Road Extraction A Review Of Lidar Focused Studies

Data warehousing is an important topic that is of interest to both the industry and the knowledge engineering research communities. Both data mining and data warehousing technologies have similar objectives and can potentially benefit from each other’s methods to facilitate knowledge discovery. Improving Knowledge Discovery through the Integration of Data Mining Techniques provides insight concerning the integration of data mining and data warehousing for enhancing the knowledge discovery process. Decision makers, academicians, researchers, advanced-level students, technology developers, and business intelligence professionals will find this book useful in furthering their research exposure to relevant topics in knowledge discovery.

This dual conception of remote sensing brought us to the idea of preparing two different books; in addition to the first book which displays recent advances in remote sensing applications, this book is devoted to new techniques for data processing, sensors and platforms. We do not intend this book to cover all aspects of remote sensing techniques and platforms, since it would be an impossible task for a single volume. Instead, we have collected a number of high-quality, original and representative contributions in those areas.

This book presents most recent research studies on mapping and spatial analysis of socio-economic and environmental indicators used by various national and international contributors to regional development projects. It gathers the best contributions to the 1st International Conference on Mapping and Spatial Analysis of Socio-Economic and Environmental Indicators for the Local and Regional Sustainable Development. The conference was held in southern Tunisia, Tataouine in March 2015.

The research studies focused on generating and analyzing indicators in various domains of Agriculture, Energy, Industry, Tourism, Transport, Urban Planning, Exploitation of Natural Resources, Infrastructure, Health, Environment, Education, Information and Communication Technologies, Social Affairs and Employability, and Culture and Sport. Socio-economic and environmental indicators are important in regional development plans and strategies as they allow to observe and analyze changes in the economic growth and to measure their impact on the environment and on social networks/daily life of citizens. On the basis of well-defined geomatic approaches, and particularly, through sophisticated digital mapping and spatio-temporal analyses, authors focused on retrieving indicators to evaluate the exploitation rate of natural resources, intensity of the energy consumption in various economic sector, net migratory flows, quality checking of the air in urban areas, adaptation to climate change, and vulnerability of the coastal domain and risk of marine submersion due to sea-level rise. The book is of interest not only to investors and contributors to regional development projects, but also to all relevant policy makers.

As global communities are attempting to transform into more efficient and technologically-advanced metropolises, artificial intelligence (AI) has taken a firm grasp on various professional fields. Technology used in these industries is transforming by introducing intelligent techniques including machine learning, cognitive computing, and computer vision. This has raised significant attention among researchers and practitioners on the specific impact that these smart technologies have and what challenges remain.

Applications of Artificial Intelligence for Smart Technology is a pivotal reference source that provides vital research on the implementation of advanced technological techniques in professional industries through the use of AI. While highlighting topics such as pattern recognition, computational imaging, and machine learning, this publication explores challenges that various fields currently face when applying these technologies and examines the future uses of AI. This book is ideally designed for researchers, developers, managers, academicians, analysts, students, and practitioners seeking current research on the involvement of AI in professional practices.

Bridge Maintenance, Safety, Management, Life-Cycle Sustainability and Innovations contains lectures and papers presented at the Tenth International Conference on Bridge Maintenance, Safety and Management (IABMAS 2020), held in Sapporo, Hokkaido, Japan, April 11–15, 2021. This volume consists of a book of extended abstracts and a USB card containing the full papers of 571 contributions presented at IABMAS 2020, including the T.Y. Lin Lecture, 9 Keynote Lectures, and 561 technical papers from 40 countries.

The contributions presented at IABMAS 2020 deal with the state of the art as well as emerging concepts and innovative applications related to the main aspects of maintenance, safety, management, life-cycle sustainability and technological innovations of bridges. Major topics include: advanced bridge design, construction and maintenance approaches, safety, reliability and risk evaluation, life-cycle management, life-cycle sustainability, standardization, analytical models, bridge management systems, service life prediction, maintenance and management strategies, structural health monitoring, non-destructive testing and field testing, safety, resilience, robustness and redundancy, durability enhancement, repair and rehabilitation, fatigue and corrosion, extreme loads, and application of information and computer technology and artificial intelligence for bridges, among others.

This volume provides both an up-to-date overview of the field of bridge engineering and significant contributions to the process of making more rational decisions on maintenance, safety, management, life-cycle sustainability and technological innovations of bridges for the purpose of enhancing the welfare of society. The Editors hope that these Proceedings will serve as a valuable reference to all concerned with bridge structure and infrastructure systems, including engineers, researchers, academics and students from all areas of bridge engineering.

