Chapter 11 Digital Image Processing Jensen

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Remote Sensing Geology Ravi P. Gupta 2013-06-29 For nearly three decades there has been a phenomenal growth in the field of Remote Sensing. The second edition of this widely acclaimed book has been fully revised and updated. The reader will find a wide range of information on various aspects of geological remote sensing, ranging from laboratory spectra of minerals and rocks, ground truth, to aerial and space-borne remote sensing. This volume describes the integration of photogeology into remote sensing as well as how remote sensing is used as a tool of geo-exploration. It also covers a wide spectrum of geoscientific applications of remote sensing ranging from meso- to global scale. The subject matter is presented at a basic level, serving students as an introductory text on remote sensing. The main part of the book will also be of great value to active researchers.
The History of Geographic Information Systems Timothy W. Foresman 1998 These authors' contributions helped bring to national, state, and federal agencies the powerful new suite of geospatial tools for issues ranging from land use management to population enumeration."--BOOK JACKET.
Geospatial Tools for Urban Water Resources Patrick L. Lawrence 2012-09-04 This book examines the application of geotechniques to address a wide range of issues facing urban water resources. Growing populations leading to urbanization and related development have lead to problems associated with water quality, storm water management, flood control, environmental health, and related ecosystem impacts. Major cities and other urban areas are facing challenges in addressing the implications of impacts to water resources. Recent innovations in geotechnologies, including Geographic Information Science (GIS), remote sensing, and other spatial tools and techniques, provide great opportunities and potential to assist in dealing with these problems. This volume provides a series of case studies that examine the application of new methods and approaches in a range of geotechnologies as utilized to better understand and resolve urban water resource concerns in communities throughout the world. Computer based mapping, spatial analysis, satellite imagery, decision support systems, web based applications, aerial photography, and other methods are highlighted by their development and application. The research presented in this volume will provide for an excellent source of knowledge and learning to assist professionals, experts, and students with a better understanding of how the use of geotechnologies can be used to assist urban communities to address water resource challenges.
Spatial Information Science for Natural Resource Management Singh, Suraj Kumar 2020-06-26 Stress on natural resources has recently increased due to commercialization and the need to provide livelihoods for locals. Because they are such core parts of everyday life, ensuring sustainability in resource management is of paramount importance. Only by integrating the tools of spatial information science can an effective course for preserving and protecting natural resources be created. Spatial Information Science for Natural Resource Management is a pivotal reference source that explores coordinated approaches to sustainable development and management of natural resources to keep a balance of the environment, ecology, and human livelihood. Featuring coverage on a wide range of topics including crop yield estimation, ecosystem services, and land information systems, this book covers interdisciplinary techniques in monitoring and managing natural resources. This publication is ideally designed for urban planners, environmentalists, policymakers, ecologists, researchers, academicians, students, and professionals in the fields of remote sensing, civil engineering, social science, computer science, and information technology.
Image Processing Algorithms and Techniques 1991
Development of Input Data Layers for the FARSITE Fire Growth Model for the Selway-Bitterroot Wilderness Complex, USA Robert E. Keane 1998 Fuel and vegetation spatial data layers required by the spatially explicit fire growth model FARSITE were developed for all langs in and around the Selway-Bitterroot Wilderness Area in Idaho and Montana. Satellite imagery and terrain modeling were used to create the three base vegetation spatial data layers of potential vegetation, cover type, and structural stage. Fire behavior fuel models and crown characteristics were assigned to combinations of base layer categories on these maps by local fire managers, ecologists, and existing data. FARSITE fuels maps are used to simulate growth of prescribed natural fires in the wilderness area, aiding managers in the planning and allocation of resources. An extensive accuracy assessment of all maps indicated fuels layers are about 60 percent accurate. This methodology was designed to be replicated for other areas.
Digital Radiography Euclid Seeram 2019-01-23 This is the second edition of a well-received book that enriches the understanding of radiographers and radiologic technologists across the globe, and is designed to meet the needs of courses (units) on radiographic imaging equipment, procedures, production, and exposure. The book also serves as a supplement for courses that address digital imaging techniques, such as radiologic physics, radiographic equipment and quality control. In a broader sense, the purpose of the book is to meet readers' needs in connection with the change from film-based imaging to film-less or digital imaging; today, all radiographic imaging worldwide is based on digital imaging technologies. The book covers a wide range of topics to address the needs of members of various professional radiologic technology associations, such as the American Society of Radiologic Technologists, the Canadian Association of Medical Radiation Technologists, the College of Radiographers in the UK, and the Australian and New Zealand Societies for Radiographers.
Remote Sensing of Global Croplands for Food Security Prasad Thenkabail 2009-06-24 Increases in populations have created an increasing demand for food crops while increases in demand for biofuels have created an increase in demand for fuel crops. What has not increased is the amount of croplands and their productivity. These and many other factors such as decreasing water resources in a changing climate have created a crisis like situation in global food security. Decision makers in these situations need accurate information based on science. Remote Sensing of Global Croplands for Food Security provides a comprehensive knowledge base in use of satellite sensor-based maps and statistics that can be used to develop strategies for croplands (irrigated and rainfed) and their water use for food security. Over 50 Multi-disciplinary Global Experts Give Insight and Provide Practical Approaches Emphasizing practical mapping technologies based on advanced remote sensing data and methods, this book provides approaches for estimating

