

Deep Learning For Remote Sensing Data Wuhan University

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Applications of Remote Sensing Data in Mapping of Forest Growing Stock and Biomass - José Aranha 2021-09-01

This Special Issue (SI), entitled "Applications of Remote Sensing Data in Mapping of Forest Growing Stock and Biomass", resulted from 13 peer-reviewed papers dedicated to Forestry and Biomass mapping, characterization and accounting. The papers' authors presented improvements in Remote Sensing processing techniques on satellite images, drone-acquired images and LiDAR images, both aerial and terrestrial. Regarding the images' classification models, all authors presented supervised methods, such as Random Forest, complemented by GIS routines and biophysical variables measured on the field, which were properly georeferenced. The achieved results enable the statement that remote imagery could be successfully used as a data source for regression analysis and formulation and, in this way, used in forestry actions such as canopy structure analysis and mapping, or to estimate biomass. This collection of papers, presented in the form of a book, brings together 13 articles covering various forest issues and issues in forest biomass calculation, constituting an important work manual for those who use mixed GIS and RS techniques.

Cloud Computing in Ocean and Atmospheric Sciences - Tiffany C Vance 2016-07-16

Cloud Computing in Ocean and Atmospheric Sciences provides the latest information on this relatively new platform for scientific computing, which has great possibilities and challenges, including pricing and deployments costs and applications that are often presented as primarily business oriented. In addition, scientific users may be very familiar with these types of models and applications, but relatively unfamiliar with the intricacies of the hardware platforms they use. The book provides a range of practical examples of cloud applications that are written to be accessible to practitioners, researchers, and students in affiliated fields. By providing general information on the use of the cloud for oceanographic and atmospheric computing, as well as examples of specific applications, this book encourages and educates potential users of the cloud. The chapters provide an introduction to the practical aspects of deploying in the cloud, also providing examples of workflows and techniques that can be reused in new projects. Provides real examples that help new users quickly understand the cloud and provide guidance for new projects Presents proof of the usability of the techniques and a clear path to adoption of the techniques by other researchers Includes real research and development examples that are ideal for cloud computing adopters in ocean and atmospheric domains

Research Anthology on Artificial Neural Network Applications - Management Association, Information Resources 2021-07-16

Artificial neural networks (ANNs) present many benefits in analyzing complex data in a proficient manner. As an effective and efficient problem-solving method, ANNs are incredibly useful in many different fields. From education to medicine and banking to engineering, artificial neural networks are a growing phenomenon as more realize the plethora of uses and benefits they provide. Due to their complexity, it is vital for researchers to understand ANN capabilities in various fields. The Research Anthology on Artificial Neural Network Applications covers critical topics related to artificial neural networks and their multitude of applications in a number of diverse areas including medicine, finance, operations research, business, social media, security, and more. Covering everything from the applications and uses of artificial neural networks to deep learning and non-linear problems, this book is ideal for computer scientists, IT specialists, data scientists, technologists, business owners, engineers, government agencies, researchers, academicians, and students, as well as anyone who is interested in learning more about how artificial neural networks can be used across a wide range of fields.

Image and Graphics - Yuxin Peng 2021-09-30

This three-volume set LNCS 12888, 12898, and 12890 constitutes the refereed conference proceedings of the 11th International Conference on Image and Graphics, ICIG 2021, held in Haikou, China, in August 2021.* The 198 full papers presented were selected from 421 submissions and focus on advances of theory, techniques and algorithms as well as innovative technologies of image, video and graphics processing and fostering innovation, entrepreneurship, and networking. *The conference was postponed due to the COVID-19 pandemic.