This book aims to promote the core understanding of a proper modelling of road traffic accidents by deep learning methods using traffic information and road geometry delineated from laser scanning data. The first two chapters of the book introduce the reader to laser scanning technology with creative explanation and graphical illustrations, review and recent methods of extracting geometric road parameters. The next three chapters present different machine learning and statistical techniques applied to extract road geometry
information from laser scanning data. Chapters 6 and 7 present methods for modelling roadside features and automatic road geometry identification in vector data. After that, this book goes on reviewing methods used for road traffic accident modelling including accident frequency and injury severity of the traffic accident (Chapter 8). Then, the next chapter explores the details of neural networks and their performance in predicting the traffic accidents along with a comparison with common data mining models. Chapter 10 presents a novel hybrid model combining extreme gradient boosting and deep neural networks for predicting injury severity of road traffic accidents. This chapter is followed by deep learning applications in modelling accident data using feed-forward, convolutional, recurrent neural network models (Chapter 11). The final chapter (Chapter 12) presents a procedure for modelling traffic accident with little data based on the concept of transfer learning. This book aims to help graduate students, professionals, decision makers, and road planners in developing better traffic accident prediction models using advanced neural networks.

Recently, growing interest in the use of remote sensing imagery has appeared to provide synoptic maps of water quality parameters in coastal and inner water ecosystems; monitoring of complex land ecosystems for biodiversity conservation; precision agriculture for the management of soils, crops, and pests; urban planning; disaster monitoring, etc. However, for these maps to achieve their full potential, it is important to engage in periodic monitoring and analysis of multi-temporal changes. In this context, very high resolution (VHR) satellite-based optical, infrared, and radar imaging instruments provide reliable information to implement spatially-based conservation actions. Moreover, they enable observations of parameters of our environment at greater broader spatial and finer temporal scales than those allowed through field observation alone. In this sense, recent very high resolution satellite technologies and image processing algorithms present the opportunity to develop quantitative techniques that have the potential to improve upon traditional techniques in terms of cost, mapping fidelity, and objectivity. Typical applications include multi-temporal classification, recognition and tracking of specific patterns, multisensor data fusion, analysis of land/marine ecosystem processes and environment monitoring, etc. This book aims to collect new developments, methodologies, and applications of very high resolution satellite data for remote sensing. The works selected provide to the research community the most recent advances on all aspects of VHR satellite remote sensing.

This work is a collection of papers from international experts, presented at the International Conference on NextGen Electronic Technologies (ICNETS-2017). ICNETS2 encompassed six symposia covering all aspects of electronics and communications engineering domains, including relevant nano/micro materials and devices. Featuring the latest research on computational signal processing and analysis, the book is useful to researchers, professionals, and students working in the core areas of electronics and their applications, especially signal processing, embedded systems, and networking.

This book comprises a collection of papers from the world's leading research groups in the field of automatic extraction of objects, especially buildings and roads, from aerial and space imagery, including new sensors like SAR and lidar.

Remote sensing of impervious surfaces has matured using advances in geospatial technology so recent that its applications have received only sporadic coverage in remote sensing literature. Remote Sensing of Impervious Surfaces is the first to focus entirely on this developing field. It provides detailed coverage of mapping, data extraction, and modeling techniques specific to analyzing impervious surfaces, such as roads and buildings. Written by renowned experts in the field, this book reviews the major approaches that apply to this emerging field as well as current challenges, developments, and trends. The authors introduce remote sensing digital image processing techniques for estimating and mapping impervious surfaces in urban and rural areas. Presenting the latest modeling tools and algorithms for data extraction and analysis, the book explains how to differentiate roads, roofs, and other manmade structures from remotely sensed images for individual analysis. The final chapters examine how to use impervious surface data for predicting the flow of storm- or floodwater and studying trends in population, land use, resource distribution, and other real-world applications in environmental, urban, and regional planning. Each chapter offers a consistent format including a concise review of basic concepts and methodologies, timely case studies, and guidance for solving problems and analyzing data using the techniques presented.