irrigated and rainfed cropland areas and their water use on a national, continental, or global basis. Written by 50+ leading experts working at the forefront of this critical area, it offers case studies from a variety of continents highlighting the subtle requirements of each. In a very practical way it demonstrates the experience, utility, and models for determining water resources used and resulting yields of irrigated and rainfed croplands. The authors discuss: (a) innovative methods used for mapping croplands, (b) approaches adopted to collect cropland data in different countries by traditional and non-traditional means, (c) accuracies, uncertainties, and errors involved in producing cropland products, (d) surface energy balance models used to assess crop water use, and (e) extensive results and outcomes pertaining to global croplands and their water use. Develop Strategies for an Enhanced Green Revolution and an Accelerated Blue Revolution Linking croplands to water use and food security, the book provides a global perspective on this sensitive issue. It gives insight into the extent of cropland usage, their spatial distribution, their cropping intensities, and their water use patterns. The editors collect the experience, methods, models, and results that show the way forward and help in decision-making on water resources and food security. All of this is required for developing strategies for an enhanced green revolution and for an accelerated blue revolution.

Advances in Communication Systems and Electrical Engineering He Huang 2008-02-02 This volume contains contributions from participants in the 2007 International Multiconference of Engineers and Computer Scientists. It covers a variety of subjects in the frontiers of intelligent systems and computer engineering and their industrial applications. The book reflects the tremendous advances in communication systems and electrical engineering. The book provides an excellent reference work for researchers and graduate students working in the field.

Fundamentals of Remote Sensing George Joseph 2005 This book presents the fundamental concepts covering various stages of remote sensing from data collection to end utilization, so that it can be appreciated irrespective of the discipline in which the reader has graduated. The physical principles on which remote sensing are based has been explained without getting into complicated mathematical equations.

Earth Observation for Flood Applications Guy J-P. Schumann 2021-05-21 Earth Observation for Flood Applications: Progress and Perspectives describes the latest scientific advances in Earth Observation. With recent floods around the world becoming ever more devastating, there is a need for better science enabling more effective solutions at a fast pace. This book aims at stretching from the current flood mapping to diverse real data so as to estimate the flood risk and damage. Earth Observation for Flood Applications: Progress and Perspectives includes three parts containing each a separate but complementary topic area under floods. Each chapter unfolds various applications, case studies, and illustrative graphics. In terms of flood mapping and monitoring, the usage of multi-sensor satellite data, web-services information, microwave remote sensing methods are discussed in depth. So, this book is a valuable resource for scientists, researchers, and students in the area of earth observation. Focuses in on one specific application field of Earth Observation Brings the latest scientific advances and perspectives from experts around the world Includes extensive figures, tables, and case studies to illustrate real-life applications

Land Resources Monitoring, Modeling, and Mapping with Remote Sensing Ph.D., Prasad S. Thenkabail 2015-10-02 A volume in the three-volume Remote Sensing Handbook series, Land Resources Monitoring, Modeling, and Mapping with Remote Sensing documents the scientific and methodological advances that have taken place during the last 50 years. The other two volumes in the series are Remotely Sensed Data Characterization, Classification, and Accuracies, and Remo

Integrating Ecosystem Sampling, Gradient Modeling, Remote Sensing, and Ecosystem Simulation to Create Spatially Explicit Landscape Inventories Robert E. Keane 2002

Hydropedology Henry Lin 2012-07-09 Hydropedology is a microcosm for what is happening in Soil Science. Once a staid discipline found in schools of agriculture devoted to increasing crop yield, soil science is transforming itself into an interdisciplinary mulch with great significance not only for food production but also climate change, ecology, preservation of natural resources, forestry, and carbon sequestration. Hydropedology brings together pedology (soil characteristics) with hydrology (movement of water) to understand and achieve the goals now associated with modern soil science. The first book of its kind in the market Highly interdisciplinary, involving new thinking and synergistic approaches Stimulating case studies demonstrate the need for hydropedology in various practical applications Future directions and new approaches are present to advance this emerging interdisciplinary science

Remote Sensing and Image Interpretation Thomas M. Lillesand 1994-01-27 Intended for introductory courses in remote sensing offered by departments of geography, engineering, forestry or geology, this text surveys photographic techniques and applies them to various fields. It also explores the interpretation of data collected by other types of sensors.

