uncontrolled environments. These discussions cover a variety of imaging sensors ranging from state-of-the-art visible and infrared imaging sensors, to RGB-D and mobile phone image sensors. A range of different biometric modalities are also examined, including face, periocular and iris. This timely volume is a mine of useful information for researchers, practitioners and students involved in image processing, computer vision, biometrics and security.

Introduction to Embedded Systems, Second Edition - Edward Ashford Lee 2016-12-30

An introduction to the engineering principles of embedded systems, with a focus on modeling, design, and analysis of cyber-physical systems. The most visible use of computers and software is processing information for human consumption. The vast majority of computers in use, however, are much less visible. They run the engine, brakes, seatbelts, airbag, and audio system in your car. They digitally encode your voice and construct a radio signal to send it from your cell phone to a base station. They command robots on a factory floor, power generation in a power plant, processes in a chemical plant, and traffic lights in a city. These less visible computers are called embedded systems, and the software they run is called embedded software. The principal challenges in designing and analyzing embedded systems stem from their interaction with physical processes. This book takes a cyber-physical approach to

embedded systems, introducing the engineering concepts underlying embedded systems as a technology and as a subject of study. The focus is on modeling, design, and analysis of cyber-physical systems, which integrate computation, networking, and physical processes. The second edition offers two new chapters, several new exercises, and other improvements. The book can be used as a textbook at the advanced undergraduate or introductory graduate level and as a professional reference for practicing engineers and computer scientists. Readers should have some familiarity with machine structures, computer programming, basic discrete mathematics and algorithms, and signals and systems.

Smart Imaging Systems - Bahram Javidi 2001

This book presents recent advances in image sensing and processing systems, image recognition, 3D imaging and processing, ultrafast optical networks for image communication, and multidimensional information security systems. Eleven chapters by international experts provide practical and theoretical insights. Useful for students, researchers, and technology users in IT, image processing, and optics.

Introduction to Modern Photogrammetry - Edward M. Mikhail 2001-03-26

This text is designed to give students a strong grounding in the mathematical basis of photogrammetry while introducing them to related fields, such as remote sensing and digital image processing. Suitable for undergraduate photogrammetry courses typically aimed at junior and senior students, and for graduate-level courses at the Master's level. Excellent reference for those working in related fields.