Data Science And Simulation In Transportation Research

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Forecasting Urban Travel - David E. Boyce 2015-02-27 Forecasting Urban Travel presents in a non-mathematical way the evolution of methods, models and theories underpinning travel forecasts and policy analysis, from the early urban transportation studies of the 1950s to current applications throughout the **Transportation Systems and Engineering: Concepts, Methodologies, Tools, and Applications** - Management Association, Information Resources 2015-06-30 From driverless cars to vehicular networks, recent technological advances are being employed to increase road safety and improve driver satisfaction. As with any newly developed technology,

researchers must take care to address all concerns, limitations, and dangers before widespread public adoption. Transportation Systems and Engineering: Concepts, Methodologies, Tools, and Applications addresses current trends in transportation technologies, such as smart cars, green technologies, and infrastructure development. This multivolume book is a critical reference source for engineers, computer scientists, transportation authorities, students, and practitioners in the field of transportation systems management.

Exploring Implicit Cognition: Learning, Memory, and Social Cognitive Processes - Jin, Zheng 2014-10-31

While widely studied, the capacity of the human mind remains largely unexplored. As such, researchers are continually seeking ways to understand the brain, its function, and its impact on human behavior. Exploring Implicit Cognition: Learning, Memory, and Social Cognitive Processes explores research surrounding the ways in which an individual's unconscious is able to influence and impact that person's behavior without their awareness. Focusing on topics pertaining to social cognition and the unconscious process, this title is ideal for use by students, researchers, psychologists, and academicians interested in the latest insights into implicit cognition.

Renewable and Alternative Energy: Concepts, Methodologies, Tools, and Applications - Management Association, Information Resources 2016-10-19

As the human population expands and natural resources become depleted, it becomes necessary to explore other sources for energy consumption and usage. Renewable and Alternative Energy: Concepts, Methodologies, Tools, and Applications provides a comprehensive overview of emerging perspectives and innovations for alternative energy sources. Highlighting relevant concepts on energy

efficiency, current technologies, and ongoing industry trends, this is an ideal reference source for academics, practitioners, professionals, and upper-level students interested in the latest research on renewable energy.

Innovative Applications of Big Data in the Railway Industry - Kohli, Shruti 2017-11-30

Use of big data has proven to be beneficial within many different industries, especially in the field of engineering; however, infiltration of this type of technology into more traditional heavy industries, such as the railways, has been limited. Innovative Applications of Big Data in the Railway Industry is a pivotal reference source for the latest research findings on the utilization of data sets in the railway industry. Featuring extensive coverage on relevant areas such as driver support systems, railway safety management, and obstacle detection, this publication is an ideal resource for transportation planners, engineers, policymakers, and graduate-level engineering students seeking current research on a specific application of big data and its effects on transportation.

Data-Driven Solutions to Transportation Problems - Yinhai Wang 2018-12-04

Data-Driven Solutions to Transportation Problems explores the fundamental principle of analyzing different types of transportation-related data using methodologies such as the data fusion model, the big data mining approach, computer vision-enabled traffic sensing data analysis, and machine learning. The book examines the state-of-the-art in data-enabled methodologies, technologies and applications in transportation. Readers will learn how to solve problems relating to energy efficiency under connected vehicle environments, urban travel behavior, trajectory data-based travel pattern identification, public transportation analysis, traffic signal control efficiency, optimizing traffic networks network, and much more. Synthesizes the newest

developments in data-driven transportation science Includes case studies and examples in each chapter that illustrate the application of methodologies and technologies employed Useful for both theoretical and technically-oriented researchers

Marketing Data Science - Thomas W. Miller 2015-05-02 Now , a leader of Northwestern University's prestigious analytics program presents a fully-integrated treatment of both the business and academic elements of marketing applications in predictive analytics. Writing for both managers and students, Thomas W. Miller explains essential concepts, principles, and theory in the context of real-world applications. Building on Miller's pioneering program, Marketing Data Science thoroughly addresses segmentation, target marketing, brand and product positioning, new product development, choice modeling, recommender systems, pricing research, retail site selection, demand estimation, sales forecasting, customer retention, and lifetime value analysis. Starting where Miller's widely-praised Modeling Techniques in Predictive Analytics left off, he integrates crucial information and insights that were previously segregated in texts on web analytics, network science, information technology, and programming. Coverage includes: The role of analytics in delivering effective messages on the web Understanding the web by understanding its hidden structures Being recognized on the web – and watching your own competitors Visualizing networks and understanding communities within them Measuring sentiment and making recommendations Leveraging key data science methods: databases/data preparation, classical/Bayesian statistics, regression/classification, machine learning, and text analytics Six complete case studies address exceptionally relevant issues such as: separating legitimate email

from spam; identifying legally-relevant information for lawsuit discovery; gleaning insights from anonymous web surfing data, and more. This text's extensive set of web and network problems draw on rich public-domain data sources; many are accompanied by solutions in Python and/or R. Marketing Data Science will be an invaluable resource for all students, faculty, and professional marketers who want to use business analytics to improve marketing performance.