Environmental Hydrology, Second Edition Andy D. Ward 2003-12-18 The technological advances of recent years include the emergence of new remote sensing and geographic information systems that are invaluable for the study of wetlands, agricultural land, and land use change. Students, hydrologists, and environmental engineers are searching for a comprehensive hydrogeologic overview that supplements information on hydrologic processes with data on these new information technology tools. Environmental Hydrology, Second Edition builds upon the foundation of the bestselling first edition by providing a qualitative understanding of hydrologic processes while introducing new methods for quantifying hydrologic parameters and processes. Written by authors with extensive multidisciplinary experience, the text first discusses the components of the hydrologic cycle, then follows with chapters on precipitation, stream processes, human impacts, new information system applications, and numerous other methods and strategies. By updating this thorough text with the newest analytical tools and measurement methodologies in the field, the authors provide an ideal reference for students and professionals in environmental science, hydrology, soil science, geology, ecological engineering, and countless other environmental fields.

Geoecology of Landscape Dynamics Seema Sahdev 2020-03-03 This book provides an overview of the ecological indicators of landscape dynamics in the context of geographical landscape integration. Landscape dynamics depicts every change that occurs in the physical, biological, and cognitive assets of a landscape. To understand and interpret the complex physical, biological, and cognitive phenomena of landscapes, it is necessary to operate conceptually and practically on a broad range of spatial and temporal scales. Rapid land use changes have become a concern to environmentalists and planners because of their impacts on the natural ecosystem, which further determines socioeconomic dynamics. In this regard, the book discusses case studies that share new insights into how landscape patterns and processes impact small creatures, and how small creatures in turn influence landscape structure and composition. In turn, the relevant aspects of land use and land cover dynamics are covered, and the multi-faceted relationship between the substrata and ecological community is highlighted. The book is unique in its focus on the application of spatial informatics such as automatic building extraction from high-resolution imagery; a soil resource inventory for meeting the challenges of land degradation; hydrological modeling; the temporal variation analysis of glacier area and the identification and mapping of glacial lakes; morphometric analysis of river basins; and the monitoring and modeling of urban sprawl, among other features.

Remote Sensing J D Greer 1996-09-30

Introductory Digital Image Processing John R. Jensen 2005 For junior/graduate-level courses in Remote Sensing in Geography, Geology, Forestry, and Biology. This revision of Introductory Digital Image Processing: A Remote Sensing Perspective continues to focus on digital image processing of aircraft- and satellite-derived, remotely sensed data for Earth resource management applications. Extensively illustrated, it explains how to extract biophysical information from remote sensor

data for almost all multidisciplinary land-based environmental projects. Part of the Prentice Hall Series Geographic Information Science.

Advanced Imaging Techniques Thomas H. Newton 1983

Electronic Engineering and Computing Technology Len Gelman 2010-04-21 Electronic Engineering and Computing Technology contains sixty-one revised and extended research articles written by prominent researchers participating in the conference. Topics covered include Control Engineering, Network Management, Wireless Networks, Biotechnology, Signal Processing, Computational Intelligence, Computational Statistics, Internet Computing, High Performance Computing, and industrial applications. Electronic Engineering and Computing Technology will offer the state of art of tremendous advances in electronic engineering and computing technology and also serve as an excellent reference work for researchers and graduate students working with/on electronic engineering and computing technology.

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

Remote Sensing Handbook - Three Volume Set Prasad Thenkabail 2018-10-03 A volume in the three-volume Remote Sensing Handbook series, Remote Sensing of Water Resources, Disasters, and Urban Studies documents the scientific and methodological advances that have taken place during the last 50 years. The other two volumes in the series are Remotely Sensed Data Characterization, Classification, and Accuracies, and Land Reso

IGARSS 2004 2004

Remote Sensing Tools for Exploration Pamela Elizabeth Clark 2010-07-01 Remote Sensing from a New Perspective The idea for this book began many years ago, when I was asked to teach a course on remote sensing. Not long before that time, I had been part of the effort to develop the first database for planetary data with a common digital array format and interactive processing capabilities to correlate those data easily: the lunar consortium. All the available lunar remote sensing data were included, orbital and ground-based, ranging across the entire electromagnetic spectrum. I had used this powerful tool extensively, and, in that spirit, I was determined to create a course which covered the entire spectrum and a variety of targets. As I looked around for the equivalent of a textbook, which I was willing to pull together from several sources, I realized that available material was very heavily focused on the visual and near visual spectrum and on the Earth as a target. Even The Surveillant Science, edited by Edward Holz and published in 1973, which broke new ground in having diverse articles on most of the spectrum when it was created, focused entirely on the Earth. My personal favorite, the exceedingly well written book on remote sensing by Floyd Sabins first published in 1978, covered the visual, infrared, and microwave portions of the spectrum beautifully but focused on the Earth as well. Unhindered, I developed what I called ‘packets’ of material for each part of the spectrum.

