

A Primer For Spatial Econometrics With Applications In R Author Giuseppe Arbia Published On June 2014

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Basketball Data Science - Paola Zuccolotto 2020-01-03

Using data from one season of NBA games, **Basketball Data Science: With Applications in R** is the perfect book for anyone interested in learning and applying data analytics in basketball. Whether assessing the spatial performance of an NBA player's shots or doing an analysis of the impact of high pressure game situations on the probability of scoring, this book discusses a variety of case studies and hands-on examples using a custom R package. The codes are supplied so readers can reproduce the analyses themselves or create their own. Assuming a basic statistical knowledge, **Basketball Data Science with R** is suitable for students, technicians, coaches, data analysts and applied researchers. Features: · One of the first books to provide statistical and data mining methods for the growing field of analytics in basketball. · Presents tools for modelling graphs and figures to visualize the data. · Includes real world case studies and examples, such as estimations of scoring probability using the Golden State Warriors as a test case. · Provides the source code and data so readers can do their own analyses on NBA teams and players.

Applied Financial Econometrics - Moinak Maiti 2021-08-31

This textbook gives students an approachable, down to earth resource for the study of financial econometrics. While the subject can be intimidating, primarily due to the mathematics and modelling involved, it is rewarding for students of finance and can be taught and learned in a straightforward way. This book, going from basics to high level concepts, offers knowledge of econometrics that is intended to be used with confidence in the real world. This book will be beneficial for both students and tutors who are associated with econometrics subjects at any level.

Spatial Econometric Methods in Agricultural Economics Using R -

Paolo Postiglione 2021-12-23

Modern tools, such as GIS and remote sensing, are increasingly used in the monitoring of agricultural resources. The developments in GIS technology offer growing opportunities to agricultural economics analysts dealing with large and detailed spatial databases, allowing them to combine spatial information from different sources and to produce different models. The availability of these valuable sources of information makes the advanced models suggested in the spatial statistic and econometric literature applicable to agricultural economics. This book aims at supporting stakeholders to design spatial surveys for agricultural data and/or to analyse the geographically collected data. This book attempts to describe the main typology of agricultural data and the most appropriate methods for the analysis, together with a detailed description of the available data sources and their collection methods. Topics such as spatial interpolation, point patterns, spatial autocorrelation, survey data analysis, small area estimation, regional data modelling, and spatial econometrics techniques are covered jointly with issues arising from the integration of several data types. The theory of spatial methods is complemented by real and/or simulated examples implemented through the open-source software R.

Microeconometrics - A. Colin Cameron 2005-05-09

This book provides the most comprehensive treatment to date of microeconometrics, the analysis of individual-level data on the economic behavior of individuals or firms using regression methods for cross section and panel data. The book is oriented to the practitioner. A basic understanding of the linear regression model with matrix algebra is assumed. The text can be used for a microeconometrics course, typically a second-year economics PhD course; for data-oriented applied microeconometrics field courses; and as a reference work for graduate students and applied researchers who wish to fill in gaps in their toolkit.

Distinguishing features of the book include emphasis on nonlinear models and robust inference, simulation-based estimation, and problems of complex survey data. The book makes frequent use of numerical examples based on generated data to illustrate the key models and methods. More substantially, it systematically integrates into the text empirical illustrations based on seven large and exceptionally rich data sets.

Regression Modelling with Spatial and Spatial-Temporal Data -

Robert P. Haining 2020-01-27

Modelling Spatial and Spatial-Temporal Data: A Bayesian Approach is aimed at statisticians and quantitative social, economic and public health students and researchers who work with spatial and spatial-temporal data. It assumes a grounding in statistical theory up to the standard linear regression model. The book compares both hierarchical and spatial econometric modelling, providing both a reference and a teaching text with exercises in each chapter. The book provides a fully Bayesian, self-contained, treatment of the underlying statistical theory, with chapters dedicated to substantive applications. The book includes WinBUGS code and R code and all datasets are available online. Part I covers fundamental issues arising when modelling spatial and spatial-temporal data. Part II focuses on modelling cross-sectional spatial data and begins by describing exploratory methods that help guide the modelling process. There are then two theoretical chapters on Bayesian models and a chapter of applications. Two chapters follow on spatial econometric modelling, one describing different models, the other substantive applications. Part III discusses modelling spatial-temporal data, first introducing models for time series data. Exploratory methods for detecting different types of space-time interaction are presented followed by two chapters on the theory of space-time separable (without space-time interaction) and inseparable (with space-time interaction) models. An applications chapter includes: the evaluation of a policy intervention; analysing the temporal dynamics of crime hotspots; chronic disease surveillance; and testing for evidence of spatial spillovers in the spread of an infectious disease. A final chapter suggests some future directions and challenges.

