Digital Terrain Modelling Development And Applications In A Policy Support Environment Lecture Notes In Geoinformation And Cartography

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Proceedings of the Meeting on Planning and Implementing Forest Operations to Achieve Sustainable Forests Council on Forest Engineering. Meeting 1996
Earth Resources 1983
Spatial Modeling in GIS and R for Earth and Environmental Sciences Hamid Reza Pourghasemi 2019-01-18 Spatial Modeling in GIS and R for Earth and Environmental Sciences offers an integrated approach to spatial modelling using both GIS and R. Given the importance of Geographical Information Systems and geostatistics across a variety of applications in Earth and Environmental Science, a clear link between GIS and open source software is essential for the study of spatial objects or phenomena that occur in the real world and facilitate problem-solving. Organized into clear sections on applications and using case studies, the book helps researchers to more quickly understand GIS data and formulate more complex conclusions. The book is the first reference to provide methods and applications for combining the use of R and GIS in modeling spatial processes. It is an essential tool for students and researchers in earth and environmental science, especially those looking to better utilize GIS and spatial modeling. Offers a clear, interdisciplinary guide to serve researchers in a variety of fields, including hazards, land surveying, remote sensing, cartography, geophysics, geology, natural resources, environment and geography Provides an overview, methods and case studies for each application Expresses concepts and methods at an appropriate level for both students and new users to learn by example
Geoinformation Technologies for Geo-Cultural Landscapes: European Perspectives Andreas Vassilopoulos 2008-12-04 The focal main objective of the book is to constitute a meaningful linkage among research problems, geoinformation methods and corresponding applications. The research goals, related both to theoretical and practical issues, derive from multidisciplinary fields such as archaeology, history, geography, landscape planning, environment, geoinformation
General Technical Report NC. 1981
Mathematical Morphology in Geomorphology and GISci Behara Seshadri Daya Sagar 2016-04-19 Mathematical Morphology in Geomorphology and GISci presents a multitude of mathematical morphological approaches for processing and analyzing digital images in quantitative geomorphology and geographic information science (GISci). Covering many interdisciplinary applications, the book explains how to use mathematical morphology not only to perform
Handbook on Advances in Remote Sensing and Geographic Information Systems Margarita N. Favorskaya 2017-02-24 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.
Digital Terrain Modeling Zhilin Li 2004-11-29 Written by experts, Digital Terrain Modeling: Principles and Methodology provides comprehensive coverage of recent developments in the field. The topics include terrain analysis, sampling strategy, acquisition methodology, surface modeling principles, triangulation algorithms, interpolation techniques, on-line and off-line quality control in data acquisition, DTM accuracy assessment and mathematical models for DTM accuracy prediction, multi-scale representation, data management, contouring, visual analysis (or visualization), the derivation of various types of terrain parameters, and future development and applications.
GIS Methodologies for Developing Conservation Strategies Basil G. Savitsky 1998-04-28 Tropical habitats may contain more than a third of the world's plant and animal species; Costa Rica alone is home to one of the highest levels of biodiversity per unit area in the world, and stands at center stage in worldwide conservation efforts. Within such regions, the use of state-of-the-art digital mapping technologies—sophisticated techniques that are relatively inexpensive and accessible—represents the future of conservation planning and policy. These methods, which employ satellites to obtain visual data on landscapes, allow environmental scientists to monitor encroachment on indigenous territories, trace park boundaries through unmarked wilderness, and identify wildlife habitats in regions where humans have limited access. Focusing on the rich biodiversity of Costa Rica, the contributors demonstrate the use of geographic information systems (GIS) to enhance conservation efforts. They give an overview of the spatial nature of conservation and management and the current status of digital mapping in Costa Rica; a review of the basic principles behind digital mapping technologies; a series of case studies using these technologies at a variety of scales and for a range of conservation and management activities; and the results of the Costa Rican gap analysis project. GIS Methodologies for Developing Conservation Strategies provides powerful tools for those involved in decision-making about the natural environment, particularly in developing nations like Costa Rica where such technologies have not yet been widely adopted. For specialists in such areas as geography, conservation biology, and wildlife and natural resource management, the combination of conceptual background and case examples make the book a crucial addition to the literature.
