

Riegl System Configuration 3d Terrestrial Scanner

Covers the latest developments in PNT technologies, including integrated satellite navigation, sensor systems, and civil applications Featuring sixty-four chapters that are divided into six parts, this two-volume work provides comprehensive coverage of the state-of-the-art in satellite-based position, navigation, and timing (PNT) technologies and civilian applications. It also examines alternative navigation technologies based on other signals-of-opportunity and sensors and offers a comprehensive treatment on integrated PNT systems for consumer and commercial applications. Volume 1 of Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications contains three parts and focuses on the satellite navigation systems, technologies, and engineering and scientific applications. It starts with a historical perspective of GPS development and other related PNT development. Current global and regional navigation satellite systems (GNSS and RNSS), their inter-operability, signal quality monitoring, satellite orbit and time synchronization, and ground- and satellite-based augmentation systems are examined. Recent progress in satellite navigation receiver technologies and challenges for operations in multipath-rich urban environment, in handling spoofing and interference, and in ensuring PNT integrity are addressed. A section on satellite navigation for engineering and scientific applications finishes off the volume. Volume 2 of Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications consists of three parts and addresses PNT using alternative signals and sensors and integrated PNT technologies for consumer and commercial applications. It looks at PNT using various radio signals-of-opportunity, atomic clock optical, laser, magnetic field, celestial, MEMS and inertial sensors, as well as the concept of navigation Low-Earth Orbiting (LEO) satellites, GNSS-MS integration, neuroscience of navigation, and animal navigation are also covered. The volume finishes off with a collection of work on contemporary PNT applications such as survey and mobile mapping, precision agriculture, wearable systems, automated driving, train control, commercial unmanned aircraft systems, aviation, and navigation in the unique Arctic environment. In addition, this text: Serves as a complete reference and handbook for professionals and students interested in the broad range of PNT subjects Includes chapters that focus on the latest developments in GNSS and other navigation sensors, techniques, and applications Illustrates interconnecting relationships between various types of technologies in order to assure more protected, tough, and accurate PNT Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications will appeal to a wide industry professionals, researchers, and academics involved with the science, engineering, and applications of position, navigation, and timing technologies. pn21book.com

Explore GIS processing and learn to work with various tools and libraries in Python. Key Features Analyze and process geospatial data using Python libraries such as; Anaconda, GeoPandas Leverage new ArcGIS API to process geospatial data for the cloud. Explore various Python geospatial web and machine learning frameworks. Book Description Python comes with a host of open source libraries and tools that help you work on professional geoprocessing tasks without investing in expensive tools. This book will introduce Python developers, both new and experienced, to a variety of new code libraries that have been developed to perform geospatial analysis, statistical analysis, and data management. This book will use examples and code snippets that will help explain how Python 3 differs from Python 2, and how these new code libraries can be used to solve age-old problems in geospatial analysis. You will begin by understanding what geoprocessing is and explore the tools and libraries that Python 3 offers. You will then learn to use Python code libraries to read and write geospatial data. REST will then learn to perform geospatial queries within databases and learn PyQGIS to automate analysis within the QGIS mapping suite. Moving forward, you will explore the newly released ArcGIS API for Python and ArcGIS Online to perform geospatial analysis and create ArcGIS Online web maps. Further, you will deep dive into Python Geospatial web frameworks and learn to create a geospatial Web API. What you will learn Manage code libraries and abstract geospatial analysis techniques using Python 3. Explore popular code libraries that perform specific tasks for geospatial analysis. Utilize code libraries for data conversion, data management, web maps, and REST API creation. Learn techniques related to processing geospatial data in the cloud. Leverage features of Python 3 with geospatial databases such as PostGIS, SQL Server, and Spatialite. Who this book is for The audience for this book includes students, developers, and geospatial professionals who need a reference book that covers GIS data management, analysis, and automation techniques with code libraries built in Python 3.

This book is for the audience for this book includes students, developers, and geospatial professionals who need a reference book that covers GIS data management, analysis, and automation techniques with code libraries built in Python 3.