Urban High-Resolution Remote Sensing - Guoqing Zhou 2020-12-22
With urbanization as a global phenomenon, there is a need for data and information about these terrains. Urban remote sensing techniques provide critical physical input and intelligence for preparing base maps, formulating planning proposals, and monitoring implementations. Likewise these methodologies help with understanding the biophysical properties, patterns, and process of urban landscapes, as well as mapping and monitoring urban land cover and spatial extent. Advanced sensor technologies and image processing methodologies such as deep learning, data mining, etc., facilitate the wide applications of remote sensing technology in urban areas. This book presents advanced image processing methods and algorithms focused on three very important roots of urban remote sensing: 3D urban modelling using different remotely sensed data, urban orthophotomap generation, and urban feature extraction, which are also today's real challenges in high resolution remote sensing. Data generated by remote sensing, with its repetitive and synoptic viewing and multispectral capabilities, constitutes a powerful tool for mapping and monitoring emerging changes in the city's urban core, as well as in peripheral areas. Features: Provides advances in emerging methods and algorithms in image processing and technology Uses algorithms and methodologies for handling high-resolution imagery from a ground sampling distance (GSD) less than 1.0 meter Focuses on 3D urban modelling, orthorectification methodologies, and urban feature extraction algorithms from high-resolution remotely sensed imagery Demonstrates how to apply up-to-date techniques to the problems identified and how to analyze research results Presents methods and algorithms for monitoring, analyzing, and modeling urban growth, urban planning, and socio-economic developments In this book, readers are provided with valuable research studies and applications-oriented chapters in areas such as urban trees, soil moisture mapping, city transportation, urban remote sensing big data, etc.

Innovative Applications of Big Data in the Railway Industry - Kohli, Shruti 2017-11-30

Use of big data has proven to be beneficial within many different industries, especially in the field of engineering; however, infiltration of this type of technology into more traditional heavy industries, such as the railways, has been limited. Innovative Applications of Big Data in the Railway Industry is a pivotal reference source for the latest research findings on the utilization of data sets in the railway industry. Featuring extensive coverage on relevant areas such as driver support systems, railway safety management, and obstacle detection, this publication is an ideal resource for transportation planners, engineers, policymakers, and graduate-level engineering students seeking current research on a specific application of big data and its effects on transportation.

Deep Learning for the Earth Sciences - Gustau Camps-Valls 2021-08-18

DEEP LEARNING FOR THE EARTH SCIENCES Explore this insightful treatment of deep learning in the field of earth sciences, from four leading voices Deep learning is a fundamental technique in modern Artificial Intelligence and is being applied to disciplines across the scientific spectrum; earth science is no exception. Yet, the link between deep learning and Earth sciences has only recently entered academic curricula and thus has not yet proliferated. Deep Learning for the Earth Sciences delivers a unique perspective and treatment of the concepts,

skills, and practices necessary to quickly become familiar with the application of deep learning techniques to the Earth sciences. The book prepares readers to be ready to use the technologies and principles described in their own research. The distinguished editors have also included resources that explain and provide new ideas and recommendations for new research especially useful to those involved in advanced research education or those seeking PhD thesis orientations. Readers will also benefit from the inclusion of: An introduction to deep learning for classification purposes, including advances in image segmentation and encoding priors, anomaly detection and target detection, and domain adaptation An exploration of learning representations and unsupervised deep learning, including deep learning image fusion, image retrieval, and matching and co-registration Practical discussions of regression, fitting, parameter retrieval, forecasting and interpolation An examination of physics-aware deep learning models, including emulation of complex codes and model parametrizations Perfect for PhD students and researchers in the fields of geosciences, image processing, remote sensing, electrical engineering and computer science, and machine learning, *Deep Learning for the Earth Sciences* will also earn a place in the libraries of machine learning and pattern recognition researchers, engineers, and scientists.

Advances in Artificial Intelligence, Software and Systems Engineering - Tareq Ahram 2020-07-03

This book addresses emerging issues concerning the integration of artificial intelligence systems in our daily lives. It focuses on the cognitive, visual, social and analytical aspects of computing and intelligent technologies, and highlights ways to improve the acceptance, effectiveness, and efficiency of said technologies. Topics such as responsibility, integration and training are discussed throughout. The book also reports on the latest advances in systems engineering, with a focus on societal challenges and next-generation systems and applications for meeting them. Based on the AHFE 2020 Virtual Conference on Software and Systems Engineering, and the AHFE 2020 Virtual Conference on Artificial Intelligence and Social Computing, held on July 16–20, 2020, it provides readers with extensive information on current research and future challenges in these fields, together with practical insights into the development of innovative services for various purposes.