Time Frequency Signal Analysis and Processing Covers fundamental concepts, principles and techniques, treatment of specialised and advanced topics, methods and applications, including results of recent research. This book deals with the modern methodologies, key techniques and concepts that form the core of new technologies used in IT, multimedia, telecommunications as well as most fields of engineering, science and technology. It focuses on advanced techniques and methods that allow a refined extraction and processing of information, allowing efficient and effective decision making that would not be possible with classical techniques. The Author, fellow of IEEE for Pioneering contributions to time-frequency analysis and signal processing education, is an expert in the field, having written over 300 papers on the subject over a period of 25 years. This is a REAL book, not a mere collection of specialised papers, making it essential reading for researchers and practitioners in the field of signal processing. *The most comprehensive text and reference book published on the subject, all the most up to date research on this subject in one place *Key computer procedures and code are provided to assist the reader with practical implementations and applications *This book brings together the main knowledge of time-frequency signal analysis and processing, (TFSAP), from theory and applications, in a user-friendly reference suitable for both experts and beginners Remote Sensing Advanced Techniques and Platforms BoD – Books on Demand

The two-volume set LNCS 10269 and 10270 constitutes the refereed proceedings of the 20th Scandinavian Conference on Image Analysis, SCIA 2017, held in Tromsø, Norway, in June 2017. The 87 revised papers presented were carefully reviewed and selected from 133 submissions. The contributions are structured in topical sections on history of SCIA; motion analysis and 3D vision; pattern detection and recognition; machine learning; image processing and applications; feature extraction and segmentation; remote sensing; medical and biomedical image analysis; faces, gestures and multispectral analysis.

The four-volume set LNCS 13019, 13020, 13021 and 13022 constitutes the refereed proceedings of the 4th Chinese Conference on Pattern Recognition and Computer Vision, PRCV 2021, held
in Beijing, China, in October-November 2021. The 201 full papers presented were carefully reviewed and selected from 513 submissions. The papers have been organized in the following topical sections: Object Detection, Tracking and Recognition; Computer Vision, Theories and Applications, Multimedia Processing and Analysis; Low-level Vision and Image Processing; Biomedical Image Processing and Analysis; Machine Learning, Neural Network and Deep Learning, and New Advances in Visual Perception and Understanding.

This book constitutes the refereed proceedings of the Second CCF International Conference on Artificial Intelligence, CCF-ICAI 2019, held in Xuzhou, China in August, 2019. The 23 papers presented were carefully reviewed and selected from 97 submissions. The papers are organized in topical sections on deep learning, image and video processing, NLP and recommender system, machine learning algorithms, and AI applications.

This book presents the latest advances in remote-sensing and geographic information systems and applications. It is divided into four parts, focusing on Airborne Light Detection and Ranging (LiDAR) and Optical Measurements of Forests; Individual Tree Modelling; Landscape Scene Modelling; and Forest Eco-system Modelling. Given the scope of its coverage, the book offers a valuable resource for students, researchers, practitioners, and educators interested in remote sensing and geographic information systems and applications.

The 30-volume set, comprising the LNCS books 12346 until 12375, constitutes the refereed proceedings of the 16th European Conference on Computer Vision, ECCV 2020, which was planned to be held in Glasgow, UK, during August 23-28, 2020. The conference was held virtually due to the COVID-19 pandemic. The 1360 revised papers presented in these proceedings were carefully reviewed and selected from a total of 5025 submissions. The papers deal with topics such as computer vision; machine learning; deep neural networks; reinforcement learning; object recognition; image classification; image processing; object detection; semantic segmentation; human pose estimation; 3d reconstruction; stereo vision; computational photography; neural networks; image coding; image reconstruction; object recognition; motion estimation.

This volume constitutes the refereed proceedings of the 14th International Conference on Hybrid Artificial Intelligent Systems, HAIS 2019, held in León, Spain, in September 2019. The 64 full papers published in this volume were carefully reviewed and selected from 134 submissions. They are organized in the following topical sections: data mining, knowledge discovery and big data; bio-inspired models and evolutionary computation; learning algorithms; visual analysis and advanced data processing techniques; data mining applications; and hybrid intelligent applications.

This volume gathers selected, peer-reviewed original contributions presented at the International Conference on Computational Vision and Bio-inspired Computing (ICCVBIC) conference which was held in Coimbatore, India, on November 29-30, 2018. The works included here offer a rich and diverse sampling of recent developments in the fields of Computational Vision, Fuzzy, Image Processing and Bio-inspired Computing. The topics covered include computer vision; cryptography and digital privacy; machine learning and artificial neural networks; genetic algorithms and computational intelligence; the Internet of Things; and biometric systems, to name but a few. The applications discussed range from security, healthcare and epidemic control to urban computing, agriculture and robotics. In this book, researchers, graduate students and professionals will find innovative solutions to real-world problems in industry and society as a whole, together with inspirations for further research.