The most common natural disasters, soil creeps, mudflows, landslides etc.) are severe forms of natural disasters mostly occurring in mountainous terrain, which is subjected to specific geological, geomorphological and climatological conditions, as well as to human activities. It is a challenging task to accurately define the position, type and activity of mass movements for the purpose of creating inventory records and potential vulnerability maps. Remote sensing techniques, in combination with Geographic Information System tools, allow state-of-the-art investigation of the degree of potential mass movements and modeling surface processes for hazard and risk mapping. Similarly, through statistical prediction models, future mass-movement-prone areas can be identified and damages can to a certain extent be minimized. Issues of scale and selection of morphological attributes for the scientific analysis of mass movements call for new developments in data modeling and spatio-temporal GIS analysis. The book is a product of a cooperation between the editors and several contributing authors, addressing current issues and recent developments in GI technology and mass movements research. Its fundamental treatment of this technology includes data modeling, topography, geology, geomorphology, remote sensing, artificial neural networks, binomial regression, fuzzy logic, spatial statistics and analysis, and scientific visualization. Both theoretical and practical issues are addressed.

Structure from Motion with Multi View Stereo provides hyperscale landform models using images acquired from standard compact cameras and a network of ground control points. The technique is not limited in temporal frequency and can provide point cloud data comparable in density and accuracy to those generated by terrestrial and airborne laser scanning at a fraction of the cost. It therefore offers exciting opportunities to characterise surface topography in unprecedented detail and, with multi-temporal data, to detect elevation, position and volumetric changes that are symptomatic of earth surface processes. This book firstly places Structure from Motion in the context of other digital surveying methods and details the Structure from Motion workflow including available software packages and assessments of uncertainty and accuracy. It then critically reviews current usage of Structure from Motion in the geosciences, provides a synthesis of recent validation studies and looks to the future by highlighting opportunities arising from developments in allied disciplines. This book will appeal to academics, students and industry professionals because it balances technical knowledge of the Structure from Motion workflow with practical guidelines for image acquisition, image processing and data quality assessment and includes case studies that have been contributed by experts from around the world.

Detection, Modelling, Early Warning and Mitigation Using Geoinformation Technology

Position, Navigation, and Timing Technologies in the 21st Century, Volumes 1 and 2

Challenges, Potentialities, and Issues

COVID-19 Pandemic, Geospatial Information, and Community Resilience

Paradigms and Applications in Forest Landscape Modeling

Sensor Technologies for Civil Infrastructures

An increasing population faces the growing demand for agricultural products and accurate global climate models that account for individual plant morphologies to predict favorable human habitat. Both demands are rooted in an improved understanding of the mechanistic origins of plant development. Such understanding requires geometric and topological descriptors to characterize the phenotype of plants and its link to genotypes. However, the current plant phenotyping framework relies on simple length and diameter measurements, which fail to capture the exquisite architecture of plants. The Research Topic “Morphological Plant Modeling: Unleashing Geometric and Topological Potential within the Plant Sciences” is the result of a workshop held at National Institute for Mathematical and Biological Synthesis (NIMBioS) in Knoxville, Tennessee. From 2.–4. September 2015 over 40 scientists from mathematics, computer science, engineering, physics and biology came together to set new frontiers in combining plant phenotyping with recent results from shape theory at the interface of geometry and topology. In doing so, the Research Topic synthesizes the views from multiple disciplines to reveal the potential of new mathematical concepts to analyze and quantify the relationship between morphological plant features. As such, the Research Topic bundles examples of new mathematical techniques including persistent homology, graph-theory, and shape statistics to tackle questions in crop breeding, developmental biology, and vegetation modeling. The challenge to model plant morphology under field conditions is a central theme of the included papers to address the problems of climate change and food security, that require the integration of plant biology and mathematics from geometry and topology research applied to imaging and simulation techniques. The introductory white paper written by the workshop participants identifies future directions in research, education and policy making to integrate biological and mathematical approaches and to strengthen research at the interface of both disciplines.