Appropriate Technologies for Environmental Protection in the Developing World Ernest K. Yanful 2009-02-19 This book is the first edited compilation of selected, refereed papers submitted to ERTEP 2007. The selected papers either dealt with technologies or scientific work and policy findings that address specific environmental problems affecting humanity in general, but more specifically, people and ecosystems in developing countries. It was not necessary for the work to have been done in a developing country, but the findings and results must be appropriate or applicable to a developing country setting. It is acknowledged that environmental research, technology applications and policy implementation have been demonstrated to improve environmental sustainability and protection in several developed economies. The main argument of the book is that similar gains can be achieved in developing economies and economies in transition. The book is organized into six chapters along some of the key themes discussed at the conference: Environmental Health Management, Sustainable Energy and Fuel, Water Treatment, Purification and Protection, Mining and Environment, Soil Stabilization, and Environmental Monitoring. It is hoped that the contents of the book will provide an insight into some of the environmental and health mana- ment challenges confronting the developing world and the steps being taken to address them.
Advances in Digital Terrain Analysis Qiming Zhou 2008-02-21 Terrain analysis has attracted research studies from geographers, surveyors, engineers and computer scientists. The contributions in this book represent the state-of-the-art of terrain analysis methods and techniques in areas of digital representation, morphological and hydrological models, uncertainty and applications of terrain analysis. The book will appeal to postgraduate and senior undergraduate students who take advanced courses in GIS and geographical analysis.
Environmental Applications of Digital Terrain Modeling John P. Wilson 2018-04-23 "This book examines how the methods and data sources used to generate DEMs and calculate land surface parameters have changed over the past 25 years. The primary goal is to describe the state-of-the-art for a typical digital terrain modeling workflow that starts with data capture, continues with data preprocessing and DEM generation, and concludes with the calculation of one or more primary and secondary land surface parameters"--
Digital Terrain Modeling Zhilin Li 2004-11-29 Written by experts, Digital Terrain Modeling: Principles and Methodology provides comprehensive coverage of recent developments in the field. The topics include terrain analysis, sampling strategy, acquisition methodology, surface modeling principles, triangulation algorithms, interpolation techniques, on-line and off-line quality control in data acquisition, DTM accuracy assessment and mathematical models for DTM accuracy prediction, multi-scale representation, data management, contouring, visual analysis (or visualization), the derivation of various types of terrain parameters, and future development and applications.
Recent Trends in Environmental Hydraulics Monika B. Kalinowska 2020-02-18 This book presents an overview of current research problems and advances in theoretical and applied aspects of environmental hydraulics. The rapid development of this branch of water studies in recent years has contributed to our fundamental understanding of processes in natural aquatic systems and helped provide solutions for civil engineering and water resources management. The book features comprehensively reviewed versions of invited lectures and regular presentations given at the 38th International School of Hydraulics, held May 21–24, 2019, in Łąck, Poland. With papers by leading international experts as well as young researchers from around the globe, it covers recent findings from laboratory and field studies, numerical modeling related to sediment and pollutant transport processes in rivers, fluvial morphodynamics, flow in vegetated channels and hydraulic structures in rivers and estuaries.
Digital Elevation Model Technologies and Applications David Francis Maune 2001
Digital Terrain Modelling 2007
Digital Terrain Modelling Robert Joseph Peckham 2007-07-30 This publication is the first book on the development and application of digital terrain modeling for regional planning and policy support. It is a compilation of research results by international research groups at the European Commission’s Joint Research Centre, providing scientific support to the development and implementation of EU environmental policy. This practice-oriented book is recommended reading for practising environmental modelers and GIS experts working on regional planning and policy support applications.
