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Spatial Modeling and Assessment of Urban Form CRC Press

A wide range of methodologies for the production and analysis of urban remote sensing data are outlined in this book. To begin with, a number of techniques are examined for the extraction of information which can be applied to

digital, multispectral images of urban areas. These include improvements to conventional per-pixel image classification algorithms, various methods of image fusion, the application of syntactic pattern recognition techniques, the role of mathematical morphology, and geostatistical approaches to the analysis and interpretation of image textural and spatial patterns. The bo.

Radar Remote Sensing of Urban Areas LAP Lambert Academic Publishing

An authoritative guide to the essential techniques and most recent advances in urban remote sensing Techniques

and Methods in Urban Remote Sensing offers a comprehensive guide to the recent theories, methods, techniques, and applications in urban remote sensing. Written by a noted expert on the subject, this book explores the requirements for mapping impervious surfaces and examines the issue of scale. The book covers a range of topics and includes illustrative examples of commonly used methods for estimating and mapping urban impervious surfaces, explains how to determine urban thermal landscape and surface energy balance, and offers information on impacts of urbanization on land surface temperature, water quality, and environmental health.

Techniques and Methods in Urban Remote Sensing brings together in one volume the latest opportunities for combining ever-increasing computational power, more plentiful and capable data, and more advanced algorithms. This allows the technologies of remote sensing and GIS to become mature and to gain wider and better applications in environments, ecosystems, resources, geosciences, geography and urban studies. This important book: Contains a comprehensive resource to the latest developments in urban remote sensing Explains urban heat islands modeling and analysis Includes information on estimating urban surface energy fluxes Offers a guide to generating data on land surface temperature Written for professionals and students of environmental, ecological, civic and urban studies, Techniques and Methods in Urban Remote Sensing meets the demand for an updated resource that addresses the recent advances urban remote sensing.

Remote Sensing and Urban Analysis CRC

Press

This book introduces remotely sensed image processing for urban areas using optical and synthetic aperture radar (SAR) data and assists students, researchers, and remote sensing practitioners who are interested in land cover mapping using such data. There are many introductory and advanced books on optical and SAR remote sensing image processing, but most of them do not serve as good practical guides. However, this book is designed as a practical guide and a hands-on workbook, where users can explore data and methods to improve their land cover mapping skills for urban areas. Although there are many freely available earth observation data, the focus is on land cover mapping using Sentinel-1 C-band SAR and Sentinel-2 data. All remotely sensed image processing and classification procedures are based on open-source software applications such as QGIS and R as well as cloud-based platforms such as Google Earth Engine (GEE). The book is organized into six chapters. Chapter 1 introduces geospatial machine learning, and Chapter 2 covers exploratory image analysis and transformation. Chapters 3 and 4 focus on mapping urban land cover using multi-seasonal Sentinel-2 imagery and multi-seasonal Sentinel-1 imagery, respectively. Chapter 5 discusses mapping

urban land cover using multi-seasonal Sentinel-1 and Sentinel-2 imagery as well as other derived data such as spectral and texture indices. Chapter 6 concludes the book with land cover classification accuracy assessment. *Urban High-Resolution Remote Sensing* Springer

Urban Remote Sensing The second edition of Urban Remote Sensing is a state-of-the-art review of the latest progress in the subject. The text examines how evolving innovations in remote sensing allow to deliver the critical information on cities in a timely and cost-effective way to support various urban management activities and the scientific research on urban morphology, socio-environmental dynamics, and sustainability. Chapters are written by leading scholars from a variety of disciplines including remote sensing, GIS, geography, urban planning, environmental science, and sustainability science, with case studies predominately drawn from North America and Europe. A review of

the essential and emerging research areas in urban remote sensing including sensors, techniques, and applications, especially some critical issues that are shifting the - directions in urban remote sensing research. Illustrated in full color throughout, including numerous relevant case studies and extensive discussions of important concepts and cutting-edge technologies to enable clearer understanding for non-technical audiences. Urban Remote Sensing, Second Edition will be of particular interest to upper-division undergraduate and graduate students, researchers and professionals working in the fields of remote sensing, geospatial information, and urban & environmental planning.