This edition presents the most prominent topics and applications of digital image processing, analysis, and computer graphics in the field of cultural heritage preservation. The text assumes prior knowledge of digital image processing and computer graphics fundamentals. Each chapter contains a table of contents, illustrations, and figures that elucidate the presented concepts in detail, as well as a chapter summary and a bibliography for further reading. Well-known experts cover a wide range of topics and related applications, including spectral imaging, automated restoration, computational reconstruction, digital reproduction, and 3D models.

Intelligent autonomous systems are emerged as a key enabler for the creation of a new paradigm of services to humankind, as seen by the recent advancement of autonomous cars licensed for driving in our streets, of unmanned aerial and underwater vehicles carrying out hazardous tasks on-site, and of space robots engaged in scientific as well as operational missions, to list only a few. This book aims at serving the researchers and practitioners in related fields with a timely dissemination of the recent progress on intelligent autonomous systems, based on a collection of papers presented at the 12th International Conference on Intelligent Autonomous Systems, held in Jeju, Korea, June 26–29, 2012. With the theme of “Intelligence and Autonomy for the Service to Humankind, the conference has covered such diverse areas as autonomous ground, aerial, and underwater vehicles, intelligent transportation systems, personal/domestic service robots, professional service robots for surgery/rehabilitation, rescue/security and space applications, and intelligent autonomous systems for manufacturing and healthcare. This volume 1 includes contributions devoted to Autonomous Ground Vehicles and Mobile Manipulators, as well as Unmanned Aerial and Underwater Vehicles and Bio-inspired Robotics.

This book focuses on new technologies and multi-method research designs in the field of modern archaeology, which increasingly crosses academic boundaries to investigate past human–environmental relationships and to reconstruct palaeolandscapes. It aims at establishing the concept of Digital Geoaerchology as a novel approach of interdisciplinary collaboration situated at the scientific interface between classical studies, geosciences and computer sciences. Among others, the book includes topics such as geographic information systems, spatiotemporal analysis, remote sensing applications, laser scanning, digital elevation models, geophysical prospecting, data fusion and 3D visualisation, categorized in four major sections. Each section is introduced by a general thematic overview and followed by case studies, which vividly illustrate the broad spectrum of potential applications and new research designs. Mutual fields of work and common technologies are identified and discussed from different scholarly perspectives. By stimulating knowledge transfer and fostering interdisciplinary collaboration, Digital Geoaerchology helps generate valuable synergies and contributes to a better understanding of ancient landscapes along with their forming processes. Chapters 1, 2, 6, 8 and 14 are published open access under a CC BY 4.0 license at link.springer.com.

Chances of German Vietnamese Cooperation : Freiburger Forschungsforum 60. Berg- und Hüttenmännischer Tag 2009

Precision agriculture '13

Geo-information

Laser Scanning

Applications to Civil and Environmental Engineering, Geophysics, Architecture, Archeology and Cultural Heritage

Innovations in 3D Geo Information Systems

Advice and Guidance on the Use of Laser Scanning in Archaeology and Architecture

Published on the occasion of the XXIst Congress of the International Society for Photogrammetry and Remote Sensing (ISPRS) in Beijing, China in 2008, *Advances in Photogrammetry, Remote Sensing and Spatial Information Sciences: 2008 ISPRS Congress Book* is a compilation of 34 contributions from 62 researchers active within the ISPRS. *The book covers Geo-information technology can be of considerable use in disaster management, but with considerable challenge in integrating systems, interoperability and reliability. This book provides a broad overview of geo-information technology, software, systems needed, currently used and to be developed for disaster management. The text invites discussion on systems and requirements for use of geo-information under time and stress constraints and unfamiliar situations, environments and circumstances.*

Precision agriculture is now 'main stream' in agriculture and is playing a key role as the industry comes to terms with the environment, market forces, quality requirements, traceability, vehicle guidance and crop management. Research continues to be necessary and needs to be reported and disseminated to a wide audience. This book contains peer reviewed papers presented at the 10th European Conference on Precision Agriculture held in Lleida, Spain. The papers reflect the wide range of disciplines that impinge on precision agriculture: technology, crop science, soil science, agronomy, information technology, decision support, remote sensing and others. The broad range of research topics reported will be a valuable resource for researchers, advisors, teachers and professionals in agriculture long after the conference has finished.

