

Python For Geospatial Data Analysis

Geographical Data Science and Spatial Data Analysis Explainable Machine Learning for Geospatial Data Analysis Spatial Data Analysis An Introduction to Spatial Data Analysis Geospatial Data Analytics on AWS Spatial Data Analysis Geospatial Analysis Spatial Data Analysis With R Geospatial Analysis with SQL Python for Geospatial Data Analysis Learning R for Geospatial Analysis Quantitative Geography Learning Geospatial Analysis with Python Explainable Machine Learning for Geospatial Data Analysis Geospatial Data Analytics and Urban Applications Geospatial Data Science Techniques and Applications Advanced Techniques in Geospatial Data Analysis and Mapping with Python Geospatial Data Science Quick Start Guide Open Source Geospatial Tools ArcPy and ArcGIS – Geospatial Analysis with Python *Lex Comber Courage Kamusoko Christopher Lloyd Martin Wegmann Scott Bateman Robert P. Haining Michael John De Smith Danlin Yu Bonny P McClain Bonny P. McClain Michael Dorman A Stewart Fotheringham Joel Lawhead Courage Kamusoko Sandeep Narayan Kundu Hassan A. Karimi Edward Franklin Abdishakur Hassan Daniel McNerney Silas Toms*

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this book builds on the previous book by the same authors an introduction to r for spatial analysis and mapping to consider spatial data ie the location attached to data issues of inference linking big data geography gis mapping and spatial analytics a learning by doing text book it covers important theoretical issues and helps to develop practical skills in the reader for addressing these

explainable machine learning xml a subfield of ai is focused on making complex ai models understandable to humans this book highlights and explains the details of machine learning models used in geospatial data analysis it demonstrates the need for a data centric explainable machine learning approach to obtain new insights from geospatial data it presents the opportunities challenges and gaps in the machine and deep learning approaches for geospatial data analysis and how they are applied to solve various environmental problems in land cover changes and in modeling forest canopy height and aboveground biomass density the author also includes guidelines and code scripts r python valuable for practical readers features data centric explainable machine learning ml approaches for geospatial data analysis the foundations and approaches to explainable ml and deep learning several case studies from urban land cover and forestry where existing explainable machine learning methods are applied descriptions of the opportunities challenges and gaps in data centric explainable ml approaches for geospatial data analysis scripts in r and python to perform geospatial data analysis available upon request this book is an essential resource for graduate students researchers and academics working in and studying data science and machine learning as well as geospatial data science professionals using gis and remote sensing in environmental fields

spatial data analysis introduces key principles about spatial data and provides guidance on methods for their exploration it provides a set of key ideas or frameworks that will give the reader knowledge of the kinds of problems that can be tackled using the tools that are widely available for the analysis of spatial data

this is a book about how ecologists can integrate remote sensing and gis in their research it will allow readers to get started with the application of remote sensing and to understand its potential and limitations using practical examples the book covers all necessary steps from planning field campaigns to deriving ecologically relevant information through remote sensing and modelling of species distributions an introduction to spatial data analysis introduces spatial data handling using the open source software quantum gis qgis in addition readers will be guided through their first steps in the r programming language the authors explain the fundamentals of spatial data handling and analysis empowering the reader to turn data acquired in the field into actual spatial data readers will learn to process and analyse spatial data of different

types and interpret the data and results after finishing this book readers will be able to address questions such as what is the distance to the border of the protected area which points are located close to a road which fraction of land cover types exist in my study area using different software and techniques this book is for novice spatial data users and does not assume any prior knowledge of spatial data itself or practical experience working with such data sets readers will likely include student and professional ecologists geographers and any environmental scientists or practitioners who need to collect visualize and analyse spatial data the software used is the widely applied open source scientific programs qgis and r all scripts and data sets used in the book will be provided online at book.ecosens.org this book covers specific methods including what to consider before collecting in situ data how to work with spatial data collected in situ the difference between raster and vector data how to acquire further vector and raster data how to create relevant environmental information how to combine and analyse in situ and remote sensing data how to create useful maps for field work and presentations how to use qgis and r for spatial analysis how to develop analysis scripts