The Application of Remote Sensing Techniques to Inter and Intra Urban Analysis CRC Press

High spatial resolution remote sensing is an area of considerable current interest and builds on developments in object-based image analysis, commercial high-resolution satellite sensors, and UAVs. It captures more details through high and

very high resolution images (10 to 100 cm/pixel). This unprecedented level of detail offers the potential extraction of a range of multi-resource management information, such as precision farming, invasive and endangered vegetative species delineation, forest gap sizes and distribution, locations of highly valued habitats, or sub-canopy topographic information. Information extracted in high spatial remote sensing data right after a devastating earthquake can help assess the damage to roads and buildings and aid in emergency planning for contact and evacuation. To effectively utilize information contained in high spatial resolution imagery, High Spatial Resolution Remote Sensing: Data, Analysis, and Applications addresses some key questions: What are the challenges of using new sensors and new platforms? What are the cutting-edge methods for fine-level information extraction from high spatial resolution images? How can high spatial resolution data improve the quantification and characterization of physical-environmental or human patterns and processes? The answers are built in three separate parts: (1) data acquisition and preprocessing, (2) algorithms and techniques, and (3) case studies and applications. They discuss the opportunities and challenges of using new sensors and platforms and high spatial resolution remote sensing data and recent developments with a focus on UAVs. This work addresses the issues related to high spatial image processing and introduces cutting-edge methods, summarizes state-of-the-art high spatial resolution applications, and demonstrates how high

spatial resolution remote sensing can support the extraction of detailed information needed in different systems. Using various high spatial resolution data, the third part of this book covers a range of unique applications, from grasslands to wetlands, karst areas, and cherry orchard trees.

Techniques and Methods in Urban Remote Sensing John Wiley & Sons

With urbanization as a global phenomenon, there is a need for data and information about these terrains. Urban remote sensing techniques provide critical physical input and intelligence for preparing base maps, formulating planning proposals, and monitoring implementations. Likewise these methodologies help with understanding the biophysical properties, patterns, and process of urban landscapes, as well as mapping and monitoring urban land cover and spatial extent. Advanced sensor technologies and image processing methodologies such as deep learning, data mining, etc., facilitate the wide applications of remote sensing technology in urban areas. This book presents advanced image processing methods and algorithms focused on three very important roots of urban remote sensing: 3D urban modelling using different remotely sensed data, urban orthophotomap generation, and urban feature extraction, which are also today 's real

challenges in high resolution remote sensing. Data generated by remote sensing, with its repetitive and synoptic viewing and multispectral capabilities, constitutes a powerful tool for mapping and monitoring emerging changes in the city's urban core, as well as in peripheral areas. Features: Provides advances in emerging methods and algorithms in image processing and technology Uses algorithms and methodologies for handling high-resolution imagery from a ground sampling distance (GSD) less than 1.0 meter Focuses on 3D urban modelling, orthorectification methodologies, and urban feature extraction algorithms from high-resolution remotely sensed imagery Demonstrates how to apply up-to-date techniques to the problems identified and how to analyze research results Presents methods and algorithms for monitoring, analyzing, and modeling urban growth, urban planning, and socio-economic developments In this book, readers are provided with valuable research studies and applications-oriented chapters in areas such as urban trees, soil moisture mapping, city transportation, urban remote sensing big data, etc.

Geographic Information Research CRC Press

Remote Sensing and Urban Analysis CRC Press

The Operational Use of Remote Sensing in Municipalities John Wiley & Sons

This report serves as a practical guide to show how satellite remote sensing can be a useful source of urban management information and to demonstrate the benefits of geographical analysis of available data. It focuses on operational applications in cities in developing countries, based on a comprehensive review of recent reports and illustrated by experience from case studies and operational projects. It offers an introduction to the technologies, available range of products, and various methods of analysis offered by satellite remote sensing. (Adapt é du r é sum é de l'auteur).

Remote Sensing and Urban Analysis Springer
This book discusses the application of Geospatial data, Geographic Information System (GIS) and Remote Sensing (RS) technologies in analysis and modeling of urban growth process, and its pattern, with special focus on sprawl and compact form of urban development. The book explains these two kinds of urban forms (sprawl and compact urban development) in detail regarding their advantages, disadvantages, indicators, assessment, modeling, implementation and their relationship with urban sustainability. It confirms that the proposed modeling approaches, geospatial data and GIS are

very practical for identifying urban growth, land use change patterns and their general trends in future. The analyses and modeling approaches presented in this book can be employed to guide the identification and measurements of the changes and growth likely to happen in urban areas. In addition, this book can be helpful for town planning and development in order to design urban areas in a compact form and eventually sustainable manner.