Introduction to Spatial Econometrics - James LeSage 2009-01-20

Although interest in spatial regression models has surged in recent years, a comprehensive, up-to-date text on these approaches does not exist. Filling this void, **Introduction to Spatial Econometrics** presents a variety of regression methods used to analyze spatial data samples that violate the traditional assumption of independence between observations. It explores a wide range of alternative topics, including maximum likelihood and Bayesian estimation, various types of spatial regression specifications, and applied modeling situations involving different circumstances. Leaders in this field, the authors clarify the often-mystifying phenomenon of simultaneous spatial dependence. By presenting new methods, they help with the interpretation of spatial regression models, especially ones that include spatial lags of the dependent variable. The authors also examine the relationship between spatiotemporal processes and long-run equilibrium states that are characterized by simultaneous spatial dependence. MATLAB® toolboxes useful for spatial econometric estimation are available on the authors' websites. This work covers spatial econometric modeling as well as numerous applied illustrations of the methods. It encompasses many recent advances in spatial econometric models—including some previously unpublished results.

Spatial Econometric Interaction Modelling - Roberto Patuelli 2016-07-25

This contributed volume applies spatial and space-time econometric methods to spatial interaction modeling. The first part of the book

addresses general cutting-edge methodological questions in spatial econometric interaction modeling, which concern aspects such as coefficient interpretation, constrained estimation, and scale effects. The second part deals with technical solutions to particular estimation issues, such as intraregional flows, Bayesian PPML and VAR estimation. The final part presents a number of empirical applications, ranging from interregional tourism competition and domestic trade to space-time migration modeling and residential relocation.

Practical Handbook of Spatial Statistics - Sandra Arlinghaus
2020-08-27

The guidance and special techniques provided in this handbook will allow you to understand and use complex spatial statistical techniques. You will learn how to apply proper spatial analysis techniques and why they are generally different from conventional statistical analyses. Clear and concise information on weighting, aggregation effects, sampling, spatial statistics and GIS, and visualization of spatial dependence is provided. Discussions on specific applications using actual data sets fill obvious gaps in the literature, and coverage of critical research frontiers allows readers to explore current areas of active research.

Artificial Intelligence in Urban Planning and Design - Imdat As
2022-05-27

Artificial Intelligence in Urban Planning and Design: Technologies, Implementation, and Impacts is the most comprehensive resource available on the state of Artificial Intelligence (AI) as it relates to smart city planning and urban design. The book explains nascent applications of AI technologies in urban design and city planning, providing a thorough overview of AI-based solutions. It offers a framework for discussion of theoretical foundations of AI, AI applications in the urban design, AI-based research and information systems, and AI-based generative design systems. The concept of AI generates unprecedented city planning solutions without defined rules in advance, a development raising important questions issues for urban design and city planning. This book articulates current theoretical and practical methods, offering critical views on tools and techniques and suggests future directions for the meaningful use of AI technology. Includes a cutting-edge catalogue of AI tools applied to smart city design and planning Provides case studies from around the globe at various scales Includes diagrams and graphics for course instruction