Brain Informatics and Health - Yike Guo 2015-08-20

This book constitutes the proceedings of the International Conference on Brain Informatics and Health, BIH 2015, held in London, UK, in August/September 2015. The 42 full papers presented were carefully reviewed and selected from 82 submissions. Following the success of past conferences in this series, BIH 2015 has a strong emphasis on emerging trends of big data analysis and management technology for brain research, behavior learning, and real-world applications of brain science in human health and wellbeing.

Application of Big Data, Deep Learning, Machine Learning, and Other Advanced Analytical Techniques in Environmental Economics and Policy - Tsun Se Cheong 2022-07-25

Advances in Multimedia Information Processing - PCM 2018 - Richang Hong 2018-09-17

The three-volume set LNCS 101164, 11165, and 11166 constitutes the refereed proceedings of the 19th Pacific-Rim Conference on Multimedia, PCM 2018, held in Hefei, China, in September 2018. The 209 regular papers presented together with 20 special session papers were carefully reviewed and selected from 452 submissions. The papers cover topics such as: multimedia content analysis; multimedia signal processing and communications; and multimedia applications and services.

Spatial Data Mining - Deren Li 2016-03-23

This book is an updated version of a well-received book previously published in Chinese by Science Press of China (the first edition in 2006 and the second in 2013). It offers a systematic and practical overview of spatial data mining, which combines computer science and geo-spatial information science, allowing each field to profit from the knowledge and techniques of the other. To address the spatiotemporal specialties of spatial data, the authors introduce the key concepts and algorithms of the data field, cloud model, mining view, and Deren Li methods. The data field method captures the interactions between spatial objects by diffusing the data contribution from a universe of samples to a universe of population, thereby bridging the gap between the data model and the recognition model. The cloud model is a qualitative method that utilizes quantitative numerical characters to bridge the gap between pure data and linguistic concepts. The mining view method discriminates the

different requirements by using scale, hierarchy, and granularity in order to uncover the anisotropy of spatial data mining. The Deren Li method performs data preprocessing to prepare it for further knowledge discovery by selecting a weight for iteration in order to clean the observed spatial data as much as possible. In addition to the essential algorithms and techniques, the book provides application examples of spatial data mining in geographic information science and remote sensing. The practical projects include spatiotemporal video data mining for protecting public security, serial image mining on nighttime lights for assessing the severity of the Syrian Crisis, and the applications in the government project 'the Belt and Road Initiatives'.

Advanced Technologies, Systems, and Applications V - Samir Avdaković 2020-11-04

This book gathers papers that are centered on the theory and practice of a wide variety of advanced technologies. They cover the latest developments in computing, networking, information technology, robotics, complex systems, communications, energy, mechanical engineering, civil engineering, geodesy, and other subjects. These papers were selected for presentation at the 12th annual conference Days of the Bosnian-Herzegovinian American Academy of Arts and Sciences (BHAAAS), which was scheduled to be held in Mostar, Bosnia and Herzegovina in June 2020 but was postponed due to the coronavirus pandemic. However, in light of the high quality of the submissions, BHAAAS' technical and natural sciences division decided to create this special book despite the postponement. The editors would like to extend their special thanks to all the chairs of the planned symposia for their dedicated work in the production of this book: Jasmin Kevrić, Zerina Mašetić, Dželila Mehanović (Computer Science); Anes Kazagić, Hajrudin Džafo, Izet Smajević (Mechanical Engineering); Tarik Uzunović, Asif Šabanović, Jasmin Kevrić (Mechatronics, Robotics and Embedded Systems); Mirza Šarić, Tarik Hubana, Maja Muftić Dedović (Advanced Electrical Power Systems); Mirza Pozder, Naida Ademović, Medžida Mulić (Civil Engineering and Geodesy); Adnan Mujezinović, Muris Torlak (Computer Modeling and Simulations for Engineering Applications); and Aljo Mujčić, Edin Mujčić (Information and Communication Technologies).