Representing, Modeling, and Visualizing the Natural Environment Nick Mount 2008-12-22 The explosion of public interest in the natural environment can, to a large extent, be attributed to greater public awareness of the impacts of global warming and climate change. This has led to increased research interest and funding directed at studies of issues affecting sensitive, natural environments. Not surprisingly, much of this work has required the innovative application of GIS and has led to a crucial research question: How should the environment be represented, modeled, analyzed, and visualized within a GIS? With contributions from recognized international experts, Representing, Modeling, and Visualizing the Natural Environment explores the interplay between data representation, modeling, and visualization in environmental studies. It reviews state-of-the-art GIS applications for the natural environment and presents them in the context of a range of recent studies. This focus identifies analytical challenges and illustrates broader opportunities for applying GIS within other areas of the sciences and social sciences. The integrated approach reflects the need for a single volume covering all aspects While many texts cover aspects of GIS application within an environmental context, few of these books focus specifically on the natural environment nor do they integrate the questions that encompass the full process of enquiry associated with GIS application in studies of the environment. The thirteenth volume in the widely recognized Innovations of GIS series, this book investigates each of these questions in turn, explicitly addressing all aspects of GIS application in the natural environment.
Terrain Analysis John P. Wilson 2000-08-03 The only reference on the use of GIS and related technologies in terrain analysis In this landmark publication, reflecting the collaborative effort of thirteen research groups based in four countries, leading experts detail how GIS and related technologies, such as GPS and remote sensing, are now being used, with the aid of computer modeling, in terrain analysis. Continuing the innovative work of Professor Ian Moore, a visionary who saw terrain analysis as a robust method for modeling the large areas and complex spatial patterns of environmental systems, Terrain Analysis puts into action TAPES, or Terrain Analysis Programs for Environmental Sciences, Dr. Moore's innovative tool for terrain analysis. The book's contributors describe how TAPES are applied to specific geomorphologic problems, explain the algorithms used in current terrain analysis software, and examine the interpretation and use of terrain attributes in predictive models. With expert coverage of terrain analysis in the digital age, Terrain Analysis will be welcomed by ecologists, environmental engineers, geographers, and hydrologists who increasingly depend on GIS, GPS, and remote sensing.
Digital Terrain Analysis in Soil Science and Geology Igor Florinsky 2012 "This book is the first attempt to synthesize knowledge on theory, methods, and applications of digital terrain analysis in the context of multiscale problems of soil science and geology. The content of the book is based on long-standing, interdisciplinary research of the author. The book is addressed to geomorphometrists, soil scientists, geologists, geoscientists, geomorphologists, geographers, and GIS scientists (at scholar, lecturer, and postgraduate student levels, with mathematical skills). This book is also intended for the GIS professionals in industry and research laboratories focusing on geoscientific and soil research. The book is divided into three parts. Part I represents main concepts, principles, and methods of digital terrain modeling. Part II discusses various aspects of the use of digital terrain analysis in soil science. Part III looks at applications of digital terrain modeling in geology"--
Geospatial Technologies in Land Resources Mapping, Monitoring and Management G. P. Obi Reddy 2018-09-11 This book offers an overview of geospatial technologies in land resources mapping, monitoring and management. It consists of four main sections: geospatial technologies - principles and applications; geospatial technologies in land resources mapping; geospatial technologies in land resources monitoring; and geospatial technologies in land resources management. Each part is divided into detailed chapters that include illustrations and tables. The authors, from leading institutes, such as the ICAR-NBSS&LUP, IIT-B, NRSC, ICRISAT, share their experiences and offer case studies to provide advanced insights into the field. It is a valuable resource for the scientific and the teaching community, extension scientists at research institutes and agricultural universities/colleges as well as those involved in planning and managing land resources for sustainable agriculture and livelihood security.