Mobility Patterns, Big Data and Transport Analytics - Constantinos Antoniou 2018-12-11

Mobility Patterns, Big Data and Transport Analytics provides a guide to the new analytical framework and its relation to big data, focusing on capturing, predicting, visualizing and controlling mobility patterns - a key aspect of transportation modeling. The book features prominent international experts who provide overviews on new analytical frameworks, applications and concepts in mobility analysis and transportation systems. Users will find a detailed, mobility 'structural' analysis and a look at the extensive behavioral characteristics of transport, observability requirements and limitations for realistic transportation applications and transportation systems analysis that are related to complex processes and phenomena. This book bridges the gap between big data, data science, and transportation systems analysis with a study of big data's impact on mobility and an introduction to the tools necessary to apply new techniques. The book covers in detail, mobility 'structural' analysis (and its dynamics), the extensive behavioral characteristics of transport, observability requirements and limitations for realistic transportation applications, and transportation systems analysis related to complex processes and phenomena. The book bridges the gap between big data, data science, and Transportation Systems

Analysis with a study of big data's impact on mobility, and an introduction to the tools necessary to apply new techniques. Guides readers through the paradigm-shifting opportunities and challenges of handling Big Data in transportation modeling and analytics Covers current analytical innovations focused on capturing, predicting, visualizing, and controlling mobility patterns, while discussing future trends Delivers an introduction to transportation-related information advances, providing a benchmark reference by world-leading experts in the field Captures and manages mobility patterns, covering multiple purposes and alternative transport modes, in a multi-disciplinary approach Companion website features videos showing the analyses performed, as well as test codes and data-sets, allowing readers to recreate the presented analyses and apply the highlighted techniques to their own data

Integrated Earthquake Simulation - M. Hori 2022-07-19

Integrated earthquake simulation (IES) is a new method for evaluating earthquake hazards and disasters induced in cities and urban areas. It utilises a sequence of numerical simulations of such aspects as earthquake wave propagation, ground motion amplification, structural seismic response, and mass evacuation. This book covers the basics of numerical analysis methods of solving wave equations, analyzing structural responses, and developing agent models for mass evaluation, which are implemented in IES. IES makes use of Monte-Carlo simulation, which takes account of the effects of uncertainties related to earthquake scenarios and the modeling of structures both above and below ground, and facilitates a better estimate of overall earthquake and disaster hazard. It also presents the recent achievement of enhancing IES with high-performance computing capability that can make use of

automated models which employ various numerical analysis methods. Detailed examples of IES for the Tokyo Metropolis Earthquake and the Nankai Trough Earthquake are given, which use large scale analysis models of actual cities and urban areas.

Empowering Human Dynamics Research with Social Media and Geospatial Data Analytics - Atsushi Nara 2021-09-20

This book discusses theoretical backgrounds, techniques and methodologies, and applications of the current state-of-the-art human dynamics research utilizing social media and geospatial big data. It describes various forms of social media and big data with location information, theory development, data collection and management techniques, and analytical methodologies to conduct human dynamics research including geographic information systems (GIS), spatiotemporal data analytics, text mining and semantic analysis, machine learning, trajectory data analysis, and geovisualization. The book also covers applied interdisciplinary research examples ranging from disaster management, public health, urban geography, and spatiotemporal information diffusion. By providing theoretical foundations, solid empirical research backgrounds, techniques, and methodologies as well as application examples from diverse interdisciplinary fields, this book will be a valuable resource to students, researchers and practitioners who utilize or plan to employ social media and big data in their work.

Proceedings of the Sixth International Conference of Transportation Research Group of India - Lelitha Devi 2022-09-28

This book comprises the proceedings of the Sixth International Conference of Transportation Research Group of India (CTRG2021) focusing on emerging opportunities and challenges in the field of transportation of people and freight. The contents of the

volume include characterization of conventional and innovative pavement materials, operational effects of road geometry, user impact of multimodal transport projects, spatial analysis of travel patterns, socio-economic impacts of transport projects, analysis of transportation policy and planning for safety and security, technology enabled models of mobility services, etc. This book will be beneficial to researchers, educators, practitioners and policy makers alike.