Subpixel Mapping for Remote Sensing Images - Peng Wang 2022-12-15

Subpixel mapping is a technology that generates a fine resolution land cover map from coarse resolution fractional images by predicting the spatial locations of different land cover classes at the subpixel scale. This book provides readers with a complete overview of subpixel image processing methods, basic principles, and different subpixel mapping techniques based on single or multi-shift remote sensing images. Step-by-step procedures, experimental contents, and result analyses are explained clearly at the end of each chapter. Real-life applications are a great resource for understanding how and where to use subpixel mapping when dealing with different remote sensing imaging data. This book will be of interest to undergraduate and graduate students, majoring in remote sensing, surveying, mapping, and signal and information processing in universities and colleges, and it can also be used by professionals and researchers at different levels in related fields.

Cartography from Pole to Pole - Manfred Buchroithner 2013-08-16

This volume comprehends a selection of papers presented during the 26th International Cartographic Conference held in Dresden from the 26th to the 30th of August 2013. It covers many fields of relevant Mapping and GIS research subjects, such as cartographic applications, cartographic tools, generalisation and update Propagation, higher dimensional visualisation and augmented reality, planetary mapping issues, cartography and environmental modelling, user generated content and spatial data infrastructure, use and usability as well as cartography and GIS in education.

Machine Learning Paradigms - George A. Tsihrintzis 2019-07-06

This book is the inaugural volume in the new Springer series on Learning and Analytics in Intelligent Systems. The series aims at providing, in hard-copy and soft-copy form, books on all aspects of learning, analytics, advanced intelligent systems and related technologies. These disciplines are strongly related and mutually complementary; accordingly, the new series encourages an integrated approach to themes and topics in these disciplines, which will result in significant cross-fertilization, research advances and new knowledge creation. To maximize the dissemination of research findings, the series will publish edited books, monographs, handbooks, textbooks and conference proceedings. This book is intended for professors, researchers, scientists, engineers and students. An extensive list of references at the end of each chapter allows readers to probe further into those application areas that interest them most.

Web Technologies and Applications - Reynold Cheng 2015-09-24

This book constitutes the refereed proceedings of the 17th Asia-Pacific Conference APWeb 2015 held in Guangzhou, China, in September 2015. The 67 full papers and presented together with 3 industrial track papers and 7 demonstration track papers were carefully reviewed and selected from 146 submissions. The papers cover a wide spectrum of Web-related data management problems, and provide a thorough view on the rapid advances of technical solutions.

Manual of Digital Earth - Huadong Guo 2019-11-18

This open access book offers a summary of the development of Digital Earth over the past twenty years. By reviewing the initial vision of Digital Earth, the evolution of that vision, the relevant key technologies, and the role of Digital Earth in helping people respond to global challenges, this publication reveals how and why Digital Earth is becoming vital for acquiring, processing, analysing and mining the rapidly growing volume of global data sets about the Earth. The main aspects of Digital Earth covered here include: Digital Earth platforms, remote sensing and navigation satellites, processing and visualizing geospatial information, geospatial information infrastructures, big data and cloud computing, transformation and zooming, artificial intelligence, Internet of Things, and social media. Moreover, the book covers in detail the multi-layered/multi-faceted roles of Digital Earth in response to sustainable development goals, climate changes, and mitigating disasters, the applications of Digital Earth (such as digital city and digital heritage), the citizen science in support of Digital Earth, the economic value of Digital Earth, and so on. This book also reviews the regional and national development of Digital Earth around the world, and discusses the role and effect of education and ethics. Lastly, it concludes with a summary of the challenges and forecasts the future trends of Digital Earth. By sharing case studies and a broad range of general and scientific insights into the science and technology of Digital Earth, this book offers an essential introduction for an ever-growing international audience.

Multisensor Data Fusion and Machine Learning for Environmental Remote Sensing - Ni-Bin Chang 2018-02-21

