Spatial Databases A Tour

This book focuses on the modeling and management of spatial data in distributed systems. The authors have structured the contributions from internationally renowned researchers into four parts. The book offers researchers an excellent overview of the state-of-the-art in modeling and management of spatial data in distributed environments, while it may also be the basis of specialized courses on Web-based geographical information systems.

Spatial Databases: Technologies, Techniques and Trends introduces the reader to the world of spatial databases, and related subtopics. The broad range of topics covered within the chapters includes spatial data modeling, indexing of spatial and spatiotemporal objects, data mining and knowledge discovery in spatial and spatiotemporal management issues and query processing for moving objects. The reader will be able to get in touch with several important research issues the research community is dealing with today. Covering fundamental aspects up to advanced material, Spatial Databases: Technologies, Techniques and Trends appeals to a broad computer science audience. Although perfect for specialists, each chapter is self contained, making it easy for non-specialists to grasp the main issues involved.

With the increased use of technology in modern society, high volumes of multimedia information exists. It is important for businesses, organizations, and individuals to understand how to optimize this data and new methods are emerging for more efficient information management and retrieval. Information Retrieval and Management: Concepts, Methodologies, Tools, and Applications is an innovative reference source for the latest academic material in the field of information and

communication technologies and explores how complex information systems interact with and affect one another. Highlighting a range of topics such as knowledge discovery, semantic web, and information resources management, this multi-volume book is ideally designed for researchers, developers, managers, strategic planners, and advanced-level students.

Microsoft SQL Server implements extensive support for location-based data. Pro Spatial with SQL Server 2012 introduces SQL Server's spatial feature set, and covers everything you'll need to know to store, manipulate, and analyze information about the physical location of objects in space. You'll learn about the geography and geometry datatypes, and how to apply them in practical situations involving the spatial relationships of people, places, and things on Earth. Author Alastair Aitchison first introduces you to SQL Server's spatial feature set and the fundamental concepts involved in working with spatial data, including spatial references and co-ordinate systems. You'll learn to query, analyze, and interpret spatial data using tools such as Bing Maps and SQL Server Reporting Services. Throughout, you'll find helpful code examples that you can adopt and extend as a basis for your own projects. Explains spatial concepts from the ground up—no prior knowledge is necessary Provides comprehensive guidance for every stage of working with spatial data, from importing through cleansing and storing, to querying, and finally for retrieval and display of spatial data in an application layer Brilliantly illustrated with code examples that run in SQL Server 2012, that you can adapt and use as the basis for your own projects.

Computerized crime mapping or GIS in law enforcement agencies has experienced rapid growth, particularly since the mid 1990s. There has also been increasing interests in GIS analysis of crime from various academic fields including

criminology, geography, urban planning, information science and others. This book features a diverse array of GIS applications in crime analysis, from general issues such as GIS as a communication process and inter-jurisdictional data sharing to specific applications in tracking serial killers and predicting juvenile violence. Geographic Information Systems and Crime Analysis showcases a broad range of methods and techniques from typical GIS tasks such as geocoding and hotspot analysis to advanced technologies such as geographic profiling, agent-based modeling and web GIS. Contributors range from university professors, criminologists in research institutes to police chiefs, GIS analysts in police departments and consultants in criminal justice.

The Definitive Volume on Cutting-Edge Exploratory Analysis of Massive Spatial and Spatiotemporal DatabasesSince the publication of the first edition of Geographic Data Mining and Knowledge Discovery, new techniques for geographic data warehousing (GDW), spatial data mining, and geovisualization (GVis) have been developed. In addition, there has bee

The proper management of geographic data can provide assistance to a number of different sectors within society. As such, it is imperative to continue advancing research for spatial data analysis. The Handbook of Research on Geographic Information Systems Applications and Advancements presents a thorough overview of the latest developments in effective management techniques for collecting, processing, analyzing, and utilizing geographical data and information. Highlighting theoretical frameworks and relevant applications, this book is an ideal reference source for researchers, academics, professionals, and students actively involved in the field of geographic information systems.

The book addresses the problem of accuracy of spatial

databases, and comprises of papers drawn from a wide range of physical and human systems, taking approaches which vary from statistical to descriptive. Together they present both a comprehensive review of existing knowledge, techniques and experience, and an analysis of critical research needs in this area of spatial data handling.