Large-scale 3D Environmental Modelling and Visualisation for Flood Hazard Warning Chen Wang 2009 3D environment reconstruction has received great interest in recent years in areas such as city planning, virtual tourism and flood hazard warning. With the rapid development of computer technologies, it has become possible and necessary to develop new methodologies and techniques for real time simulation for virtual environments applications. This thesis proposes a novel dynamic simulation scheme for flood hazard warning. The work consists of three main parts: digital terrain modelling; 3D environmental reconstruction and system development; flood simulation models. The digital terrain model is constructed using real world measurement data of GIS, in terms of digital elevation data and satellite image data. An NTSP algorithm is proposed for very large data assessing, terrain modelling and visualisation. A pyramidal data arrangement structure is used for dealing with the requirements of terrain details with different resolutions. The 3D environmental reconstruction system is made up of environmental image segmentation for object identification, a new shape match method and an intelligent reconstruction system. The active contours-based multi-resolution vector-valued framework and the multi-seed region growing method are both used for extracting necessary objects from images. The shape match method is used with a template in the spatial domain for a 3D detailed small scale urban environment reconstruction. The intelligent reconstruction system is designed to recreate the whole model based on specific features of objects for large scale environment reconstruction. This study then proposes a new flood simulation scheme which is an important application of the 3D environmental reconstruction system. Two new flooding models have been developed. The first one is flood spreading model which is useful for large scale flood simulation. It consists of flooding image spatial segmentation, a water level calculation process, a standard gradient descent method for energy minimization, a flood region search and a merge process. The finite volume hydrodynamic model is built from shallow water equations which is useful for urban area flood simulation. The proposed 3D urban environment reconstruction system was tested on our simulation platform. The experiment results indicate that this method is capable of dealing with complicated and high resolution region reconstruction which is useful for many applications. When testing the 3D flood simulation system, the simulation results are very close to the real flood situation, and this method has faster speed and greater accuracy of simulating the inundation area in comparison to the conventional flood simulation models.
GIS Applications for Water, Wastewater, and Stormwater Systems U.M. Shamsi 2005-01-27 Professionals involved in the planning, design, operation, and construction of water, wastewater, and stormwater systems need to understand the productivity-enhancing applications of GIS. Inspired by an ASCE-sponsored continuing education course taught by the author, GIS Applications for Water, Wastewater, and Stormwater Systems focuses on the practical aspects of software and data tools that enable GIS applications. The book documents and analyzes effective use of GIS, demonstrating how you can apply the technology to make tasks easier to perform, saving time and money for your organization. The book first describes GIS, detailing its importance and explaining how to avoid potential pitfalls via a needs analysis study. It then describes GIS-related technologies that are crucial in applications development: remote sensing; DEM data; GPS; Internet applications; and mobile GIS. The final ten chapters focus on the "Four Ms" of the water industry–Mapping, Monitoring, Modeling, and Maintenance–applications that define the most important activities for efficient management of water, wastewater, and stormwater systems. Promoting a performance- (or outcome-) based style of learning, each chapter first states learning objectives and later concludes with a chapter summary and questions. The text encourages more effective and natural inductive study by first presenting case studies, then explaining procedures. This volume supplements the text with numerous maps, tables, and illustrations.