build an end to end geospatial data lake in aws using popular aws services such as rds redshift dynamodb and athena to manage geodata purchase of the print or kindle book includes a free pdf ebook key features explore the architecture and different use cases to build and manage geospatial data lakes in aws discover how to leverage aws purpose built databases to store and analyze geospatial data learn how to recognize which anti patterns to avoid when managing geospatial data in the cloud book descriptionmanaging geospatial data and building location based applications in the cloud can be a daunting task this comprehensive guide helps you overcome this challenge by presenting the concept of working with geospatial data in the cloud in an easy to understand way along with teaching you how to design and build data lake architecture in aws for geospatial data you ll begin by exploring the use of aws databases like redshift and aurora postgresql for storing and analyzing geospatial data next you ll leverage services such as dynamodb and athena which offer powerful built in geospatial functions for indexing and querying geospatial data the book is filled with practical examples to illustrate the benefits of managing geospatial data in the cloud as you advance you ll discover how to analyze and visualize data using python and r and utilize quicksight to share derived insights the concluding chapters explore the integration of commonly used platforms like open data on aws openstreetmap and arcgis with aws to enable you to optimize efficiency and provide a supportive community for continuous learning by the end of this book you ll have the necessary tools and expertise to build and manage your own geospatial data lake on aws along with the knowledge needed to tackle geospatial data management challenges and make the most of aws services what you will learn discover how to optimize the cloud to store your geospatial data explore management strategies for your data repository using aws

single sign on and iam create effective sql queries against your geospatial data using athena validate postal addresses using amazon location services process structured and unstructured geospatial data efficiently using r use amazon sagemaker to enable machine learning features in your application explore the free and subscription satellite imagery data available for use in your gis who this book is for if you understand the importance of accurate coordinates but not necessarily the cloud then this book is for you this book is best suited for gis developers gis analysts data analysts and data scientists looking to enhance their solutions with geospatial data for cloud centric applications a basic understanding of geographic concepts is suggested but no experience with the cloud is necessary for understanding the concepts in this book

spatial data analysis theory and practice first published in 2003 provides a broad ranging treatment of the field of spatial data analysis it begins with an overview of spatial data analysis and the importance of location place context and space in scientific and policy related research covering fundamental problems concerning how attributes in geographical space are represented to the latest methods of exploratory spatial data analysis and spatial modeling it is designed to take the reader through the key areas that underpin the analysis of spatial data providing a platform from which to view and critically appreciate many of the key areas of the field parts of the text are accessible to undergraduate and master s level students but it also contains sufficient challenging material that it will be of interest to geographers social and economic scientists environmental scientists and statisticians whose research takes them into the area of spatial analysis

addresses a range of analytical techniques that are provided within modern geographic information systems and related geospatial software products this guide covers the principal concepts of geospatial analysis core components of geospatial analysis and surface analysis including surface form analysis gridding and interpolation methods

this is an introduction for social science students to the growing field of spatial data analysis using the r platform the text assumes no prior knowledge of either beyond the contents of an introductory statistics course it uses the open source software r and relevant spatial data analysis packages to provide practical guidance of how to conduct spatial data analysis with readers own data sets the book first briefly introduces students to r covers some basic concepts in statistical data analysis and then focuses on discussing the central ideas of spatial data analysis all the discussions are supported with r scripts so that students can work on their own and produce results that the book helps interpret each chapter ends with review questions to test understanding the book is suited for upper level undergraduate social science students and graduate students and other social scientists who are interested in analyzing their spatial data with r a companion website for the book at edge.sagepub.com/you includes r code and

data for students to replicate the examples in the book the password protected instructor side of the site includes exercises and answers which can be set for homework

leverage the power of sql to perform geospatial analysis and increase your speed and efficiency working with a variety of spatial applications such as postgis and qgis key features follow along with actionable instructions with this practical guide become well versed in advanced spatial modeling and machine learning techniques learn best practices for performing spatial analysis from an expert spatial data analyst book description geospatial analysis is industry agnostic and a powerful tool for answering location questions combined with the power of sql developers and analysts worldwide rely on database integration to solve real world spatial problems this book introduces skills to help you detect and quantify patterns in datasets through data exploration visualization data engineering and the application of analysis and spatial techniques you will begin by exploring the fundamentals of geospatial analysis where you ll learn about the importance of geospatial analysis and how location information enhances data exploration walter tobler s second law of geography states the phenomenon external to a geographic area of interest affects what goes on inside this quote will be the framework of the geospatial questions we will explore you ll then observe the framework of geospatial analysis using sql while learning to create spatial databases and sql queries and functions by the end of this book you will have an expanded toolbox of analytic skills such as postgis and qgis to explore data questions and analysis of spatial information what you will learn understand geospatial fundamentals as a basis for learning spatial sql generate point line and polygon data with sql use spatial data types to abstract and encapsulate spatial structures work with open source gis combined with plug ins visualize spatial data and expand qgis functionality with postgres apply location data to leverage spatial analytics perform single layer and multiple layer spatial analyses who this book is for this book is for anyone looking to leverage their sql knowledge to perform geospatial analysis gis analysts data analysts and data scientists with a basic understanding of both geospatial analysis and sql will find this book useful