Leading international scholars are brought together to present readers with an exploration into the full diversity of the field of spatial media including technologies, spatial data, and consequences

Environmental information systems (EIS) are concerned with the management of data about the soil, the water, the air, and the species in the world around us. This first textbook on the topic gives a conceptual framework for EIS by structuring the data flow into 4 phases: data capture, storage, analysis, and metadata management. This flow corresponds to a complex aggregation process gradually transforming the incoming raw data into concise documents suitable for high-level decision support. All relevant concepts are covered, including statistical classification, data fusion, uncertainty management, knowledge based systems, GIS, spatial databases, multidimensional access methods, object-oriented databases, simulation models, and Internet-based information management. Several case studies present EIS in practice.

An accessible guide to the ideas and technologies underlying such applications as GPS, Google Maps, Pokémon Go, ride-sharing, driverless cars, and drone surveillance. Billions of people around the globe use various applications of spatial computing daily—by using a ride-sharing app, GPS, the e911 system, social media check-ins, even Pokémon Go. Scientists and researchers use spatial computing to track diseases, map the bottom of the oceans, chart the behavior of endangered species, and create election maps in real time. Drones and driverless cars use a variety of spatial computing

technologies. Spatial computing works by understanding the physical world, knowing and communicating our relation to places in that world, and navigating through those places. It has changed our lives and infrastructures profoundly, marking a significant shift in how we make our way in the world. This volume in the MIT Essential Knowledge series explains the technologies and ideas behind spatial computing. The book offers accessible descriptions of GPS and location-based services, including the use of Wi-Fi, Bluetooth, and RFID for position determination out of satellite range; remote sensing, which uses satellite and aerial platforms to monitor such varied phenomena as global food production, the effects of climate change, and subsurface natural resources on other planets; geographic information systems (GIS), which store, analyze, and visualize spatial data; spatial databases, which store multiple forms of spatial data; and spatial statistics and spatial data science, used to analyze location-related data. · This book is an updated version of a well-received book previously published in Chinese by Science Press of China (the first edition in 2006 and the second in 2013). It offers a systematic and practical overview of spatial data mining, which combines computer science and geo-spatial information science, allowing each field to profit from the knowledge and techniques of the other. To address the spatiotemporal specialties of spatial data, the authors introduce the key concepts and algorithms of the data field, cloud model, mining view, and Deren Li methods. The data field method captures the interactions between spatial objects by diffusing the data contribution from a universe of samples to a universe of population, thereby bridging the gap between the data model and the recognition model. The cloud model is a qualitative method that utilizes quantitative numerical characters to bridge the gap between pure data and linguistic concepts. The mining view method discriminates the different

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

This book constitutes the refereed proceedings of the 6th International Symposium on Spatial Databases, SSD'99, held in Hong Kong, China in July 1999. The 17 revised full papers presented were carefully selected from 55 submissions. Also included are short papers corresponding to three invited talks and industrial applications presentations. The papers are organized in chapters on multi-resolution and scale, indexing, moving objects and spatio-temporal data, spatial mining and classification, spatial join, uncertainty and geological hypermaps, and industrial and visionary application track.

"Addresses the evolution of database management, technologies and applications along with the progress and endeavors of new research areas."--P. xiii.

Authoritative and comprehensive, this is the leading text and professional resource on using geographic information systems (GIS) to analyze and address public health problems. Basic GIS concepts and tools are explained, including ways to access and manage spatial databases. The book presents state-of-the-art methods for mapping and analyzing data on population, health events, risk factors, and health services, and for incorporating geographical

knowledge into planning and policy. Numerous maps, diagrams, and real-world applications are featured. The companion Web page provides lab exercises with data that can be downloaded for individual or course use. New to This Edition *Incorporates major technological advances, such as Internet-based mapping systems and the rise of data from cell phones and other GPS-enabled devices. *Chapter on health disparities. *Expanded coverage of public participation GIS. *Companion Web page has all-new content. *Goes beyond the United States to encompass an international focus. First uniform treatment of moving objects databases, the technology that supports GPS and RFID data analysis. Create and manage spatial data with PostGIS Key Features Import and export geographic data from the PostGIS database using the available tools Maintain, optimize, and fine-tune spatial data for long-term viability Utilize the parallel support functionality that was introduced in PostgreSQL 9.6 Book Description PostGIS is a spatial database that integrates the advanced storage and analysis of vector and raster data, and is remarkably flexible and powerful. PostGIS provides support for geographic objects to the PostgreSQL object-relational database and is currently the most popular open source spatial databases. If you want to explore the complete range of PostGIS techniques and expose related extensions, then this book is for you. This book is a comprehensive guide to PostGIS tools and concepts which are required to manage, manipulate, and analyze spatial data in PostGIS. It covers key spatial