Remote Sensing for GIS Managers Stanley Aronoff 2005 How to use remote sensing technology as geographic data is demonstrated, as is how remote sensing products are the perfect complement to GIS-based analysis in industries such as emergency response, meteorology, water resources, land use and urban planning.

The SAGE Handbook of Remote Sensing Timothy A Warner 2009-06-18 'A magnificent achievement. A who's who of contemporary remote sensing have produced an engaging, wide-ranging and scholarly review of the field in just one volume' - Professor Paul Curran, Vice-Chancellor, Bournemouth University Remote Sensing acquires and interprets small or large-scale data about the Earth from a distance. Using a wide range of spatial, spectral, temporal, and radiometric scales Remote Sensing is a large and diverse field for which this Handbook will be the key research reference. Organized in four key sections: • Interactions of Electromagnetic Radiation with the Terrestrial Environment: chapters on Visible, Near-IR and Shortwave IR; Middle IR (3-5 micrometers); Thermal IR ; Microwave • Digital sensors and Image Characteristics: chapters on Sensor Technology; Coarse Spatial Resolution Optical Sensors ; Medium Spatial Resolution Optical Sensors; Fine Spatial Resolution Optical Sensors; Video Imaging and Multispectral Digital Photography; Hyperspectral Sensors; Radar and Passive Microwave Sensors; Lidar • Remote Sensing Analysis - Design and Implementation: chapters on Image Pre-Processing; Ground Data Collection; Integration with GIS; Quantitative Models in Remote Sensing; Validation and accuracy assessment; • Remote Sensing Analysis - Applications: LITHOSPHERIC SCIENCES: chapters on Topography; Geology; Soils; PLANT SCIENCES: Vegetation; Agriculture; HYDROSPHERIC and CRYSOPHERIC SCIENCES: Hydrosphere: Fresh and Ocean Water; Cryosphere; GLOBAL CHANGE AND HUMAN ENVIRONMENTS: Earth Systems; Human Environments & Links to the Social Sciences; Real Time Monitoring Systems and Disaster Management; Land Cover Change Illustrated throughout, an essential resource for the analysis of remotely sensed data, the SAGE Handbook of Remote Sensing provides researchers with a definitive statement of the core concepts and methodologies in the discipline.

Despeckling Methods for Medical Ultrasound Images Ju Zhang 2019-10-16 Based upon the research they have conducted over the past decade in the field of denoising processes for medical ultrasonic imaging, in this book, the authors systematically present despeckling methods for medical ultrasonic images. Firstly, the respective methods are reviewed and divided into five categories. Secondly, after introducing some basic mathematical tools such as wavelet and shearlet transforms, the authors highlight five recently developed despeckling methods for medical ultrasonic images. In turn, simulations and experiments for clinical ultrasonic images are presented for each method, and comparison studies with other well-known existing methods are conducted, showing the effectiveness and superiority of the new methods. Students and researchers in the field of signal and image processing, as well as medical professionals whose work involves ultrasonic diagnosis, will greatly benefit from this book. Familiarizing them with the state of the art in despeckling methods for medical ultrasonic images, it offers a useful reference guide for their study and research work.

Image Processing Algorithms and Techniques II Sanjit Kumar Mitra 1991

Basic Cartography Volume 3 R W Anson 1993 Vol. 3 published on behalf of ICA by Butterworth/Heinemann.

General Technical Report RMRS 1998

Manual of Geospatial Science and Technology John D. Bossler 2001-11-22 Professionals in local and national government and in the private sector frequently need to draw on Geographical Information Systems (GIS), Remote Sensing (RS) and Global Positioning Systems (GPS), often in an integrated manner. This manual shows a hands-on operator how to work across the range of geospatial science and technology, whether as a user or as a contractor of services employing these technologies, and without either specialist education or substantial experience. The manual covers the fundamentals of each of these topical areas, providing the requisite mathematics, computer science and physics necessary to understand how the technologies work, assuming some elementary background in calculus and physics. It also shows how the technologies can be used together and focuses on their commonalities. A number of applications such as mapping and environmental modeling are presented, and a website accompanies the book.