in spatial data science things in closer proximity to one another likely have more in common than things that are farther apart with this practical book geospatial professionals data scientists business analysts geographers geologists and others familiar with data analysis and visualization will learn the fundamentals of spatial data analysis to gain a deeper understanding of their data questions author bonny p mcclain demonstrates why detecting and quantifying patterns in geospatial data is vital both proprietary and open source platforms allow you to process and visualize spatial information this book is for people familiar with data analysis or visualization who are eager to explore geospatial integration with python this book helps you understand the importance of applying spatial relationships in data science select and apply data

layering of both raster and vector graphics apply location data to leverage spatial analytics design informative and accurate maps automate geographic data with python scripts explore python packages for additional functionality work with atypical data types such as polygons shape files and projections understand the graphical syntax of spatial data science to stimulate curiosity

this book is intended for anyone who wants to learn how to efficiently analyze geospatial data with r including gis analysts researchers educators and students who work with spatial data and who are interested in expanding their capabilities through programming the book assumes familiarity with the basic geographic information concepts such as spatial coordinates but no prior experience with r and or programming is required by focusing on r exclusively you will not need to depend on any external software a working installation of r is all that is necessary to begin

integrating a discussion of the application of quantitative methods with practical examples this book explains the philosophy of the new quantitative methodologies and contrasts them with the methods associated with geography s quantitative revolution of the 1960s key issues discussed include the nature of modern quantitative geography spatial data geographical information systems visualization local analysis point pattern analysis spatial regression and statistical inference concluding with a review of models used in spatial theory the authors discuss the current challenges to spatial data analysis written to be accessible to communicate the diversity and excitement of recent thinking quantitative geog

this is a tutorial style book that helps you to perform geospatial and gis analysis with python and its tools libraries this book will first introduce various python related tools packages in the initial chapters before moving towards practical usage examples and implementation in specialized kinds of geospatial data analysis this book is for anyone who wants to understand digital mapping and analysis and who uses python or another scripting language for automation or crunching data manually this book primarily targets python developers researchers and analysts who want to perform geospatial modeling and gis analysis with python

explainable machine learning xml a subfield of ai is focused on making complex ai models understandable to humans this book highlights and explains the details of machine learning models used in geospatial data analysis it demonstrates the need for a data centric explainable machine learning approach to obtain new insights from geospatial data it presents the opportunities challenges and gaps in the machine and deep learning approaches for geospatial data analysis and how they are applied to

solve various environmental problems in land cover changes and in modeling forest canopy height and aboveground biomass density the author also includes guidelines and code scripts in python valuable for practical readers features data centric explainable machine learning ml approaches for geospatial data analysis the foundations and approaches to explainable ml and deep learning several case studies from urban land cover and forestry where existing explainable machine learning methods are applied descriptions of the opportunities challenges and gaps in data centric explainable ml approaches for geospatial data analysis scripts in python to perform geospatial data analysis available upon request this book is an essential resource for graduate students researchers and academics working in and studying data science and machine learning as well as geospatial data science professionals using gis and remote sensing in environmental fields

this book highlights advanced applications of geospatial data analytics to address real world issues in urban society with a connected world we are generating spatial data at unprecedented rates which can be harnessed for insightful analytics which define the way we analyze past events and define the future directions this book is an anthology of applications of spatial data and analytics performed on them for gaining insights which can be used for problem solving in an urban setting each chapter is contributed by spatially aware data scientists in the making who present spatial perspectives drawn on spatial big data the book shall benefit mature researchers and student alike to discourse a variety of urban applications which display the use of machine learning algorithms on spatial big data for real world problem solving

data science has recently gained much attention for a number of reasons and among them is big data scientists from almost all disciplines including physics chemistry biology sociology among others and engineers from all fields including civil environmental chemical mechanical among others are faced with challenges posed by data volume variety and velocity or big data this book is designed to highlight the unique characteristics of geospatial data demonstrate the need to different approaches and techniques for obtaining new knowledge from raw geospatial data and present select state of the art geospatial data science techniques and how they are applied to various geoscience problems

this book focuses on the use of open source software for geospatial analysis it demonstrates the effectiveness of the command line interface for handling both vector raster and 3d geospatial data appropriate open source tools for data processing are clearly explained and discusses how they can be used to solve everyday tasks a series of fully worked case studies are presented including vector spatial analysis remote sensing data analysis landcover classification and lidar processing a hands on introduction

to the application programming interface api of gdal ogr in python c is provided for readers who want to extend existing tools and or develop their own software

if you are a gis student or professional who needs an understanding of how to use arcpy to reduce repetitive tasks and perform analysis faster this book is for you it is also a valuable book for python programmers who want to understand how to automate geospatial analyses

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