data manipulation tasks, explaining not only how each task is performed, but also why. It provides practical guidance allowing you to safely take advantage of the advanced technology in PostGIS in order to simplify your spatial database administration tasks. Furthermore, you will learn to take advantage of basic and advanced vector, raster, and routing approaches along with the concepts of data maintenance, optimization, and performance, and will help you to integrate these into a large ecosystem of desktop and web tools. By the end, you will be armed with all the tools and instructions you need to both manage the spatial database system and make better decisions as your project's requirements evolve. What you will learn Import and export geographic data from the PostGIS database using the available tools Structure spatial data using the functionality provided by a combination of PostgreSQL and PostGIS Work with a set of PostGIS functions to perform basic and advanced vector analyses Connect PostGIS with Python Learn to use programming frameworks around PostGIS Maintain, optimize, and fine-tune spatial data for long-term viability Explore the 3D capabilities of PostGIS, including LiDAR point clouds and point clouds derived from Structure from Motion (SfM) techniques Distribute 3D models through the Web using the X3D standard Use PostGIS to develop powerful GIS web applications using Open Geospatial Consortium

web standards Master PostGIS Raster Who this book is for This book is for developers who need some quick solutions for PostGIS. Prior knowledge of PostgreSQL and spatial concepts would be an added advantage.

As research in the geosciences and social sciences becomes increasingly dependent on computers, applications such as geographical information systems are becoming indispensable tools. But the digital representations of phenomena that these systems require are often of poor quality, leading to inaccurate results, uncertainty, error propagation, and

Summary PostGIS in Action, Second Edition teaches readers of all levels to write spatial queries that solve real-world problems. It first gives you a background in vector-, raster-, and topology-based GIS and then quickly moves into analyzing, viewing, and mapping data. This second edition covers PostGIS 2.0 and 2.1 series, PostgreSQL 9.1, 9.2, and 9.3 features, and shows you how to integrate with other GIS tools. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Book Processing data tied to location and topology requires specialized know-how. PostGIS is a free spatial database extender for PostgreSQL, every bit as good as proprietary software. With it, you can easily create location-aware queries in just a few lines of SQL code and

build the back end for a mapping, raster analysis, or routing application with minimal effort. PostGIS in Action, Second Edition teaches you to solve real-world geodata problems. It first gives you a background in vector-, raster-, and topology-based GIS and then quickly moves into analyzing, viewing, and mapping data. You'll learn how to optimize queries for maximum speed, simplify geometries for greater efficiency, and create custom functions for your own applications. You'll also learn how to apply your existing GIS knowledge to PostGIS and integrate with other GIS tools. Familiarity with relational database and GIS concepts is helpful but not required. What's Inside An introduction to spatial databases Geometry, geography, raster, and topology spatial types, functions, and queries Applying PostGIS to real-world problems Extending PostGIS to web and desktop applications Updated for PostGIS 2.x and PostgreSQL 9.x About the Authors Regina Obe and Leo Hsu are database consultants and authors. Regina is a member of the PostGIS core development team and the Project Steering Committee. Table of Contents PART 1 INTRODUCTION TO POSTGIS What is a spatial database? Spatial data types Spatial reference system considerations Working with real data Using PostGIS on the desktop Geometry and geography functions Raster functions PostGIS TIGER geocoder Geometry relationships PART 2 PUTTING POSTGIS

TO WORK Proximity analysis Geometry and geography processing Raster processing Building and using topologies Organizing spatial data Query performance tuning PART 3 USING POSTGIS WITH OTHER TOOLS Extending PostGIS with pgRouting and procedural languages Using PostGIS in web applications

The Third International Symposium on Large Spatial Databases (SSD '93) was held at the National University of Singapore in June 1993. The previous meetings of the series were at Sanata Barbara (1989) and Zurich (1991). The meetings are planned as a forum for researchers and practitioners specializing in database theory for and advanced applications of Spatial Information Systems. This volume constitutes the proceedings of the symposium. It contains 25 selected papersand three keynotes papers: "Spatial data management in database systems: research directions" (W. Kim), "From extensible databases to interoperability between multiple databases and GIS applications" (H.-J. Schek), and "The SEQUOIA 2000 project" (M. Stonebraker). The selectedpapers are collected into sections on: data modeling, spatial indexing, indexing mechanisms, handling of raster and vector data, spatial database systems, topology, storage management, query retrieval,knowledge engineering in SDS, and 3-dimensional data handling. Introduces the reader to the world of spatial

databases, and related subtopics. The broad range of topics includes spatial data modelling, indexing of spatial and spatiotemporal objects, data mining and knowledge discovery in spatial and spatiotemporal management issues and query processing for moving objects.