Urban Applications of Satellite Remote Sensing and GIS Analysis CRC Press

This book documents research conducted on the analysis of urban growth and sprawl by using remote sensing data and GIS techniques. The research was conducted between 1980-2010 in the city of Kolkata, India. The aim of the research was to use metrics that were less demanding in terms of data and computation than normal metrics.

However, it has been found that most of them were inferior in capturing insights of urban sprawl. For this book, some of these metrics have therefore been modified and new ones are proposed. The research focuses on problems associated with the analysis of urban growth by using remote sensing data from a technological perspective.

Encyclopedia of Natural Resources - Land - Volume I CRC Press

"Remote Sensing of Urban and Suburban Areas" provides instructors with a text reference that has a logical and easy-to-follow flow of topics around which they can structure

the syllabi of their urban remote sensing courses. Topics have been chosen to bridge the gap between remote sensing and urban studies through a better understanding of the science that underlies both fields. In so doing, the book includes 17 chapters written by leading international experts in respected fields to provide a balanced coverage of fundamental issues in both remote sensing and urban studies. Emphasis is placed on: theoretical and practical issues in contemporary urban studies and remote sensing; the spectral, spatial and temporal requirements of remotely sensed data in relation to various urban phenomena; methods and techniques for analyzing and integrating remotely sensed data and image processing with geographic information systems to address urban problems; and examples of applications in which applying remote sensing to tackle urban problems is deemed useful and important.

Remote Sensing Image Analysis: Including the Spatial Domain Springer Science & Business Media

This evaluation of the potential of remote sensing of urban areas helps to close a gap between the research-focused results offered by the "urban remote sensing" community, and the application of these data and products by the governing bodies of cities and urban

regions. The authors present data from six urban regions worldwide. They explain what the important questions are, and how data and scientific skills can help answer them.

Urban Remote Sensing Remote Sensing and Urban Analysis

Today, remote sensing technology is an essential tool for understanding the Earth and managing human-Earth interactions. There is a rapidly growing need for remote sensing and Earth observation technology that enables monitoring of world ' s natural resources and environments, managing exposure to natural and man-made risks and more frequently occurring disasters, and helping the sustainability and productivity of natural and human ecosystems. The improvement in temporal resolution/ revisit allows for the large accumulation of images for a specific location, creating a possibility for time series image analysis and eventual real-time assessments of scene dynamics. As an authoritative text, Remote Sensing Time Series Image Processing brings together active and recognized authors in the field of time series image analysis and presents to the readers the current state of knowledge

and its future directions. Divided into three parts, the first addresses methods and techniques for generating time series image datasets. In particular, it provides guidance on the selection of cloud and cloud shadow detection algorithms for various applications. Part II examines feature development and information extraction methods for time series imagery. It presents some key remote sensing-based metrics, and their major applications in ecosystems and climate change studies. Part III illustrates various applications of time series image processing in land cover change, disturbance attribution, vegetation dynamics, and urbanization. This book is intended for researchers, practitioners, and students in both remote sensing and imaging science. It can be used as a textbook by undergraduate and graduate students majoring in remote sensing, imaging science, civil and electrical engineering, geography, geosciences, planning, environmental science, land use, energy, and GIS, and as a reference book by practitioners and professionals in the government, commercial, and industrial sectors.

Urban Remote Sensing GRIN Verlag

Includes proceedings that cover 84 papers, presented at the 'Remote Sensing for a Changing Europe' symposium held in Istanbul, Turkey (2-5 June 2008).

Geospatial Techniques in Urban Hazard and Disaster Analysis Springer Science & Business Media

An authoritative guide to the essential techniques and most recent advances in urban remote sensing Techniques and Methods in Urban Remote Sensing offers a comprehensive guide to the recent theories, methods, techniques, and applications in urban remote sensing. Written by a noted expert on the subject, this book explores the requirements for mapping impervious surfaces and examines the issue of scale.

The book covers a range of topics and includes illustrative examples of commonly used methods for estimating and mapping urban impervious surfaces, explains how to determine urban thermal landscape and surface energy balance, and offers information on impacts of urbanization on land surface temperature, water quality, and environmental health. Techniques and Methods in Urban Remote Sensing brings

together in one volume the latest opportunities for combining ever-increasing computational power, more plentiful and capable data, and more advanced algorithms. This allows the technologies of remote sensing and GIS to become mature and to gain wider and better applications in environments, ecosystems, resources, geosciences, geography and urban studies.