Spatial Econometrics - Harry Kelejian 2017-07-20

Spatial Econometrics provides a modern, powerful and flexible skillset to early career researchers interested in entering this rapidly expanding discipline. It articulates the principles and current practice of modern spatial econometrics and spatial statistics, combining rigorous depth of presentation with unusual depth of coverage. Introducing and formalizing the principles of, and 'need' for, models which define spatial interactions, the book provides a comprehensive framework for almost every major facet of modern science. Subjects covered at length include spatial regression models, weighting matrices, estimation procedures and the complications associated with their use. The work particularly focuses on models of uncertainty and estimation under various complications relating to model specifications, data problems, tests of hypotheses, along with systems and panel data extensions which are covered in exhaustive detail. Extensions discussing pre-test procedures and Bayesian methodologies are provided at length. Throughout, direct applications of spatial models are described in detail, with copious illustrative empirical examples demonstrating how readers might implement spatial analysis in research projects. Designed as a textbook and reference companion, every chapter concludes with a set of questions for formal or self-study. Finally, the book includes extensive supplementing information in a large sample theory in the R programming language that supports early career econometricians interested in the implementation of statistical procedures covered. Combines advanced theoretical foundations with cutting-edge computational developments in R Builds from solid foundations, to more sophisticated extensions that are intended to jumpstart research careers in spatial econometrics Written by two of the most accomplished and extensively published econometricians working in the discipline Describes fundamental principles intuitively, but without sacrificing rigor Provides empirical illustrations for many spatial methods across diverse field Emphasizes a modern treatment of the field using the generalized method of moments (GMM) approach Explores sophisticated modern research methodologies, including pre-test procedures and Bayesian data analysis

A Primer on Efficiency Measurement for Utilities and Transport Regulators - Tim Coelli 2003

Annotation Options and guidelines for measuring the efficiency of recently privatized utilities (electricity, gas, water, sewerage, telecommunications, airports, ports, rail).

Rural-Urban Dichotomies and Spatial Development in Asia - Amitrajeet A. Batabyal 2021-07-01

This edited book brings together in one place new studies of rural-urban interactions and their implications for regional growth and development in different regions within Asia. Specifically, the individual chapters in the book shed light on the different kinds of rural-urban interactions that we witness in Asian regions, particularly those that are based on migration, poverty, inequality, education, economic dependence, and the flow of goods and services. The book departs from the existing literature in three ways. First, it explicitly recognizes that different kinds of rural-urban interactions have dissimilar impacts on the lives and hence on the welfare of the residents of rural and urban regions. Second, the book emphasizes the varied spatial and temporal dimensions of the interactions and the ways in which these dimensions influence rural and urban societies. Third, this book demonstrates the ways in which an understanding of the preceding two points contributes to our knowledge about economic growth and development. Because Asia is the fastest-growing and most dynamic continent in the world today, the research delineated in the individual chapters of the book provides practical guidance concerning two salient questions. First, how do we effectively address the economic development challenges stemming from the interactions between alternate rural and urban regions within Asia? Second, how do we ensure that the policies we design to address these challenges give rise to broad-based economic growth and development that is sustainable?

Spatial Econometrics - Giuseppe Arbia 2006-06-08

This book bridges the gap between economic theory and spatial econometric techniques. It is accessible to those with only a basic statistical background and no prior knowledge of spatial econometric methods. It provides a comprehensive treatment of the topic, motivating the reader with examples and analysis. The volume provides a rigorous treatment of the basic spatial linear model, and it discusses the violations of the classical regression assumptions that occur when dealing with spatial data.

The Economy as a Complex Spatial System - Pasquale Commendatore 2017-09-18

This book is open access under a CC BY-NC 4.0 license. This collected volume represents the final outcome of the COST Action IS1104 "The EU in the new complex geography of economic systems: models, tools and policy evaluation". Visualizing the EU as a complex and multi-layered network, the book is organized in three parts, each of them dealing with a different level of analysis: At the macro-level, Part I considers the interactions within large economic systems (regions or countries) involving trade, workers migration, and other factor movements. At the meso-level, Part II discusses interactions within specific but wide-ranging markets, with a focus on financial markets and banking systems. Lastly, at the micro-level, Part III explores the decision-making of single firms, especially in the context of location decisions.

Handbook of Spatial Analysis in the Social Sciences - Sergio J. Rey
2022-11-18

Providing an authoritative assessment of the current landscape of spatial analysis in the social sciences, this cutting-edge Handbook covers the full range of standard and emerging methods across the social science domain areas in which these methods are typically applied. Accessible and comprehensive, it expertly answers the key questions regarding the dynamic intersection of spatial analysis and the social sciences.

European Regional Growth - Bernard Fingleton 2013-06-29

European Regional Growth is the result of three major influences. First, the ongoing integration of the European regional economies and the need to understand what this means for European economic and social cohesion. Second, the development of geo-economic theories. Third, the development of techniques of spatial data analysis, simulation, data visualization and spatial econometrics. The outcome is a collection of chapters that apply these methods, motivated by a variety of theoretical positions. The book provides powerful and detailed analyses of the causes of income, productivity and employment variations across Europe's regions, and insights into their future prospects.