Building Information Modelling (BIM) in Design, Construction, and Operations contains the proceedings of the first in a planned series of conferences dealing with design coordination, construction, maintenance, operation and decommissioning. The book gives details of how BIM tools and techniques have fundamentally altered the manner in which modern construction teams operate, the processes through which designs are evolved, and the relationships between conceptual, detail, construction and life cycle stages. The papers contributed by experts from industry, practice and academia, debate key topics, develop innovative solutions, and predict future trends. The interdisciplinary nature of the contents and the collaborative practices discussed, so important within the built environment, will appeal to those engaged in design, surveying, visualisation, infrastructure, real estate, construction law, insurance, and facilities management. Topics covered include: BIM in design coordination; BIM in construction operations; BIM in building operation and maintenance; BIM and sustainability; BIM and collaborative working and practices; BIM health and safety and BIM-facilities management integration, among others.

Integrated Satellite Navigation, Sensor Systems, and Civil Applications

Handbook on Advances in Remote Sensing and Geographic Information Systems

LACONA VI Proceedings, Vienna, Austria, Sept. 21–25, 2005

Terrigenous Mass Movements

Global Applications and Lessons

UAV or Drones for Remote Sensing Applications

Multidisciplinary Investigations in Palpa and Nasca, Peru

This work presents case studies of applications of Geotechnology such as Geography Information Systems, virtual reality and cellular automaton and multi-agent systems in the field of urban planning and design.These are joint research presentations with students and colleagues from Kanazawa University. All these case studies are about application in Japanese or Chinese cities, which are on-field examples reflecting the enormous spread of geo-computation technology. Nevertheless, the concepts have wide applicability to other contexts. The work can be classified into three types of Geotechnological applications at different levels of urban spaces, which are relevant to different kinds of urban planning and development projects. The book is comprised of three parts: Part 1: Geosimulation and land use plan Part 2: Geo Visualization and urban design Part 3: Geography information system and planning support

This book covers various aspects of spatial data modelling specifically regarding three-dimensional (3D) modelling and structuring. The realization of “true” 3D geoinformation spatial systems requires a high input, and the developmental process is taking place in various research centers and universities around the globe. The development of such systems and solutions, including the modelling theories are presented in this book. This heavily-illustrated book covers recent developments in archaeometry and offers a multidisciplinary approach to reconstructing complex cultural histories. It also presents a detailed history of human development in South America’s Nasca region.

Ever since the invention of laser by Schawlow and Townes in 1958, various innovative ideas of laser-based applications emerge every year. At the same time, scientists and engineers keep on improving laser’s power density, size, and cost which patch up the gap between theories and implementations. More importantly, our everyday life is changed and influenced by lasers even though we may not be fully aware of its existence. For example, it is there in cross-continent phone calls, price tag scanning in supermarkets, pointers in the classrooms, printers in the offices, accurate metal cutting in machine shops, etc. In this volume, we focus the recent developments related to laser scanning, a very powerful technique used in features detection and measurement. We invited researchers who do fundamental works in laser scanning theories or apply the principles of laser scanning to tackle problems encountered in medicine, geodesic survey, biology and archaeology. Twenty-eight chapters contributed by authors around the world to constitute this comprehensive book.