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Urban Spatial Structure Analysis Springer Nature

Driven by advances in technology and societal needs, the next frontier in remote sensing is urban areas. With the advent of

high-resolution imagery and more capable techniques, the question has become "Now that we have the technology, how do we use it?" The need for a definitive resource that explores the technology of remote sensing and the issues it can resolve in an urban setting has never been more acute.

Containing contributions from world renowned experts, Urban Remote Sensing provides a review of basic concepts, methodologies, and case studies. Each chapter demonstrates how to apply up-to-date techniques to the problems identified and how to analyze research results.

Organized into five sections, this book: Focuses on data, sensors, and systems considerations as well as algorithms for urban feature extraction Analyzes urban landscapes in terms of composition and structure, especially using sub-pixel analysis techniques Presents methods for monitoring, analyzing, and modeling urban growth Illustrates various approaches to urban planning and socio-economic applications of urban remote sensing Assesses the progress made to date, identifies the existing problems and challenges, and demonstrates new

developments and trends in urban remote sensing. This book is ideal for upper division undergraduate and graduate students, however it can also serve as a reference for researchers or those individuals interested in the remote sensing of cities in academia, and governmental and commercial sectors. Urban Remote Sensing examines how to apply remote sensing technology to urban and suburban areas.

Remote Sensing and Urban Analysis Springer Science & Business Media

Academic Paper from the year 2021 in the subject Geography / Earth Science - Regional Geography, grade: 100%, , language: English, abstract: This research aimed at analysing and quantifying urban growth pattern of Urban-West in Zanzibar using Remote Sensing, GIS and Spatial Metrics. To achieve this goal various data were used such as Landsat images, Sentinel 2A image and Building data have been utilized. Urbanization is a phenomenon that is of major concern in both developing and developed countries.

According to the census record between 1988 and 2002 there was a near-doubling of the urbanized population in Urban-West of region Zanzibar Island and continued high growth since 2002 are unprecedented in intensity,

scope and impacts on the lands, particular in Urban-West. Such rapid urbanization of West district has meant that the city has doubled in areal extent. Currently there is lack of timely and quantitative information of the urban growth and its long-term impacts, thus planners haven't been able to assess and analyse consistently growth of Urban-West in Zanzibar. Keywords: GIS, Land cover, Remote sensing, spatial, Urban growth

Optical and SAR Remote Sensing of Urban Areas CRC Press

Uncontrolled rapid urban growth due to built-up area expansion over the last few decades has created critical problems to urban planners. Therefore, it is worth to identify spatial distribution pattern of built-up area in a town. Remote Sensing (RS) and Geographical Information System (GIS) provide a great potential for urban data collection & spatial analysis and not much academic literature exists on how to best utilize these technologies for urban studies. Traditional approaches to data collection and analysis no longer adequate to provide updated information for urban planners. This book, therefore, introduces alternative techniques for data collection, updating, detection of built-up area change and unauthorised constructions, identifying urban spatial distribution pattern considering built-up area density. New GIS spatial analysis techniques such as weighted mean centre and spatial autocorrelation tools introduced. These

analysis techniques should help to shed light on the field of urban planning, and should be especially useful to students and professionals in urban planning or anyone else who may be considering utilizing RS and GIS for urban spatial structure analysis.

Applied Remote Sensing for Urban Planning, Governance and Sustainability John Wiley & Sons. This book is the second in a series that examines how geographic information technologies (GIT) are being implemented to improve our understanding of a variety of hazard and disaster situations. The main types of technologies covered under the umbrella of GIT, as used in this volume, are geographic information systems, remote sensing (not including ground-penetrating or underwater systems), and global positioning systems. Our focus is on urban areas, broadly defined in order to encompass rapidly growing and densely populated areas that may not be considered "urban" in the conventional sense. The material presented here is also unabashedly applied — our goal is to provide GIT tools to those seeking more efficient ways to respond to, recover from, mitigate, prevent, and/or model hazard and disaster events in urban settings. Therefore, this book was created not only with our colleagues in the academic world in mind, but also for hazards professionals and practitioners. We also believe graduate students will find the material presented here of interest, as may upper division undergraduate students.

Urban Remote Sensing Springer Science &

Business Media

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