"This book presents probable solutions when discovering the spatial sequence patterns by incorporating the information into the sequence of patterns, and introduces new classes of spatial sequence patterns, called flow and generalized spatio-temporal patterns, addressing different scenarios in spatio-temporal data by modeling them as graphs, providing a comprehensive synopsis on two successful partition-based algorithms designed by the authors"--Provided by publisher.

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

The authors explore and explain current techniques for handling the specialised data that describes geographical phenomena in a study that will be of great value to computer scientists and geographers working with spatial databases.

Across numerous industries in modern society, there is a constant need to gather precise and relevant data efficiently and quickly. As such, it is imperative to research new methods and approaches to increase productivity in these areas. Ontologies and Big Data Considerations for Effective Intelligence is a key source on the latest advancements in multidisciplinary research methods and applications and examines effective techniques for managing and utilizing information resources. Featuring extensive coverage across a range of relevant perspectives and topics, such as visual analytics, spatial databases, retrieval systems, and ontology

models, this book is ideally designed for researchers, graduate students, academics, and industry professionals seeking ways to optimize knowledge management processes. Spatial DatabasesA TourPearson

This book places spatial data within the broader domain of information technology (IT) while providing a comprehensive and coherent explanation of the guiding principles, methods, implementation and operational management of spatial databases within the workplace. The text explains the key concepts, issues and processes of spatial data implementation and provides a holistic management perspective.

PostGIS in Action, Third Edition shows you how to solve real-world geodata problems. You'll go beyond basic mapping, and explore custom functions for your applications. Summary In PostGIS in Action, Third Edition you will learn: An introduction to spatial databases Geometry, geography, raster, and topology spatial types, functions, and queries Applying PostGIS to real-world problems Extending PostGIS to web and desktop applications Querying data from external sources using PostgreSQL Foreign Data Wrappers Optimizing queries for maximum speed Simplifying geometries for greater efficiency PostGIS in Action, Third Edition teaches readers of all levels to write spatial queries for PostgreSQL. You'll start by exploring vector-, raster-, and topology-based GIS before quickly progressing to analyzing, viewing, and mapping data. This fully updated third edition covers key changes in PostGIS 3.1 and PostgreSQL 13, including parallelization support, partitioned tables, and new JSON functions that help in creating web mapping applications. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology PostGIS is a spatial database extender for PostgreSQL. It offers the features and

firepower you need to take on nearly any geodata task. PostGIS lets you create location-aware queries with a few lines of SQL code, then build the backend for mapping, raster analysis, or routing application with minimal effort. About the book PostGIS in Action, Third Edition shows you how to solve real-world geodata problems. You'll go beyond basic mapping, and explore custom functions for your applications. Inside this fully updated edition, you'll find coverage of new PostGIS features such as PostGIS Window functions, parallelization of queries, and outputting data for applications using JSON and Vector Tile functions. What's inside Fully revised for PostGIS version 3.1 and PostgreSQL 13 Optimize queries for maximum speed Simplify geometries for greater efficiency Extend PostGIS to web and desktop applications About the reader For readers familiar with relational databases and basic SQL. No prior geodata or GIS experience required. About the author Regina Obe and Leo Hsu are database consultants and authors. Regina is a member of the PostGIS core development team and the Project Steering Committee. Table of Contents PART 1 INTRODUCTION TO POSTGIS 1 What is a spatial database? 2 Spatial data types 3 Spatial reference systems 4 Working with real data 5 Using PostGIS on the desktop 6 Geometry and geography functions 7 Raster functions 8 Spatial relationships PART 2 PUTTING POSTGIS TO WORK 9 Proximity analysis 10 PostGIS TIGER geocoder 11 Geometry and geography processing 12 Raster processing 13 Building and using topologies 14 Organizing spatial data 15 Query performance tuning PART 3 USING POSTGIS WITH OTHER TOOLS 16 Extending PostGIS with pgRouting and procedural languages 17 Using PostGIS in web applications

In this volume the contributors use Geographical Information Systems (GIS) to reassess both historic and contemporary

Asian countries and traditionally Islamic areas. This highly illustrated and comprehensive work highlights how GIS can be applied to the social sciences. With its description of how to process, construct and manage geographical data the book is ideal for the non-specialist looking for a new and refreshing way to approach Islamic area studies.