Laser Radar Technology and Applications XIV

Reconstruction and Analysis of 3D Scenes

Heritage Building Information Modelling for Implementing UNESCO Procedures

Theory and Applications

Technologies, Applications and the Environment

Principles and Processing

Applied Geology for Major Engineering Projects

In the current age of information explosion, newly invented technological sensors and software are now tightly integrated with our everyday lives. Many sensor processing algorithms have incorporated some forms of computational intelligence as part of their core framework in problem solving. These algorithms have the capacity to generalize and discover knowledge for themselves and learn new information whenever unseen data are captured. The primary aim of sensor processing is to develop techniques to interpret, understand, and act on information contained in the data. The interest of this book is in developing intelligent signal processing in order to pave the way for smart sensors. This involves mathematical advancement of nonlinear signal processing theory and its applications that extend far beyond traditional techniques. It bridges the boundary between theory and application, developing novel theoretically inspired methodologies targeting both longstanding and emergent signal processing applications. The topic ranges from phishing detection to integration of terrestrial laser scanning, and from fault diagnosis to bio-inspiring filtering. The book will appeal to established practitioners, along with researchers and students in the emerging field of smart sensors processing.

A systematic, in-depth introduction to theories and principles of Light Detection and Ranging (LiDAR) technology is long overdue, as it is the most important geospatial data acquisition technology to be introduced in recent years. An advanced discussion, this text fills the void. Professionals in fields ranging from geology, geography and geomatics to physics, transport physics, and new enforcement will benefit from this comprehensive discussion of topographic LiDAR principles, systems, data acquisition, and data processing techniques. The book covers ranging and scanning fundamentals, and broad, contemporary analysis of airborne LiDAR systems, as well as those situated on land and in water. The authors present data collection at the signal level in terms of waveforms and their properties; at the system level with regard to calibration and georeferencing; and at the data level to discuss error budget, quality control, and data organization. They devote the bulk of the book to LiDAR data processing and information extraction and elaborate on recent developments in building extraction and reconstruction, highlighting quality and performance evaluations. There is also an extensive discussion of the state-of-the-art technological developments used in: filtering algorithms for digital terrain model generation; strip adjustment of data for registration; co-registration of LiDAR data with imagery; forestry inventory; and surveying. Readers get insight into why LiDAR is the effective tool of choice to collect massive volumes of explicit 3-D data with unprecedented accuracy and simplicity. Compiled by leading experts talking about much of their own pioneering work, this book will give researchers, professionals, and senior students novel ideas to supplement their own experience and practices.

Geomatics, the handling and processing of information and data about the Earth, is one geoscience discipline that has seen major changes in the last decade, as mapping and observation systems become ever more sensitive and sophisticated. This book is a unique and in-depth survey of the field, which has a central role to play in tackling a host of environmental issues faced by society. Covering all three strands of geomatics - applications, information technology and surveying - the chapters cover the history and background of the subject, the technology employed both to collect and disseminate data, and the varied applications to which geomatics can be put, including urban planning, assessment of biodiversity, disaster management and land administration. Relevant professionals, as well as students in a variety of disciplines such as geography and surveying, will find this book required reading. This rapidly developing field uses increasingly complex and accurate systems. Today, technology enables us to capture geo-data in full 3D as well as to disseminate it via the Web at the speed of light. We are able to continuously image the world from space at resolutions of up to 50 cm. Airborne LiDAR (laser surveying) sensors can be combined with digital camera technology to produce geometrically correct images of the Earth’s surface, while integrating these with large-scale topographic maps and terrestrial as well as aerial images to produce 3D cityscapes that computer users can explore from their desktops.

Proceedings of SPIE present the original research papers presented at SPIE conferences and other high-quality conferences in the broad-ranging fields of optics and photonics. These books provide prompt access to the latest innovations in research and technology in their respective fields. Proceedings of SPIE are among the most cited references in patent literature.

Geospatial Techniques in Urban Planning

Position, Navigation, and Timing Technologies in the 21st Century

Analysis, Restoration, and Reconstruction of Ancient Artworks

Sensor Signal and Information Processing II

Building Information Modelling (BIM) in Design, Construction and Operations

Topographic Laser Ranging and Scanning

Asian and Pacific Coasts 2009

The first edition of 3D Laser Scanning for Heritage was published in 2007 and originated from the Heritage3D project that in 2006 considered the development of professional guidance for laser scanning in archaeology and architecture. Publication of the second edition in 2011 continued the aims of the original document in providing updated guidance on the use of three-dimensional (3D) laser scanning across the heritage sector. By reflecting on the technological advances made since 2011, such as the speed, resolution, mobility and portability of modern laser scanning systems and their integration with other sensor solutions, the guidance presented in this third edition should assist archaeologists, conservators and other cultural heritage professionals unfamiliar with the approach in making the best possible use of this now highly developed technique.