In the last few years the scientific community has realized that obtaining a better understanding of interactions between natural systems and the man-made environment across different scales demands more research efforts in remote sensing. An integrated Earth system observatory that merges surface-based, air-borne, space-borne, and even underground sensors with comprehensive and predictive capabilities indicates promise for revolutionizing the study of global water, energy, and carbon cycles as well as land use and land cover changes. The aim of this book is to present a suite of relevant concepts, tools, and methods of integrated multisensor data fusion and machine learning technologies to promote environmental sustainability. The process of machine learning for intelligent feature extraction consists of regular, deep, and fast learning algorithms. The niche for integrating data fusion and machine learning for remote sensing rests upon the creation of a new scientific architecture in remote sensing science that is designed to support numerical as well as symbolic feature extraction managed by several cognitively oriented machine learning tasks at finer scales. By grouping a suite of satellites with similar nature in platform design, data merging may come to help for cloudy pixel reconstruction over the space domain or concatenation of time series images over the time domain, or even both simultaneously. Organized in 5 parts, from Fundamental Principles of Remote Sensing; Feature Extraction for Remote Sensing; Image and Data Fusion for Remote Sensing; Integrated Data Merging, Data Reconstruction, Data Fusion, and Machine Learning; to Remote Sensing for Environmental Decision Analysis, the book will be a useful reference for graduate students, academic scholars, and working professionals who are involved in the study of Earth systems and the environment for a sustainable future. The new knowledge in this book can be applied successfully in many areas of environmental science and engineering.

Big Data Computing for Geospatial Applications - Zhenlong Li 2020-11-23

The convergence of big data and geospatial computing has brought forth challenges and opportunities to Geographic Information Science with regard to geospatial data management, processing, analysis, modeling, and visualization. This book highlights recent advancements in integrating new computing approaches, spatial methods, and data management strategies to tackle geospatial big data challenges and meanwhile demonstrates opportunities for using big data for geospatial applications. Crucial to the advancements highlighted in this book is the integration of computational thinking and spatial thinking and the transformation of abstract ideas and models to concrete data structures

and algorithms.

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Issues in Artificial Intelligence, Robotics and Machine Learning: 2013 Edition - 2013-05-01

Issues in Artificial Intelligence, Robotics and Machine Learning: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Expert Systems. The editors have built Issues in Artificial Intelligence, Robotics and Machine Learning: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Expert Systems in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Artificial Intelligence, Robotics and Machine Learning: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

IoT and Spacecraft Informatics - K.L. Yung 2022-04-01

IoT and Spacecraft Informatics provides the theory and applications of IoT systems in the design, development and operation of spacecraft. Sections present a high-level overview of IoT and introduce key concepts needed to successfully design IoT solutions, key technologies, protocols, and technical building blocks that combine into complete IoT solutions. The book features the latest advances, findings and state-of-the-art in research, case studies, development and implementation of IoT technologies for spacecraft and space systems. In addition, it concentrates on different aspects and techniques to achieve automatic control of spacecraft. This book is for researchers, PhD students, engineers and specialists in aerospace engineering as well as those in computer science, computer engineering or mechatronics. Presents state-of-the-art research on IoT and spacecraft technology Provides artificial intelligence-based solutions and robotics for space exploration applications Introduces new applications and case studies of IoT and spacecraft informatics

Building Feature Extraction with Machine Learning - Bharath.H. Aithal 2022-12-29

Big geospatial datasets created by large infrastructure projects require massive computing resources to process. Feature extraction is a process used to reduce the initial set of raw data for manageable image processing, and machine learning (ML) is the science that supports it. This book focuses on feature extraction methods for optical geospatial data using ML. It is a practical guide for professionals and graduate students who are starting a career in information extraction. It explains spatial feature extraction in an easy-to-understand way and includes real case studies on how to collect height values for spatial features, how to develop 3D models in a map context, and others. Features • Provides the basics of feature extraction methods and applications along with the fundamentals of machine learning • Discusses in detail the application of machine learning techniques in geospatial building feature extraction • Explains the methods for estimating object height from optical satellite remote sensing images using Python • Includes case studies that demonstrate the use of machine learning models for building footprint extraction and photogrammetric methods for height assessment • Highlights the potential of machine learning and geospatial technology for future project developments This book will be of interest to professionals, researchers, and graduate students in geoscience and earth observation, machine learning and data science, civil engineers, and urban planners.

Advances in Neural Networks - ISSN 2006 - Jun Wang 2006-05-11

This is Volume III of a three volume set constituting the refereed proceedings of the Third International Symposium on Neural Networks, ISSN 2006. 616 revised papers are organized in topical sections on neurobiological analysis, theoretical analysis, neurodynamic optimization, learning algorithms, model design, kernel methods, data preprocessing, pattern classification, computer vision, image and signal processing, system modeling, robotic systems, transportation systems, communication networks, information security, fault detection, financial analysis, bioinformatics, biomedical and industrial applications, and more.