Digital Terrain Analysis in Soil Science and Geology Igor Florinsky 2016-07-11 Digital Terrain Analysis in Soil Science and Geology, Second Edition, synthesizes the knowledge on methods and applications of digital terrain analysis and geomorphometry in the context of multi-scale problems in soil science and geology. Divided into three parts, the book first examines main concepts, principles, and methods of digital terrain modeling. It then looks at methods for analysis, modeling, and mapping of spatial distribution of soil properties using digital terrain analysis, before finally considering techniques for recognition, analysis, and interpretation of topographically manifested geological features. Digital Terrain Analysis in Soil Science and Geology, Second Edition, is an updated and revised edition, providing both a theoretical and methodological basis for understanding and applying geographical modeling techniques. Presents an integrated and unified view of digital terrain analysis in both soil science and geology Features research on new advances in the field, including DEM analytical approximation, analytical calculation of local morphometric variables, morphometric globes, and two-dimensional generalized spectral analytical methods Includes a rigorous description of the mathematical principles of digital terrain analysis Provides both a theoretical and methodological basis for understanding and applying geographical modeling
Grome Terrain Modeling with Ogre3D, UDK, and Unity3D Richard A. Hawley 2013-01-01 This book is a practical guide with examples and clear steps to explain terrain modeling with Grome.If you're a developer or artist looking for a guide to walk you through GROME 3.1, then this book is for you. This book will help you from the first step to exporting a terrain as a workable art asset in a game engine
Highway Progress United States. Bureau of Public Roads 1947
Review of the Latest Developments Relating Policies and Management of National Mapping and Charting Programmes Finland 1992
Scientific and Technical Aerospace Reports 1994 Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.
Companion to European Heritage Revivals Linde Egberts 2014-07-24 Are you organising an international heritage project? Turning a so-called 'heritage revival' into a meaningful experience for the general public can be a challenge to historians, archaeologists, museum conservators and tourism professionals alike. This Companion to European Heritage Revivals offers inspiration and new ideas to those who want to engage a large, international audience in activities which bring the past to life. It offers a critical examination of the field’s basic concepts and discusses a vast array of 'heritage revival tools', including games, historical re-enactments, 3D-visualisations, films, television documentaries, spatial designs and most importantly, international heritage routes. Through many case studies, this book demonstrates how various aspects of heritage can be effectively presented by linking historical places and landscapes in a single revival to create a multifaceted but coherent whole. Above all, it shows the exceptional success achieved by projects which consistently focus on creating meaningful experiences together with individual users.
Terrain Modelling in Surveying and Civil Engineering G. Petrie 1990 Examines current developments in terrain modelling and its application to civil engineering design, land and hydrographic surveying, development planning and computer visualization for civil and military applications.
Surface Models for Geosciences Kateřina Růžičková 2015-05-27 The aim of the conference is to present and discuss new methods, issues and challenges encountered in all parts of the complex process of gradual development and application of digital surface models. This process covers data capture, data generation, storage, model creation, validation, manipulation, utilization and visualization. Each stage requires suitable methods and involves issues that may substantially decrease the value of the model. Furthermore, the conference provides a platform to discuss the requirements, features and research approaches for 3D modeling, continuous field modeling and other geoscience applications. The conference covers the following topics: - LIDAR for elevation data - Radar interferometry for elevation data - Surface model creation - Surface model statistics - Surface model storage (including data formats, standardization, database) - Feature extraction - Analysis of surface models - Surface models for hydrology, meteorology, climatology - Surface models for signal spreading - Surface models for geology (structural, mining) - Surface models for environmental science - Surface models for visibility studies - Surface models for urban geography - Surface models for human geography - Uncertainty of surface models and digital terrain analysis - Surface model visual enhancement and rendering
Marine Geomorphometry Vanessa Lucieer 2019-06-25 Geomorphometry is the science of quantitative terrain characterization and analysis, and has traditionally focused on the investigation of terrestrial and planetary landscapes. However, applications of marine geomorphometry have now moved beyond the simple adoption of techniques developed for terrestrial studies, driven by the rise in the acquisition of high-resolution seafloor data and by the availability of user-friendly spatial analytical tools. Considering that the seafloor represents 71% of the surface of our planet, this is an important step towards understanding the Earth in its entirety. This volume is the first one dedicated to marine applications of geomorphometry. It showcases studies addressing the five steps of geomorphometry: sampling a surface (e.g., the seafloor), generating a Digital Terrain Model (DTM) from samples, preprocessing the DTM for subsequent analyses (e.g., correcting for errors and artifacts), deriving terrain attributes and/or extracting terrain features from the DTM, and using and explaining those terrain attributes and features in a given context. Throughout these studies, authors address a range of challenges and issues associated with applying geomorphometric techniques to the complex marine environment, including issues related to spatial scale, data quality, and linking seafloor topography with physical, geological, biological, and ecological processes. As marine geomorphometry becomes increasingly recognized as a sub-discipline of geomorphometry, this volume brings together a collection of research articles that reflect the types of studies that are helping to chart the course for the future of marine geomorphometry.