Social-Behavioral Modeling for Complex Systems - Paul K. Davis 2019-03-18

This volume describes frontiers in social-behavioral modeling for contexts as diverse as national security, health, and on-line social gaming. Recent scientific and technological advances have created exciting opportunities for such improvements. However, the book also identifies crucial scientific, ethical, and cultural challenges to be met if social-behavioral modeling is to achieve its potential. Doing so will require new methods, data sources, and technology. The volume discusses these, including those needed to achieve and maintain high standards of ethics and privacy. The result should be a new generation of modeling that will advance science and, separately, aid decision-making on major social and security-related subjects despite the myriad uncertainties and complexities of social phenomena. Intended to be relatively comprehensive in scope, the volume balances theory-driven, data-driven, and hybrid approaches. The latter may be rapidly iterative, as when artificial-intelligence methods are coupled with theory-driven insights to build models that are sound, comprehensible and usable in new situations. With the intent of being a milestone document that sketches a research agenda for the next decade, the volume draws on the wisdom, ideas and suggestions of many noted researchers who draw in turn from anthropology,

communications, complexity science, computer science, defense planning, economics, engineering, health systems, medicine, neuroscience, physics, political science, psychology, public policy and sociology. In brief, the volume discusses: Cutting-edge challenges and opportunities in modeling for social and behavioral science Special requirements for achieving high standards of privacy and ethics New approaches for developing theory while exploiting both empirical and computational data Issues of reproducibility, communication, explanation, and validation Special requirements for models intended to inform decision making about complex social systems

Introduction to Transportation Analysis, Modeling and Simulation - Dietmar P.F. Möller 2014-10-13

This comprehensive textbook/reference provides an in-depth overview of the key aspects of transportation analysis, with an emphasis on modeling real transportation systems and executing the models. Topics and features: presents comprehensive review questions at the end of each chapter, together with detailed case studies, useful links, references and suggestions for further reading; supplies a variety of teaching support materials at the book's webpage on Springer.com, including a complete set of lecture slides; examines the classification of models used for multimodal transportation systems, and reviews the models and evaluation methods used in transportation planning; explains traffic assignment to road networks, and describes computer simulation integration platforms and their use in the transportation systems sector; provides an overview of transportation simulation tools, and discusses the critical issues in the design, development and use of the simulation models.

Data Science and Simulation in Transportation Research - Davy

Janssens 2014
"This book highlights entirely new and detailed spatial-temporal micro-simulation methodologies for human mobility and the emerging dynamics of our society, offering novel ideas grounded in big data from various data mining and transportation science sources"--
The Multi-Agent Transport Simulation MATSim - Andreas Horni 2016-08-10
The MATSim (Multi-Agent Transport Simulation) software project was started around 2006 with the goal of generating traffic and congestion patterns by following individual synthetic travelers through their daily or weekly activity programme. It has since then evolved from a collection of stand-alone C++ programs to an integrated Java-based framework which is publicly hosted, open-source available, automatically regression tested. It is currently used by about 40 groups throughout the world. This book takes stock of the current status. The first part of the book gives an introduction to the most important concepts, with the intention of enabling a potential user to set up and run basic simulations. The second part of the book describes how the basic functionality can be extended, for example by adding schedule-based public transit, electric or autonomous cars, paratransit, or within-day replanning. For each extension, the text provides pointers to the additional documentation and to the code base. It is also discussed how people with appropriate Java programming skills can write their own extensions, and plug them into the MATSim core. The project has started from the basic idea that traffic is a consequence of human behavior, and thus humans and their behavior should be the starting point of all modelling, and with the intuition that when simulations with 100 million particles are possible in computational physics, then behavior-oriented simulations with 10 million travelers should be possible in travel behavior research. The

initial implementations thus combined concepts from computational physics and complex adaptive systems with concepts from travel behavior research. The third part of the book looks at theoretical concepts that are able to describe important aspects of the simulation system; for example, under certain conditions the code becomes a Monte Carlo engine sampling from a discrete choice model. Another important aspect is the interpretation of the MATSim score as utility in the microeconomic sense, opening up a connection to benefit cost analysis. Finally, the book collects use cases as they have been undertaken with MATSim. All current users of MATSim were invited to submit their work, and many followed with sometimes crisp and short and sometimes longer contributions, always with pointers to additional references. We hope that the book will become an invitation to explore, to build and to extend agent-based modeling of travel behavior from the stable and well tested core of MATSim documented here.