A Primer for Spatial Econometrics - G. Arbia 2014-06-30

This book aims at meeting the growing demand in the field by introducing the basic spatial econometrics methodologies to a wide variety of researchers. It provides a practical guide that illustrates the potential of spatial econometric modelling, discusses problems and

solutions and interprets empirical results.

Handbook of Applied Spatial Analysis - Manfred M. Fischer

2009-12-24

The Handbook is written for academics, researchers, practitioners and advanced graduate students. It has been designed to be read by those new or starting out in the field of spatial analysis as well as by those who are already familiar with the field. The chapters have been written in such a way that readers who are new to the field will gain important overview and insight. At the same time, those readers who are already practitioners in the field will gain through the advanced and/or updated tools and new materials and state-of-the-art developments included. This volume provides an accounting of the diversity of current and emergent approaches, not available elsewhere despite the many excellent journals and te- books that exist. Most of the chapters are original, some few are reprints from the Journal of Geographical Systems, Geographical Analysis, The Review of Regional Studies and Letters of Spatial and Resource Sciences. We let our contributors - velop, from their particular perspective and insights, their own strategies for m- ping the part of terrain for which they were responsible. As the chapters were submitted, we became the first consumers of the project we had initiated. We gained from depth, breadth and distinctiveness of our contributors' insights and, in particular, the presence of links between them.

Handbook of Energy Economics and Policy - Alessandro Rubino

2021-05-01

Handbook of Energy Economics and Policy: Fundamentals and Applications for Engineers and Energy Planners presents energy engineers and managers with analytical skills and concepts that enable them to apply simple economic logic to understand the interrelations between energy technologies, economics, regulation and governance of the industry. Sections cover the origins, types and measurement of energy sources, transportation networks, and regulatory and policy issues on electricity and gas at a global level, new economic and policy issues, including innovation processes in the energy industry and economic and policy implications. Final sections cover state-of-the-art methods for modeling and predicting the dynamics of energy systems. Its unique approach and learning path makes this book an ideal resource for energy engineering practitioners and researchers working to design, develop, plan or deploy energy systems. Energy planners and policymakers will also find this to be a solid foundation on which to base decisions. Presents key-concepts and their interrelation with energy technologies and systems in a clear way for ready application during planning and deployment of energy technologies and systems Includes global case studies covering a wide array of energy sources and regulatory models Explores methodologies for modeling and forecasting the impacts of energy technologies and systems, as well as their costs and possible business models

A Primer on Nonmarket Valuation - Patricia A. Champ 2017-02-08

This is a practical book with clear descriptions of the most commonly used nonmarket methods. The first chapters of the book provide the context and theoretical foundation of nonmarket valuation along with a discussion of data collection procedures. The middle chapters describe the major stated- and revealed-preference valuation methods. For each method, the steps involved in implementation are laid out and carefully explained with supporting references from the published literature. The final chapters of the book examine the relevance of experimentation to economic valuation, the transfer of existing nonmarket values to new settings, and assessments of the reliability and validity of nonmarket values. The book is relevant to individuals in many professions at all career levels. Professionals in government agencies, attorneys involved with natural resource damage assessments, graduate students, and others will appreciate the thorough descriptions of how to design, implement, and analyze a nonmarket valuation study.

Geographically Weighted Regression - A. Stewart Fotheringham

2003-02-21

Geographical Weighted Regression (GWR) is a new local modelling technique for analysing spatial analysis. This technique allows local as opposed to global models of relationships to be measured and mapped. This is the first and only book on this technique, offering comprehensive coverage on this new 'hot' topic in spatial analysis. * Provides step-by-step examples of how to use the GWR model using data sets and examples on issues such as house price determinants, educational attainment levels and school performance statistics * Contains a broad discussion of and basic concepts on GWR through to ideas on statistical inference for GWR models * uniquely features accompanying author-written software that allows users to undertake sophisticated and

complex forms of GWR within a user-friendly, Windows-based, front-end (see book for details).