The field of “Laser-based Applications in Heritage” is gaining importance and restorers and laser scientists now work together to develop new applications. This book presents a fascinating and valuable application of laser technology. The proceedings of the 2005 congress addresses scientists, conservator-restorers, companies, architects, decision-makers and other experts involved in conservation projects or in the research of new laser equipment.

Sensor Technologies for Civil Infrastructure, Volume 1: Sensing Hardware and Data Collection Methods for Performance Assessment, Second Edition, provides an overview of sensor hardware and its use in data collection. The first chapters provide an introduction to sensing for structural performance assessment and health monitoring, and an overview of commonly used sensors and their data acquisition systems. Further chapters address different types of sensor including piezoelectric transducers, fiber optic sensors, acoustic emission sensors, and electromagnetic sensors, and the use of these sensors for assessing and monitoring civil infrastructures. The new edition now includes chapters on machine learning methods an reliability analysis for structural health monitoring. All chapters have been revised to include the latest advances in materials (such as piezoelectric and mechanoluminescent materials), technologies (such as LiDAR), and applications. Describes sensing hardware and data collection, covering a variety of sensors including LiDAR Examines fiber optic systems, acoustic emission, piezoelectric sensors, electromagnetic sensors, terahertz technologies, ultrasonic methods, and radar and millimeter wave technology Covers strain gauges, micro-electro-mechanical systems (MEMS), multifunctional materials and nanotechnology for sensing, and vision-based sensing and lasers Includes new chapters on machine learning methods and reliability analysis

3D surface representation has long been a source of information describing surface character and facilitating an understanding of system dynamics from micro-scale (e.g. sand transport) to macro-scale (e.g. drainage channel network evolution). Data collection has been achieved through field mapping techniques and the use of remotely sensed data. Advances in the latter field have been considerable in recent years with new rapid-acquisition methods being developed centered around laser based technology. The advent of airborne and field based laser scanning instruments has allowed researchers to collect high density accurate data sets and these are revealing a wealth of new information and generating important new ideas concerning terrain characterisation and landform dynamics. The proposed book collates a series of invited peer reviewed papers presented at a conference on geoinformatics and LiDAR to be held at the National Centre for Geocomputation based in the National University of Ireland, Maynooth. Current constraints in field survey and DEM construction are reviewed together with the latest advances and issues around the new technology. The utility of the data in process modelling is also covered. The book will be of great value to researchers in the field of geomorphology, geostatistics, remote sensing and GIS and will prove extremely useful to students and practitioners concerned with terrain analysis. The proposed work will:

Highlight major technological breakthrough in 3D data collection. Feature examples of application across a wide range of environmental areas. Critically evaluate the role of laser based techniques in the environment. Detail theory and application of laser techniques in the natural environment.

Engineering Geology for Infrastructure Planning in Europe

Engineering Geology for Society and Territory - Volume 6

Mastering Geospatial Analysis with Python

Volume 1: Proceedings of the 12th International Conference IAS-12, Held June 26–29, 2012, Jeju Island, Korea

3D Laser Scanning for Heritage

Close-Range Photogrammetry and 3D Imaging

Digital Geoaerchology

Geologists and civil engineers related to infrastructure planning, design and building describe professional practices and engineering geological methods in different European infrastructure projects.