Climate Impacts on Sustainable Natural Resource Management - Pavan Kumar 2021-12-01

CLIMATE IMPACTS ON SUSTAINABLE NATURAL RESOURCE

MANAGEMENT Climate change has emerged as one of the predominant global concerns of the 21st century. Statistics show that the average surface temperature of the Earth has increased by about 1.18°C since the late 19th century and the sea levels are rising due to the melting of glaciers. Further rise in the global temperature will have dire consequences for the survival of humans on the planet Earth. There is a need to monitor climatic data and associated drivers of changes to develop sustainable planning. The anthropogenic activities that are linked to climate change need scientific evaluation and must be curtailed before it is too late. This book contributes significantly in the field of sustainable natural resource management linked to climate change. Up to date research findings from developing and developed countries like India, Indonesia, Japan, Malaysia, Sri Lanka and the USA have been presented through selected case studies covering different thematic areas. The book has been organised into six major themes of sustainable natural resource management, determinants of forest productivity, agriculture and climate change, water resource management and riverine health, climate change threat on natural resources, and linkages between natural resources and biotic-abiotic stressors to develop the concept and to present the findings in a way that is useful for a wide range of readers. While the range of applications and innovative techniques is constantly increasing, this book provides a summary of findings to provide the updated information. This book will be of interest to researchers and practitioners in the field of environmental sciences, remote sensing, geographical information system, meteorology, sociology and policy studies related to natural resource management and climate change.

Urban Remote Sensing - Xiaojun X. Yang 2021-10-06

The second edition of *Urban Remote Sensing* is a state-of-the-art review of the latest progress in the subject. The text examines how evolving innovations in remote sensing allow to deliver the critical information on cities in a timely and cost-effective way to support various urban management activities and the scientific research on urban morphology, socio-environmental dynamics, and sustainability. Chapters are written by leading scholars from a variety of disciplines including remote sensing, GIS, geography, urban planning, environmental science, and sustainability science, with case studies predominately drawn from North America and Europe. A review of the essential and emerging research areas in urban remote sensing including sensors, techniques, and applications, especially some critical issues that are shifting the directions in urban remote sensing research. Illustrated in full color throughout, including numerous relevant case studies and extensive discussions of important concepts and cutting-edge technologies to enable clearer understanding for non-technical audiences. *Urban Remote Sensing, Second Edition* will be of particular interest to upper-division undergraduate and graduate students, researchers and professionals working in the fields of remote sensing, geospatial information, and urban & environmental planning.

Advances in Computation and Intelligence - Zhenhua Li 2009-09-30

Volumes CCIS 51 and LNCS 5812 constitute the proceedings of the Fourth International Symposium on Intelligence Computation and Applications, ISICA 2009, held in Huangshi, China, during October 23-25. ISICA 2009 attracted over 300 submissions. Through rigorous reviews, 58 papers were included in LNCS 5821, and 54 papers were collected in CCIS 51. ISICA conferences are one of the first series of international conferences on computational intelligence that combine elements of learning, adaptation, evolution and fuzzy logic to create programs as alternative solutions to artificial intelligence.

Computer and Computing Technologies in Agriculture IV -

Daoliang Li 2011-02-11

This book constitutes Part I of the refereed four-volume post-conference proceedings of the 4th IFIP TC 12 International Conference on Computer and Computing Technologies in Agriculture, CCTA 2010, held in Nanchang, China, in October 2010. The 352 revised papers presented were carefully selected from numerous submissions. They cover a wide range of interesting theories and applications of information technology in agriculture, including simulation models and decision-support systems for agricultural production, agricultural product quality testing, traceability and e-commerce technology, the application of information and communication technology in agriculture, and universal information service technology and service systems development in rural areas.