Applied Spatial Statistics and Econometrics - Katarzyna Kopczewska

2020-11-25

This textbook is a comprehensive introduction to applied spatial data analysis using R. Each chapter walks the reader through a different method, explaining how to interpret the results and what conclusions can be drawn. The author team showcases key topics, including unsupervised learning, causal inference, spatial weight matrices, spatial econometrics, heterogeneity and bootstrapping. It is accompanied by a suite of data and R code on Github to help readers practise techniques via replication and exercises. This text will be a valuable resource for advanced students of econometrics, spatial planning and regional science. It will also be suitable for researchers and data scientists working with spatial data.

2019-20 MATRIX Annals - Jan de Gier 2021-02-10

MATRIX is Australia's international and residential mathematical research institute. It facilitates new collaborations and mathematical advances through intensive residential research programs, each 1-4 weeks in duration. This book is a scientific record of the ten programs held at MATRIX in 2019 and the two programs held in January 2020: · Topology of Manifolds: Interactions Between High and Low Dimensions · Australian-German Workshop on Differential Geometry in the Large · Aperiodic Order meets Number Theory · Ergodic Theory, Diophantine Approximation and Related Topics · Influencing Public Health Policy with Data-informed Mathematical Models of Infectious Diseases · International Workshop on Spatial Statistics · Mathematics of Physiological Rhythms · Conservation Laws, Interfaces and Mixing · Structural Graph Theory Downunder · Tropical Geometry and Mirror Symmetry · Early Career Researchers Workshop on Geometric Analysis and PDEs · Harmonic Analysis and Dispersive PDEs: Problems and Progress The articles are grouped into peer-reviewed contributions and other contributions. The peer-reviewed articles present original results or reviews on a topic related to the MATRIX program; the remaining contributions are predominantly lecture notes or short articles based on talks or activities at MATRIX.

Handbook of Research Methods and Applications in Empirical Microeconomics - Hashimzade, Nigar 2021-11-18

Written in a comprehensive yet accessible style, this Handbook introduces readers to a range of modern empirical methods with applications in microeconomics, illustrating how to use two of the most popular software packages, Stata and R, in microeconomic applications.

Advanced Quantitative Research Methods for Urban Planners - Reid Ewing 2020-03-12

Advanced Quantitative Research Methods for Urban Planners provides fundamental knowledge and hands-on techniques about research, such as research topics and key journals in the planning field, advice for technical writing, and advanced quantitative methodologies. This book aims to provide the reader with a comprehensive and detailed understanding of advanced quantitative methods and to provide guidance on technical writing. Complex material is presented in the simplest and clearest way possible using real-world planning examples and making the theoretical content of each chapter as tangible as possible. Hands-on techniques for a variety of quantitative research studies are covered to provide graduate students, university faculty, and professional researchers with useful guidance and references. A companion to Basic Quantitative Research Methods for Urban Planners, Advanced Quantitative Research Methods for Urban Planners is an ideal read for researchers who want to branch out methodologically and for practicing planners who need to conduct advanced analyses with planning data.

Modelling Spatial and Spatial-Temporal Data: A Bayesian Approach -

Robert P. Haining 2020-01-27

Modelling Spatial and Spatial-Temporal Data: A Bayesian Approach is aimed at statisticians and quantitative social, economic and public health students and researchers who work with spatial and spatial-temporal data. It assumes a grounding in statistical theory up to the standard linear regression model. The book compares both hierarchical and spatial econometric modelling, providing both a reference and a teaching text with exercises in each chapter. The book provides a fully Bayesian, self-contained, treatment of the underlying statistical theory, with chapters dedicated to substantive applications. The book includes WinBUGS code and R code and all datasets are available online. Part I covers fundamental issues arising when modelling spatial and spatial-

temporal data. Part II focuses on modelling cross-sectional spatial data and begins by describing exploratory methods that help guide the modelling process. There are then two theoretical chapters on Bayesian models and a chapter of applications. Two chapters follow on spatial econometric modelling, one describing different models, the other substantive applications. Part III discusses modelling spatial-temporal data, first introducing models for time series data. Exploratory methods for detecting different types of space-time interaction are presented followed by two chapters on the theory of space-time separable (without space-time interaction) and inseparable (with space-time interaction) models. An applications chapter includes: the evaluation of a policy intervention; analysing the temporal dynamics of crime hotspots; chronic disease surveillance; and testing for evidence of spatial spillovers in the spread of an infectious disease. A final chapter suggests some future directions and challenges.