The rapid growth of the world population has resulted in an exponential expansion of both urban and agricultural areas. Identifying and managing such earthly changes in an automatic way poses a worth-addressing challenge, in which remote sensing technology can have a fundamental role to answer—at least partially—such demands. The recent advent of cutting-edge processing facilities has fostered the adoption of deep learning architectures owing to their generalization capabilities. In this respect, it seems evident that the pace of deep learning in the remote sensing domain remains somewhat lagging behind that of its computer vision counterpart. This is due to the scarce availability of ground truth information in comparison with other computer vision domains. In this book, we aim at advancing the state of the art in linking deep learning methodologies with remote sensing image processing by collecting 20 contributions from different worldwide scientists and laboratories. The book presents a wide range of methodological advancements in the deep learning field that come with different applications in the remote sensing landscape such as wildfire and postdisaster damage detection, urban forest mapping, vine disease and pavement marking detection, desert road mapping, road and building outline extraction, vehicle and vessel detection, water identification, and text-to-image matching.

This book presents the proceedings of the 24th European Conference on Artificial Intelligence (ECAI 2020), held in Santiago de Compostela, Spain, from 29 August to 8 September 2020. The conference was postponed from June, and much of it conducted online due to the COVID-19 restrictions. The conference is one of the principal occasions for researchers and practitioners of AI to meet and discuss the latest trends and challenges in all fields of AI and to demonstrate innovative applications and uses of advanced AI technology. The book also includes the proceedings of the 10th Conference on Prestigious Applications of Artificial Intelligence (PAIS 2020) held at the same time. A record number of more than 1,700 submissions was received for ECAI 2020, of which 1,443 were reviewed. Of these, 361 full-papers and 36 highlight papers were accepted (an acceptance rate of 25% for full-papers and 45% for highlight papers). The book is divided into three sections: ECAI full papers; ECAI highlight papers; and PAIS papers. The topics of these papers cover all aspects of AI, including Agent-based and Multi-agent Systems; Computational Intelligence; Constraints and Satisfiability; Games and Virtual Environments; Heuristic Search; Human Aspects in AI; Information Retrieval and Filtering; Knowledge Representation and Reasoning; Machine Learning; Multidisciplinary Topics and Applications; Natural Language Processing; Planning and Scheduling; Robotics; Safe, Explainable, and Trustworthy AI; Semantic Technologies; Uncertainty in AI; and
security internet; Part III: cloud computing and security; encryption and cybersecurity; information hiding; IoT security.
The 18 full and 13 short papers presented were carefully reviewed and selected from 255 submissions. There were organized in topical sections named: Image Processing, Pattern Analysis and Machine Vision; Information and Data Convergence; Disruptive Technologies for Future; E-Governance and Smart World
This volume gathers the latest advances, innovations, and applications in the field of geographic information systems and unmanned aerial vehicle (UAV) technologies, as presented by leading researchers and engineers at the 1st International Conference on Unmanned Aerial System in Geomatics (UASG), held in Roorkee, India on April 6-7, 2019. It covers highly diverse topics, including photogrammetry and remote sensing, surveying, UAV manufacturing, geospatial data sensing, UAV processing, visualization, and management, UAV applications and regulations, geo-informatics and geomatics. The contributions, which were selected by means of a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaboration among different specialists.
The ability to anticipate the impacts of global environmental changes on natural resources is fundamental to designing appropriate and optimised adaptation and mitigation strategies. However, this requires the scientific community to have access to reliable, large-scale information onspatio-temporal changes in the distribution of abiotic conditions and on the distribution, structure, composition, and functioning of ecosystems. Satellite remote sensing can provide access to some of this fundamental data by offering repeatable, standardised, and verifiable information that is directly relevant to the monitoring and management of our natural capital. This book demonstrates how ecological knowledge and satellite-basedinformation can be effectively combined to address a wide array of current natural resource management needs. By focusing on concrete applied examples in both the marine and terrestrial realms, it will help pave the way for developing enhanced levels of collaboration between the ecological andremote sensing communities, as well as shaping their future research directions. Satellite Remote Sensing and the Management of Natural Resources is primarily aimed at ecologists and remote sensing specialists, as well as policy makers and practitioners in the fields of conservation biology, biodiversity monitoring, and natural resource management. Automated road information extraction has significant applicability in transportation. It provides a means for creating, maintaining, and updating transportation network databases that are needed for purposes ranging from traffic management to automated vehicle navigation and guidance. This paper is to review literature on the subject of road extraction and to describe a study of an optimization-based method for automated road network extraction.

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