Remote Sensing of Night-time Light - Christopher Elvidge 2021-08-10

Satellite images acquired at night provide a visually arresting perspective of the Earth and the human activities that light up the

otherwise mostly dark Earth. These night-time light satellite images can be compiled into a geospatial time series that represent an invaluable source of information for both the natural and social sciences. Night-time light remote sensing has been shown to be particularly useful for a range of natural science and social science applications, including studies relating to urban development, demography, sociology, fishing activity, light pollution and the consequences of civil war. Key sensors for these time-series include the Defense Meteorological Satellite Program's Operational Linescan System (DMSP/OLS) and the Suomi National Polar-orbiting Partnership Satellite's Visible Infrared Imaging Radiometer Suite Day/Night Band (Suomi NPP/VIIRS DNB). An increasing number of alternative sources are also available, including high spatial resolution and multispectral sensors. This book captures key methodological issues associated with pre-processing night-time light data, documents state of the art analysis methods, and explores a wide range of applications. Major sections focus on NPP/VIIRS DNB processing; inter-calibration between NPP/VIIRS and DMSP/OLS; applications associated with socio-economic activities, applications in monitoring urbanization; and fishing activity monitoring. The chapters in this book were originally published as a special issue of the *International Journal of Remote Sensing*.

Google Earth Engine Applications - Lalit Kumar 2019-04-23

In a rapidly changing world, there is an ever-increasing need to monitor the Earth's resources and manage it sustainably for future generations. Earth observation from satellites is critical to provide information required for informed and timely decision making in this regard.

Satellite-based earth observation has advanced rapidly over the last 50 years, and there is a plethora of satellite sensors imaging the Earth at finer spatial and spectral resolutions as well as high temporal resolutions. The amount of data available for any single location on the Earth is now at the petabyte-scale. An ever-increasing capacity and computing power is needed to handle such large datasets. The Google Earth Engine (GEE) is a cloud-based computing platform that was established by Google to support such data processing. This facility allows for the storage, processing and analysis of spatial data using centralized high-power computing resources, allowing scientists, researchers, hobbyists and anyone else interested in such fields to mine this data and understand the changes occurring on the Earth's surface. This book presents research that applies the Google Earth Engine in mining, storing, retrieving and processing spatial data for a variety of applications that include vegetation monitoring, cropland mapping, ecosystem assessment, and gross primary productivity, among others. Datasets used range from coarse spatial resolution data, such as MODIS, to medium resolution datasets (Worldview -2), and the studies cover the entire globe at varying spatial and temporal scales.

Generalization With Deep Learning: For Improvement On Sensing Capability - Zhenghua Chen 2021-04-07

Deep Learning has achieved great success in many challenging research areas, such as image recognition and natural language processing. The key merit of deep learning is to automatically learn good feature representation from massive data conceptually. In this book, we will show that the deep learning technology can be a very good candidate for improving sensing capabilities. In this edited volume, we aim to narrow the gap between humans and machines by showcasing various deep learning applications in the area of sensing. The book will cover the fundamentals of deep learning techniques and their applications in real-world problems including activity sensing, remote sensing and medical sensing. It will demonstrate how different deep learning techniques help to improve the sensing capabilities and enable scientists and practitioners to make insightful observations and generate invaluable discoveries from different types of data.

Proceedings of the International Conference on Paradigms of Communication, Computing and Data Sciences - Mohit Dua 2022-01-01

This book gathers selected high-quality research papers presented at the International Conference on Paradigms of Communication, Computing and Data Sciences (PCCDS 2021), held at the National Institute of Technology, Kurukshetra, India, during May 07-09, 2021. It discusses high-quality and cutting-edge research in the areas of advanced computing, communications, and data science techniques. The book is a collection of latest research articles in computation algorithm, communication, and data sciences, intertwined with each other for efficiency.

Applications of Artificial Neural Networks for Nonlinear Data - Patel, Hiral Ashil 2020-09-25

Processing information and analyzing data efficiently and effectively is

crucial for any company that wishes to stay competitive in its respective market. Nonlinear data presents new challenges to organizations, however, due to its complexity and unpredictability. The only technology that can properly handle this form of data is artificial neural networks. These modeling systems present a high level of benefits in analyzing complex data in a proficient manner, yet considerable research on the specific applications of these intelligent components is significantly deficient. Applications of Artificial Neural Networks for Nonlinear Data is a collection of innovative research on the contemporary nature of artificial neural networks and their specific implementations within data analysis. While highlighting topics including propagation functions, optimization techniques, and learning methodologies, this book is ideally designed for researchers, statisticians, academicians, developers, scientists, practitioners, students, and educators seeking current research on the use of artificial neural networks in diagnosing and solving nonparametric problems.