Panel Data Econometrics - Mike Tsionas 2019-06-19

Panel Data Econometrics: Theory introduces econometric modelling. Written by experts from diverse disciplines, the volume uses longitudinal datasets to illuminate applications for a variety of fields, such as banking, financial markets, tourism and transportation, auctions, and experimental economics. Contributors emphasize techniques and applications, and they accompany their explanations with case studies, empirical exercises and supplementary code in R. They also address panel data analysis in the context of productivity and efficiency analysis, where some of the most interesting applications and advancements have recently been made. Provides a vast array of empirical applications useful to practitioners from different application environments. Accompanied by extensive case studies and empirical exercises. Includes empirical chapters accompanied by supplementary code in R, helping researchers replicate findings. Represents an accessible resource for diverse industries, including health, transportation, tourism, economic growth, and banking, where researchers are not always econometrics experts.

Applied Spatial Data Analysis with R - Roger S. Bivand 2013-06-21

Applied Spatial Data Analysis with R, second edition, is divided into two basic parts, the first presenting R packages, functions, classes and methods for handling spatial data. This part is of interest to users who need to access and visualise spatial data. Data import and export for many file formats for spatial data are covered in detail, as is the interface between R and the open source GRASS GIS and the handling of spatio-temporal data. The second part showcases more specialised kinds of spatial data analysis, including spatial point pattern analysis, interpolation and geostatistics, areal data analysis and disease mapping. The coverage of methods of spatial data analysis ranges from standard techniques to new developments, and the examples used are largely taken from the spatial statistics literature. All the examples can be run using R contributed packages available from the CRAN website, with code and additional data sets from the book's own website. Compared to the first edition, the second edition covers the more systematic approach towards handling spatial data in R, as well as a number of important and widely used CRAN packages that have appeared since the first edition. This book will be of interest to researchers who intend to use R to handle, visualise, and analyse spatial data. It will also be of interest to spatial data analysts who do not use R, but who are interested in practical aspects of implementing software for spatial data analysis. It is a suitable companion book for introductory spatial statistics courses and for applied methods courses in a wide range of subjects using spatial data, including human and physical geography, geographical information science and geoinformatics, the environmental sciences, ecology, public health and disease control, economics, public administration and political science. The book has a website where complete code examples, data sets, and other support material may be found:

<http://www.asdar-book.org>. The authors have taken part in writing and maintaining software for spatial data handling and analysis with R in concert since 2003.

Spatial Analysis Using Big Data - Yoshiki Yamagata 2019-11-03

Spatial Analysis Using Big Data: Methods and Urban Applications helps readers understand the most powerful, state-of-the-art spatial econometric methods, focusing particularly on urban research problems. The methods represent a cluster of potentially transformational socio-economic modeling tools that allow researchers to capture real-time and high-resolution information to potentially reveal new socioeconomic dynamics within urban populations. Each method, written by leading exponents of the discipline, uses real-time urban big data to solve research problems in spatial science. Urban applications of these

methods are provided in unsurpassed depth, with chapters on surface temperature mapping, view value analysis, community clustering and spatial-social networks, among many others. Reviews some of the most powerful and challenging modern methods to study big data problems in spatial science. Provides computer codes written in R, MATLAB and Python to help implement methods. Applies these methods to common problems observed in urban and regional economics.

Spatial Analysis Methods and Practice - George Grekousis 2020-03-31

This is an introductory textbook on spatial analysis and spatial statistics through GIS. Each chapter presents methods and metrics, explains how to interpret results, and provides worked examples. Topics include: describing and mapping data through exploratory spatial data analysis; analyzing geographic distributions and point patterns; spatial autocorrelation; spatial clustering; geographically weighted regression and OLS regression; and spatial econometrics. The worked examples link theory to practice through a single real-world case study, with software and illustrated guidance. Exercises are solved twice: first through ArcGIS, and then GeoDa. Through a simple methodological framework the book describes the dataset, explores spatial relations and associations, and builds models. Results are critically interpreted, and the advantages and pitfalls of using various spatial analysis methods are discussed. This is a valuable resource for graduate students and researchers analyzing geospatial data through a spatial analysis lens, including those using GIS in the environmental sciences, geography, and social sciences.