Building Information Modelling (BIM) is being debated, tested and implemented wherever you look across the built environment sector. This book is about Heritage Building Information Modelling (HBIM), which necessarily differs from the commonplace applications of BIM to new construction. Where BIM is being used in the built environment, it is still very much in its infancy, and the data it generates is often limited and fragmented. However, its use as an operational and management tool for existing buildings, particularly heritage buildings, is lagging behind. The first of its kind, this book aims to clearly define the scope for HBIM and present cutting-edge research findings alongside international case studies, before outlining challenges for the future of HBIM research and practice. After an extensive introduction to HBIM, the core themes of the book are arranged into four parts: Restoration philosophies in practice; Data capture and visualisation for maintenance and repair; Building performance; Stakeholder engagement. This book will be a key reference for built environment practitioners, researchers, academics and students engaged in BIM, HBIM, building energy modelling, building surveying, facilities management and heritage conservation more widely.

This unique work presents a detailed review of the processing and analysis of 3D point clouds. A fully automated framework is introduced, incorporating each aspect of a typical end-to-end processing workflow, from raw 3D point cloud data to semantic objects in the scene. For each of these components, the book describes the theoretical background, and compares the performance of the proposed approaches to that of current state-of-the-art techniques. Topics and features: reviews techniques for the acquisition of 3D point cloud data and for point quality assessment; explains the fundamental concepts for extracting features from 2D imagery and 3D point cloud data; proposes an original approach to the keypoint-based point cloud registration; discusses the enrichment of 3D point clouds by additional information acquired with a thermal camera, and describes a new method for thermal 3D mapping; presents a novel framework for 3D scene analysis.

This book provides the latest research on and applications of advanced GNSS (Global Navigation Satellite System) and 3D spatial techniques in the fields of Civil and Environmental Engineering, Geophysics, Architecture, Archaeology and Cultural Heritage. It offers an updated reference guide on the above-mentioned topics for undergraduate and graduate students, PhDs, researchers, professionals and practitioners alike.

Heritage Building Information Modelling

Intelligent Autonomous Systems 12

Structure from Motion in the Geosciences

Volume 1: Sensing Hardware and Data Collection Methods for Performance Assessment

Lasers in the Conservation of Artworks

Advances in Photogrammetry, Remote Sensing and Spatial Information Sciences: 2008 ISPRS Congress Book

An Emerging Technology in Structural Engineering

The main aim of this book is to develop and explore the value of new innovative digital content to help satisfy UNESCO’s World Heritage nomination file requirements. Through a detailed exploration of two BIM case studies from Jeddah, Saudi Arabia, the book uniquely connects the use of Heritage BIM to the documentation methods used by UNESCO and demonstrates how this provides a contribution to both countries with heritage sites and UNESCO as an organisation. The research and practical examples in the book seek to address both the lack of a comprehensive method of submitting a nomination file to UNESCO and the lack of authentic engineering information in countries where extensive heritage sites exist. It looks at answering the following questions: How can Heritage Building Information Modelling (HBIM) assist in the conservation, protection and upgrading of historical buildings? How can HBIM provide information on creating the missing information for the assignment of UNESCO’s World Heritage status? What additional value can a sustainable update of HBIM data provide for such sites? How can HBIM improve the cultural value of heritage buildings in the short, medium, and long term, as well as provide a better future for historical buildings? This book will be useful reading for researchers and practitioners in the areas of heritage conservation, archaeology, World Heritage nomination, HBIM, digital technology and engineering, remote sensing, laser scanning, and architectural technology.

This book provides an overview on the evolution of laser scanning technology and its noticeable impact in the structural engineering domain. It provides an up-to-date synthesis of the state-of-the-art of the technology for the reverse engineering of built constructions, including terrestrial, mobile, and different portable solutions, for laser scanning. Data processing of large point clouds has experienced an important advance in the last years, and thus, an intense activity in the development of automated data processing algorithms has been noticed. Thus, this book aims to provide an overview of the state-of-the-art algorithms, different best practices and most recent processing tools in connection to particular applications. Readers will find this a comprehensive book, that updates the practice of laser scanning for researchers and professionals not only from the geomatic domain, but also other fields such as structural and construction engineering. A set of successful applications to structural engineering are illustrated, including also synergies with other technologies, that can inspire professionals to adopt laser scanning in their day-to-day activity. This cutting-edge edited volume will be a valuable resource for students, researchers and professional engineers with an interest in laser scanning and its applications in the structural engineering domain.