Machine Learning Techniques Applied to Geoscience Information System and Remote Sensing - Hyung-Sup Jung 2019-09-03

As computer and space technologies have been developed, geoscience information systems (GIS) and remote sensing (RS) technologies, which deal with the geospatial information, have been rapidly maturing. Moreover, over the last few decades, machine learning techniques including artificial neural network (ANN), deep learning, decision tree, and support vector machine (SVM) have been successfully applied to geospatial science and engineering research fields. The machine learning techniques have been widely applied to GIS and RS research fields and have recently produced valuable results in the areas of geoscience, environment, natural hazards, and natural resources. This book is a collection representing novel contributions detailing machine learning techniques as applied to geoscience information systems and remote sensing.

Machine Learning and Intelligent Communications - Xiaolin Jiang 2022-05-17

This volume constitutes the refereed post-conference proceedings of the 6th International Conference on Machine Learning and Intelligent Communications, MLICOM 2021, held in November 2021. Due to COVID-19 pandemic the conference was held virtually. The 28 revised full papers were carefully selected from 58 submissions. The papers are organized thematically in tracks as follows: internet of vehicle communication system; applications of neural network and deep learning; intelligent massive MIMO communications; intelligent positioning and navigation systems; intelligent space and terrestrial integrated networks; machine learning algorithms and intelligent networks; image information processing.

Learning to Understand Remote Sensing Images - Qi Wang 2019-09-30

With the recent advances in remote sensing technologies for Earth observation, many different remote sensors are collecting data with distinctive properties. The obtained data are so large and complex that analyzing them manually becomes impractical or even impossible.

Therefore, understanding remote sensing images effectively, in connection with physics, has been the primary concern of the remote sensing research community in recent years. For this purpose, machine learning is thought to be a promising technique because it can make the system learn to improve itself. With this distinctive characteristic, the algorithms will be more adaptive, automatic, and intelligent. This book introduces some of the most challenging issues of machine learning in the field of remote sensing, and the latest advanced technologies developed for different applications. It integrates with multi-source/multi-temporal/multi-scale data, and mainly focuses on learning to understand remote sensing images. Particularly, it presents many more effective techniques based on the popular concepts of deep learning and big data to reach new heights of data understanding. Through reporting recent advances in the machine learning approaches towards analyzing and understanding remote sensing images, this book can help readers become more familiar with knowledge frontier and foster an increased interest in this field.

Advances in Neural Networks - ISSN 2014 - Zhigang Zeng 2014-11-28
The volume LNCS 8866 constitutes the refereed proceedings of the 11th International Symposium on Neural Networks, ISSN 2014, held in Hong Kong and Macao, China on November/ December 2014. The 71 revised full papers presented were carefully reviewed and selected from 119 submissions. These papers cover all major topics of the theoretical research, empirical study and applications of neural networks research as follows. The focus is on following topics such as analysis, modeling, and applications.

Signal and Information Processing, Networking and Computers - Jiande Sun 2022-07-18

This book collects selected papers from the 8th Conference on Signal and Information Processing, Networking and Computers held in Ji'nan, Shandong, China on September 13-17, 2021. It focuses on the current works of information theory, communication system, computer science, aerospace technologies and big data and other related technologies. Readers from both academia and industry of this field can contribute and find their interests from the book.

Remote Sensing Based Building Extraction - Mohammad Awrangjeb 2020-03-27

Building extraction from remote sensing data plays an important role in urban planning, disaster management, navigation, updating geographic databases, and several other geospatial applications. Even though significant research has been carried out for more than two decades, the success of automatic building extraction and modeling is still largely impeded by scene complexity, incomplete cue extraction, and sensor dependency of data. Most recently, deep neural networks (DNN) have been widely applied for high classification accuracy in various areas including land-cover and land-use classification. Therefore, intelligent and innovative algorithms are needed for the success of automatic building extraction and modeling. This Special Issue focuses on newly developed methods for classification and feature extraction from remote sensing data for automatic building extraction and 3D