This text aims to provide students with the basics in the applications and methods of spatial database management systems. It balances theory (cutting-edge research) and practice (commercial trends).

The availability of spatial databases and widespread use of geographic information systems has stimulated increasing interest in the analysis and modelling of spatial data. Spatial data analysis focuses on detecting patterns, and on exploring and modelling relationships between them in order to understand the processes responsible for their emergence. In this way, the role of space is emphasised , and our understanding of the working and representation of space, spatial patterns, and processes is enhanced. In applied research, the recognition of the spatial dimension often yields different and more meaningful results and helps to avoid erroneous conclusions. This book aims to provide an introduction into spatial data analysis to graduates interested in applied statistical research. The text has been structured from a data-driven rather than a theory-based perspective, and focuses on those models, methods and techniques which are both accessible and of practical use for graduate students. Exploratory techniques as well as more formal model-based approaches are presented, and both area data and origin-destination flow data are considered.

Geographical Information Systems (GIS) and related spatial technologies have a new and powerful role to play in archaeological interpretation. Beginning with a conceptual approach to the representation of space adopted by GIS, this

book examines spatial databases; the acquisition and compilation of data; the analytical compilation of data; the analytical functionality of GIS; and the creation and utilization of critical foundation data layers such as the Digital Elevation Model (DEM). The ways in which GIS can most usefully facilitate archaeological analysis and interpretation are then explored particularly as a tool for the management of archaeological resources. Formal analysis of archaeological material, and the use of trend surface, contouring and interpolation procedures are considered along with predictive modeling analysis of visibility and intervisibility. Finally there is a discussion of leading-edge issues, including three-dimensional GIS, object-oriented GIS, the relationship between GIS and 'Virtual Reality' technologies, and the integration of GIS with distributed systems and the Internet. The approach is light, and technical detail is kept to a minimum, recognizing that most readers are simply interested in using GIS effectively. The text is carefully illustrated with worked case-studies using archaeological data. Spatial Technology and Archaeology provides a single reference source for archaeologists, students, professionals, and academics in archaeology as well as those in anthropology and related disciplines.

Open access to information of geographic places and spatial relationships provides an essential part of the analytical processing of spatial data. Access to connected geospatial programs allows for improvement in teaching and understanding science, technology, engineering, and mathematics. Emerging Trends in Open Source Geographic Information Systems provides emerging research on the applications of free and open software in

geographic information systems in various fields of study. While highlighting topics such as data warehousing, hydrological modeling, and software packages, this publication explores the assessment and techniques of open software functionality and interfaces. This book is an important resource for professionals, researchers, academicians, and students seeking current research on the different types and uses of data and data analysis in geographic information systems.

This book constitutes the refereed proceedings of the 28th Australasian Database Conference, ADC 2017, held in Brisbane, QLD, Australia, in September 2017. The 20 full papers presented together with 2 demo papers were carefully reviewed and selected from 32 submissions. The mission of ADC is to share novel research solutions to problems of today's information society that fulfill the needs of heterogeneous applications and environments and to identify new issues and directions for future research and development work. The topics of the presented papers are related to all practical and theoretical aspects of advanced database theory and applications, as well as case studies and implementation experiences.

This book represents five and a half years of work by the ICA Commission on Standards for the Transfer of Spatial Data during the 1991- 95 ICA cycle. The effort began with the Commission working to develop

a set of scientific characteristics by which every kind of spatial data transfer standard could be understood and assessed. This implies that every facet of the transfer process must be understood so that the scientific characteristics could be most efficiently specified. The members of the Commission spent hours looking at their own standard and many others, to ascertain how to specify most effectively the characteristic or subcharacteristic in question. The result is a set of internationally agreed scientific characteristics with 13 broad primary level classes of characteristics, 85 secondary characteristics, and about 220 tertiary characteristics that recognizes almost every possible capability that a spatial data transfer standard might have. It is recognized that no one standard possesses all of these characteristics, but contains a subset of these characteristics. However, these characteristics have been specified in such a way to facilitate understanding of individual standards, and use by interested parties of making comparisons for their own purposes. Although individual applications of a standard may be for different purposes, this set of characteristics provides a uniform measure by which the various standards may be assessed. The book presents an Introduction and four general chapters that describe the spatial data transfer standards activities happening in Europe, North America, Asia/Pacific, and the ISO community. This provides the context so