Frontiers of Digital Transformation - Kazuya Takeda 2021-05-18

Proposing the concept of real-world data circulation (RWDC), this book presents various practical and industry-related studies in human, mechanical, and social data domains. RWDC is a new field of study, established by the information technology (IT) community. In the real world, the speed of data transmission between computers surpassed that of human communications long ago and has since expanded exponentially. As a result, the origin of the majority of data has become non-human, mechanical, or natural sources; in fact, humans are merely the source of a small part of the current data explosion. Such expanding data transmission does not simply consist of single source-destination pairs, but actually circulates over a complex network connecting numerous sources and destinations. Such circulation is an important aspect of the underlying systems. Based on this concept, in order to tame and control the massive amount of data originating from non-human sources, the authors have been considering the insertion of acquisition, analysis, and implementation processes in the flow of data circulation. This book introduces the outcome of the RWDC degree program organized at Nagoya University, Japan, collecting contributions from graduate students enrolled in the program from various research fields targeting diverse applications. Through examples of RWDC, the resulting creation of social value is illustrated. This book will be useful not only for those working on the topics discussed, but also to anyone who is interested in RWDC, digital transformation, and Industry 4.0.

Spatial Microeconometrics - Giuseppe Arbia 2021-03-26

Spatial Microeconometrics introduces the reader to the basic concepts of spatial statistics, spatial econometrics and the spatial behavior of economic agents at the microeconomic level. Incorporating useful examples and presenting real data and datasets on real firms, the book takes the reader through the key topics in a systematic way. The book outlines the specificities of data that represent a set of interacting individuals with respect to traditional econometrics that treat their locational choices as exogenous and their economic behavior as independent. In particular, the authors address the consequences of neglecting such important sources of information on statistical inference and how to improve the model predictive performances. The book presents the theory, clarifies the concepts and instructs the readers on how to perform their own analyses, describing in detail the codes which are necessary when using the statistical language R. The book is written by leading figures in the field and is completely up to date with the very latest research. It will be invaluable for graduate students and researchers in economic geography, regional science, spatial econometrics, spatial statistics and urban economics.

Applied Choice Analysis - David A. Hensher 2015-06-11

A fully updated second edition of this popular introduction to applied choice analysis, written for graduate students, researchers, professionals and consultants.

Bayesian Hierarchical Models - Peter D. Congdon 2019-09-16

An intermediate-level treatment of Bayesian hierarchical models and their applications, this book demonstrates the advantages of a Bayesian

approach to data sets involving inferences for collections of related units or variables, and in methods where parameters can be treated as random collections. Through illustrative data analysis and attention to statistical computing, this book facilitates practical implementation of Bayesian hierarchical methods. The new edition is a revision of the book *Applied Bayesian Hierarchical Methods*. It maintains a focus on applied modelling and data analysis, but now using entirely R-based Bayesian computing options. It has been updated with a new chapter on regression for causal effects, and one on computing options and strategies. This latter chapter is particularly important, due to recent advances in Bayesian computing and estimation, including the development of rjags and rstan. It also features updates throughout with new examples. The examples exploit and illustrate the broader advantages of the R computing environment, while allowing readers to explore alternative likelihood assumptions, regression structures, and assumptions on prior densities. Features: Provides a comprehensive and accessible overview of applied Bayesian hierarchical modelling Includes many real data examples to illustrate different modelling topics R code (based on rjags, jagsUI, R2OpenBUGS, and rstan) is integrated into the book, emphasizing implementation Software options and coding principles are introduced in new chapter on computing Programs and data sets available on the book's website

Integrated Uncertainty in Knowledge Modelling and Decision Making - Van-Nam Huynh 2020-11-02

This book constitutes the refereed proceedings of the 8th International Symposium on Integrated Uncertainty in Knowledge Modelling and Decision Making, IUKM 2020, held in Phuket, Thailand, in November 2020.* The 35 full papers presented were carefully reviewed and selected from 55 submissions. The papers deal with all aspects of uncertainty modelling and management and are organized in topical sections on uncertainty management and decision support; machine learning; machine learning applications; econometric applications; and statistical methods. * The conference was held virtually due to the COVID-19 pandemic.

Macroeconomic Survey Expectations - Michael P. Clements 2018-12-31

Why should we be interested in macroeconomic survey expectations?

This important book offers an in-depth treatment of this question from a point of view not covered in existing works on time-series econometrics and forecasting. Clements presents the nature of survey data, addresses some of the difficulties posed by the way in which survey expectations are elicited and considers the evaluation of point predictions and probability distributions. He outlines how, from a behavioural perspective, surveys offer insight into how economic agents form their expectations.