Report - U.S. Bureau of Public Roads United States. Bureau of Public Roads 1957
Innovations In GIS Zarine Kemp 2003-09-02 Derived from presentations made at the fourth annual UK National Conference on GIS Research, this work consists of contributions by leading experts in: geography, mathematics, computing science, surveying, archaeology, planning and medicine.
ICT Innovations 2013 Vladimir Trajkovik 2013-07-20 Information communication technologies have become the necessity in everyday life enabling increased level of communication, processing and information exchange to extent that one could not imagine only a decade ago. Innovations in these technologies open new fields in areas such as: language processing, biology, medicine, robotics, security, urban planning, networking, governance and many others. The applications of these innovations are used to define services that not only ease, but also increase the quality of life. Good education is essential for establishing solid basis of individual development and performance. ICT is integrated part of education at every level and type. Therefore, the special focus should be given to possible deployment of the novel technologies in order to achieve educational paradigms adapted to possible educational consumer specific and individual needs. This book offers a collection of papers presented at the Fifth International Conference on ICT Innovations held in September 2013, in Ohrid, Macedonia. The conference gathered academics, professionals and practitioners in developing solutions and systems in the industrial and business arena especially innovative commercial implementations, novel applications of technology, and experience in applying recent ICT research advances to practical solutions.
Geomorphological Mapping Mike J. Smith 2011-10-22 Geomorphological Mapping: a professional handbook of techniques and applications is a new book targeted at academics and practitioners who use, or wish to utilise, geomorphological mapping within their work. Synthesising for the first time an historical perspective to geomorphological mapping, field based and digital tools and techniques for mapping and an extensive array of case studies from academics and professionals active in the area. Those active in geomorphology, engineering geology, reinsurance, Environmental Impact Assessors, and allied areas, will find the text of immense value. Growth of interest in geomorphological mapping and currently no texts comprehensively cover this topic Extensive case studies that will appeal to professionals, academics and students (with extensive use of diagrams, potentially colour plates) Brings together material on digital mapping (GIS and remote sensing), cartography and data sources with a focus on modern technologies (including GIS, remote sensing and digital terrain analysis) Provides readers with summaries of current advances in methodological/technical aspects Accompanied by electronic resources for digital mapping
Digital Terrain Modelling Robert Joseph Peckham 2007-10-12 This publication is the first book on the development and application of digital terrain modeling for regional planning and policy support. It is a compilation of research results by international research groups at the European Commission’s Joint Research Centre, providing scientific support to the development and implementation of EU environmental policy. This practice-oriented book is recommended reading for practising environmental modelers and GIS experts working on regional planning and policy support applications.
Proceedings of the Digital Terrain Models (DTM) Symposium 1978
Laser Scanning for the Environmental Sciences George Heritage 2009-05-06 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 this 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 revieved papers presented at the 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 technical and applied 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.
Inside Risk: A Strategy for Sustainable Risk Mitigation Scira Menoni 2011-05-17 This book comprises the main results of the Scenario (Support on Common European Strategy for sustainable natural and induced technological hazards mitigation) project, funded as a Specific Support Action under the VI FP. This book addresses three main needs: first, it constitutes an assessment of the situation of Europe as far as natural na-tech risks are considered; second, it suggests future research themes to be opened of widened so as to tackle new and emerging threats as well as changes in the potential response to risk governance, in order to improve the way scientific and technical expertise informs decision making regarding all fields of mitigation, ranging from structural to non structural measures, such as training, education and land use planning.