Industrial Applications of Lasers John Ready 2012-12-02 Industrial Applications of Lasers focuses on how lasers have been used for practical applications in industry. This text aims to stimulate the imagination of the readers, who can then evaluate the potential application of lasers to solve their own problems.

Comprised of 21 chapters, this book starts with an overview of the fundamental background of lasers, and then discusses the basic principles of how lasers operate. Other chapters provide an understanding of how holograms really work. This text also discusses several topics relevant to lasers, themselves, including the types of practical lasers and laser properties. This book considers laser safety, which is very important for anyone considering a laser application. Finally, this text explores the various developed laser applications, including scribing of ceramics, laser welding and cutting of metals, as well as applications in surveying, alignment, and metrology. This book is a valuable resource to laser technicians, physicists, scientists, researchers, and readers whose interests span a variety of fields.

5th Annual International Conference, Map India 2002 2002 Contributed articles presented at a conference organized by Centre for Spatial Database Management & Solutions (Noida, India).

Hyperspectral Image Processing Liguo Wang 2015-07-15 Based on the authors' research, this book introduces the main processing techniques in hyperspectral imaging. In this context, SVM-based classification, distance comparison-based endmember extraction, SVM-based spectral unmixing, spatial attraction model-based sub-pixel mapping and MAP/POCS-based super-resolution reconstruction are discussed in depth. Readers will gain a comprehensive understanding of these cutting-edge hyperspectral imaging techniques. Researchers and graduate students in fields such as remote sensing, surveying and mapping, geosciences and information systems will benefit from this valuable resource.

Proceedings of International Conference on VLSI, Communication, Advanced Devices, Signals & Systems and Networking (VCASAN-2013) Veena S. Chakravarthi 2013-07-10 This book is a collection of papers presented by renowned researchers, keynote speakers, and academicians in the International Conference on VLSI, Communication, Analog Designs, Signals & Systems and Networking (VCASAN-2013), organized by B.N.M. Institute of Technology, Bangalore, India during July 17-19, 2013. The book provides global trends in cutting-edge technologies in electronics and communication engineering. The content of the book is useful to engineers, researchers, and academicians as well as industry professionals.

Advanced Image Processing Techniques for Remotely Sensed Hyperspectral Data Pramod K. Varshney 2004-08-12 The main objective of this book is to apprise the reader of the use of a number of tools and techniques for a variety of image processing tasks, namely Independent Component Analysis (ICA), Mutual Information (MI), Markov Random Field (MRF) Models and Support Vector Machines (SVM). Typical applications considered are feature extraction, image classification, image fusion and change detection. The book also treats a number of experimental examples based on a variety of remote sensors.The utility of the book will be highly appreciated by academicians and R & D professionals, who are involved in current research in the area of hyperspectral imaging, as well as by professional remote-sensing data users such as geologists, hydrologists, environmental scientists, civil engineers and computer scientists.

Intelligent Robots and Computer Vision 1990

Small-Format Aerial Photography James S. Aber 2010-05-28 As the need for geographical data rapidly expands in the 21st century, so too do applications of small-format aerial photography for a wide range of scientific, commercial and governmental purposes. Small-format Aerial Photography (SFAP) presents basic and advanced principles and techniques with an emphasis on digital cameras. Unmanned platforms are described in considerable detail, including kites, helium and hot-air blimps, model airplanes, and paragliders. Several case studies, primarily drawn from the geosciences, are presented to demonstrate how SFAP is actually used in various applications. Many of these integrate SFAP with ground-based investigations as well as conventional large-format aerial photography, satellite imagery, and other kinds of geographic information. Full-color photographs throughout Case studies from around the globe Techniques presented allow for image resolution impossible to match via traditional aerial photography or satellite datasets Glossary clarifies key terms

Intelligent Interactive Multimedia Systems and Services 2017 Giuseppe De Pietro 2017-05-26 This book constitutes the refereed proceedings of the Tenth International KES Conference on Intelligent Interactive Multimedia Systems and Services: IIMSS-17. It includes 57 full papers organized into topical sections, ranging from visual data processing to big data analytics, and from multimedia to intelligent and cognitive systems. The conference took place as part of the Smart Digital Futures 2017 multi-theme conference, held in Vilamoura, Algarve, Portugal on 21-23 June 2017, which brings together AMSTA, IDT, InHorizons, InMed, SEEL and IIMSS in one venue. It provided an international forum for researchers and scientists to share their work and experiences in the field of multimedia and intelligent interactive systems and services.