Modern Spatial Econometrics in Practice - Luc Anselin 2014-12-27

This book is the definitive user's guide to the spatial regression functionality in the software packages GeoDa and GeoDaSpace, as well as the spreg module in the PySAL library --all developed at the GeoDa Center for Geospatial Analysis and Computation. The book provides the techniques to test for and estimate spatial effects in linear regression models, addressing both spatial dependence (spatial autoregressive models) as well as spatial heterogeneity (spatial regimes models). The book also serves as an introduction and a practical guide to spatial econometrics in that it covers the methodological principles and formal results that underlie the various estimation methods, test procedures and model characteristics computed by the software. While the classical maximum likelihood estimation is included, the book's coverage emphasizes modern techniques based on the principle of generalized method of moments (GMM).

Bayesian Econometric Methods - Joshua Chan 2019-08-15

Bayesian Econometric Methods examines principles of Bayesian inference by posing a series of theoretical and applied questions and providing detailed solutions to those questions. This second edition adds extensive coverage of models popular in finance and macroeconomics,

including state space and unobserved components models, stochastic volatility models, ARCH, GARCH, and vector autoregressive models. The authors have also added many new exercises related to Gibbs sampling and Markov Chain Monte Carlo (MCMC) methods. The text includes regression-based and hierarchical specifications, models based upon latent variable representations, and mixture and time series specifications. MCMC methods are discussed and illustrated in detail - from introductory applications to those at the current research frontier - and MATLAB® computer programs are provided on the website accompanying the text. Suitable for graduate study in economics, the text should also be of interest to students studying statistics, finance, marketing, and agricultural economics.

Random Fields for Spatial Data Modeling - Dionissios T. Hristopulos 2020-02-17

This book provides an inter-disciplinary introduction to the theory of random fields and its applications. Spatial models and spatial data analysis are integral parts of many scientific and engineering disciplines. Random fields provide a general theoretical framework for the development of spatial models and their applications in data analysis. The contents of the book include topics from classical statistics and random field theory (regression models, Gaussian random fields, stationarity, correlation functions) spatial statistics (variogram estimation, model inference, kriging-based prediction) and statistical physics (fractals, Ising model, simulated annealing, maximum entropy, functional integral representations, perturbation and variational methods). The book also explores links between random fields, Gaussian processes and neural networks used in machine learning. Connections with applied mathematics are highlighted by means of models based on stochastic partial differential equations. An interlude on autoregressive time series provides useful lower-dimensional analogies and a connection with the classical linear harmonic oscillator. Other chapters focus on non-Gaussian random fields and stochastic simulation methods. The book also presents results based on the author's research on Spartan random fields that were inspired by statistical field theories originating in physics. The equivalence of the one-dimensional Spartan random field model with the classical, linear, damped harmonic oscillator driven by white noise is highlighted. Ideas with potentially significant computational gains for the processing of big spatial data are presented and discussed. The final chapter concludes with a description of the Karhunen-Loève expansion of the Spartan model. The book will appeal to engineers, physicists, and geoscientists whose research involves spatial models or spatial data analysis. Anyone with background in probability and statistics can read at least parts of the book. Some chapters will be easier to understand by readers familiar with differential equations and Fourier transforms.

A Primer for Spatial Econometrics - Giuseppe Arbia 2014-06-30

A Primer for Spatial Econometrics aims to meet a growing demand in the field by introducing basic spatial econometrics methodologies to a wide variety of researchers. Spatial econometrics is a relatively new topic that is becoming increasingly popular in many of the social sciences. Readers will find this text to be an approachable, informative springboard for their own research and an invaluable support for those that want to start working immediately with the methods. It moves beyond previous studies as it is aimed explicitly at bridging the gap between a basic econometric textbook and more specialized texts in the subject. This book provides a practical guide that illustrates the potential of spatial econometric modelling, discusses problems and solutions and enables the reader both to interpret empirical results correctly and to start working with the methods. It provides essential notions and key insights as well as providing references for further reading to more in-depth discussions. Readers will appreciate the extensive presentation of examples in 'R', which has emerged as the software of choice for model builders in this area. The text is integrated with real numerical examples, problem sets and practical exercises and also contains a description of the essential computer codes of the statistical software 'R'.