the reader can more easily understand the scientific and technical framework from which a particular standard has come. The third section is a complete listing of all of the three levels of characteristics and their meaning by the inclusion of a set of definitions for terms used in the book. The fourth section, and by far the largest, contains 22 chapters that assess each of the major national and international spatial data transfer standards in the world in terms of all three levels of characteristics. Each assessment has been done by a Commission member who has been an active participant in the development of the standard being assessed in the native language of that standard. A cross-table chart is also provided. "This book discusses the complete range of contemporary research topics such as computer modeling, geometry, geoprocessing, and geographic information systems"--Provided by publisher. Geocomputation with R is for people who want to analyze, visualize and model geographic data with open source software. It is based on R, a statistical programming language that has powerful data processing, visualization, and geospatial capabilities. The book equips you with the knowledge and skills to tackle a wide range of issues manifested in geographic data, including those with scientific, societal, and environmental implications. This book will interest people from many backgrounds, especially Geographic Information Systems (GIS)

users interested in applying their domain-specific knowledge in a powerful open source language for data science, and R users interested in extending their skills to handle spatial data. The book is divided into three parts: (I) Foundations, aimed at getting you up-to-speed with geographic data in R, (II) extensions, which covers advanced techniques, and (III) applications to real-world problems. The chapters cover progressively more advanced topics, with early chapters providing strong foundations on which the later chapters build. Part I describes the nature of spatial datasets in R and methods for manipulating them. It also covers geographic data import/export and transforming coordinate reference systems. Part II represents methods that build on these foundations. It covers advanced map making (including web mapping), "bridges" to GIS, sharing reproducible code, and how to do cross-validation in the presence of spatial autocorrelation. Part III applies the knowledge gained to tackle real-world problems, including representing and modeling transport systems, finding optimal locations for stores or services, and ecological modeling. Exercises at the end of each chapter give you the skills needed to tackle a range of geospatial problems. Solutions for each chapter and supplementary materials providing extended examples are available at https://geocompr.github.io/geocompkg/articles/. Dr.

Robin Lovelace is a University Academic Fellow at the University of Leeds, where he has taught R for geographic research over many years, with a focus on transport systems. Dr. Jakub Nowosad is an Assistant Professor in the Department of Geoinformation at the Adam Mickiewicz University in Poznan, where his focus is on the analysis of large datasets to understand environmental processes. Dr. Jannes Muenchow is a Postdoctoral Researcher in the GIScience Department at the University of Jena, where he develops and teaches a range of geographic methods, with a focus on ecological modeling, statistical geocomputing, and predictive mapping. All three are active developers and work on a number of R packages, including stplanr, sabre, and RQGIS.

This volume constitutes the refereed proceedings of the 11th International Symposium on Spatial and Temporal Databases, SSTD 2009, held in Aalborg, Denmark, in July 2009. The 20 revised full papers presented together with 3 keynotes, 7 short papers, and 10 demonstration papers, were thoroughly reviewed and selected from a total of 62 research submissions and 11 demonstration submissions. The papers are organized in topical sections on spatial and flow networks, integrity and security, uncertain data and new technologies, indexing and monitoring moving objects, advanced queries, as well as on models and languages.

This book guides animal ecologists, biologists and wildlife and data managers through a step-by-step procedure to build their own advanced software platforms to manage and process wildlife tracking data. This unique, problem-solving-oriented guide focuses on how to extract the most from GPS animal tracking data, while preventing error propagation and optimizing analysis performance. Based on the open source PostgreSQL/PostGIS spatial database, the software platform will allow researchers and managers to integrate and harmonize GPS tracking data together with animal characteristics, environmental data sets, including remote sensing image time series, and other bio-logged data, such as acceleration data. Moreover, the book shows how the powerful R statistical environment can be integrated into the software platform, either connecting the database with R, or embedding the same tools in the database through the PostgreSQL extension Pl/R. The client/server architecture allows users to remotely connect a number of software applications that can be used as a database front end, including GIS software and WebGIS. Each chapter offers a real-world data management and processing problem that is discussed in its biological context; solutions are proposed and exemplified through ad hoc SQL code, progressively exploring the potential of spatial database functions applied to the respective wildlife tracking case. Finally, wildlife

tracking management issues are discussed in the increasingly widespread framework of collaborative science and data sharing. GPS animal telemetry data from a real study, freely available online, are used to demonstrate the proposed examples. This book is also suitable for undergraduate and graduate students, if accompanied by the basics of databases. Copyright: 9eb005190d44f4a8bbc8198e70345a29