Modern numerical techniques for landslides analysis, and modern numerical techniques for landslides analysis. Landslides are a reoccurring problem across the world and need to be properly studied for their mitigation and control. Due to increased natural and anthropogenic activities, chances of landslide occurrence and associated hazards have increased. The book focuses on landslide dynamics, mechanisms and processes along with hazard mitigation using geo-engineering, structural, geophysical and numerical tools. The book contains a wealth of the latest information on all aspects of theory, practices and modelling tools and techniques involved in prediction, prevention, monitoring, mitigation and risk analysis of landslide hazards. This book will bring the reader up to date on the latest trends in landslide studies and will help planners, engineers, scientists and researchers working on landslide engineering.

“The Open Access version of this book, available at https://www.taylorfrancis.com/books/oa-edit/10.1201/9781003181590, has been made available under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 license.” Geospatial information plays an important role in managing location dependent pandemic situations across different communities and domains. Geospatial information and technologies are particularly critical to strengthening urban and rural resilience, where economic, agricultural, and various social sectors all intersect. Examining the United Nations’ SDGs from a geospatial lens will ensure that the challenges are addressed for all populations in different locations. This book, with worldwide contributions focused on COVID-19 pandemic, provides interdisciplinary analysis and multi-

Geo-information for Disaster Management

New Technologies for Archaeology

From Irregularly Distributed 3D Points to Object Classes

Landslides: Theory, Practice and Modelling

New Techniques for Interdisciplinary Human-Environmental Research

Explore GIS processing and learn to work with GeoDjango, CARTOframes and MapboxGL-Jupyter

Resource and Environmental Technology

This book is one out of 8 IAG XII Congress volumes, and deals with the theme of applied geology, which is a critical theme for the global economy. In the international, multidisciplinary approach to major engineering projects (either to macro- or mega-scale), the application of geological investigation techniques is fundamental for properly selecting the location sites, planning the construction and maintaining the infrastructures. The contributions in this book include not only engineering constructions but also case studies related to large projects on geo-resources exploration and extraction (minerals, petroleum and groundwater), energy production (hydropower, geothermal, nuclear and others), transportation (railway and highway) and waste disposal as well as the environmental management of these and other activities. The Engineering Geology for Society and Territory volumes of the IAG XII Congress held in Torino from September 15-19, 2014, analyze the dynamic role of engineering geology in our changing world and build on the four main themes of the congress: Environment, processes, issues, and approaches. The congress topics and subject areas of the 8 IAG XII Congress volumes are: 1. Climate Change and Engineering Geology 2. Landslide Processes 3. River Basins, Reservoir Sedimentation and Water Resources 4. Marine and Coastal Processes 5. Urban Geology, Sustainable Planning and Landscape Exploitation 6. Applied Geology for Major Engineering Projects 7. Education, Professional Ethics and Public Recognition of Engineering Geology 8. Preservation of Cultural Heritage.

This book is a printed edition of the Special Issue “UAV or Drones for Remote Sensing Applications” that was published in *Sensors* This is the third edition of the well-known guide to close-range photogrammetry. It provides a thorough presentation of the methods, mathematics, systems and applications which comprise the subject of close-range photogrammetry, which uses accurate imaging techniques to analyse the three-dimensional shape of a wide range of manufactured and natural objects.

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 Models. 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.

1st of April 2009, Orlando, Florida, United States

Integrated Satellite Navigation, Sensor Systems, and Civil Applications, Set

New Advanced GNSS and 3D Spatial Techniques

Digital Imaging for Cultural Heritage Preservation

A European Perspective

Morphological Plant Modeling: Unleashing Geometric and Topological Potential Within the Plant Sciences

Volume 1

New Advanced GNSS and 3D Spatial TechniquesApplications to Civil and Environmental Engineering, Geophysics, Architecture, Archeology and Cultural HeritageSpringer

Laser Scanning for the Environmental Sciences