Creativity in Intelligent Technologies and Data Science - Alla Kravets 2017-08-28

This book constitutes the refereed proceedings of the Second Conference on Creativity in Intelligent Technologies and Data Science, CIT&DS 2017, held in Volgograd, Russia, in September 2017. The 58 revised full papers and two keynote papers presented were carefully reviewed and selected from 194 submissions. The papers are organized in topical sections on Knowledge Discovery in Patent and Open Sources for Creative Tasks; Open Science Semantic Technologies; Computer Vision and Knowledge-Based Control; Pro-Active Modeling in Intelligent Decision Making Support; Data Science in Energy Management and Urban Computing; Design Creativity in CASE/CAI/CAD/PDM; Intelligent Internet of Services and Internet of Things; Data

Science in Social Networks Analysis; Creativity and Game-Based Learning; Intelligent Assistive Technologies: Software Design and Application.

Creative and Collaborative Learning through Immersion - Anna Hui 2021-08-10

This book includes instructional design and practice of how immersive technology is integrated in discipline-based and interdisciplinary curriculum design. It focuses on pedagogical models and learning outcomes of immersive learning experiences and demonstrates how immersive learning can be applied in industries. This book brings scholars, researchers and educators together around an international and interdisciplinary consolidation and reflection on learning through immersion. The originality lies in how advanced technology and contemporary pedagogical models can integrate to enhance student engagement and learning effectiveness in higher education.

Logic-Driven Traffic Big Data Analytics - Shaopeng Zhong 2022

This book starts from the relationship between urban built environment and travel behavior and focuses on analyzing the origin of traffic phenomena behind the data through multi-source traffic big data, which makes the book unique and different from the previous data-driven traffic big data analysis literature. This book focuses on understanding, estimating, predicting, and optimizing mobility patterns. Readers can find multi-source traffic big data processing methods, related statistical analysis models, and practical case applications from this book. This book bridges the gap between traffic big data, statistical analysis models, and mobility pattern analysis with a systematic investigation of traffic big datas impact on mobility patterns and urban planning.

Data Analytics for Intelligent Transportation Systems -

Mashrur Chowdhury 2017-04-05
Data Analytics for Intelligent Transportation Systems provides in-depth coverage of data-enabled methods for analyzing intelligent transportation systems that includes detailed coverage of the tools needed to implement these methods using big data analytics and other computing techniques. The book examines the major characteristics of connected transportation systems, along with the fundamental concepts of how to analyze the data they produce. It explores collecting, archiving, processing, and distributing the data, designing data infrastructures, data management and delivery systems, and the required hardware and software technologies. Users will learn how to design effective data visualizations, tactics on the planning process, and how to evaluate alternative data analytics for different connected transportation applications, along with key safety and environmental applications for both commercial and passenger vehicles, data privacy and security issues, and the role of social media data in traffic planning. Includes case studies in each chapter that illustrate the application of concepts covered Presents extensive coverage of existing and forthcoming intelligent transportation systems and data analytics technologies Contains contributors from both leading academic and commercial researchers Explains how to design effective data visualizations, tactics on the planning process, and how to evaluate alternative data analytics for different connected transportation applications

Artificial Intelligence, Big Data and Data Science in Statistics - Ansgar Steland 2022-11-15
This book discusses the interplay between statistics, data science, machine learning and artificial intelligence, with a focus on environmental science, the natural sciences, and technology. It covers the

state of the art from both a theoretical and a practical viewpoint and describes how to successfully apply machine learning methods, demonstrating the benefits of statistics for modeling and analyzing high-dimensional and big data. The book's expert contributions include theoretical studies of machine learning methods, expositions of general methodologies for sound statistical analyses of data as well as novel approaches to modeling and analyzing data for specific problems and areas. In terms of applications, the contributions deal with data as arising in industrial quality control, autonomous driving, transportation and traffic, chip manufacturing, photovoltaics, football, transmission of infectious diseases, Covid-19 and public health. The book will appeal to statisticians and data scientists, as well as engineers and computer scientists working in related fields or applications.

Advances in Social Simulation - Petra Ahrweiler 2021-04-26

This book presents the state of the art in social simulation as presented at the Social Simulation Conference 2019 in Mainz, Germany. It covers the developments in applications and methods of social simulation, addressing societal issues such as socio-ecological systems and policymaking. Methodological issues discussed include large-scale empirical calibration, model sharing and interdisciplinary research, as well as decision-making models, validation and the use of qualitative data in simulation modeling. Research areas covered include archaeology, cognitive science, economics, organization science and social simulation education. This book gives readers insight into the increasing use of social simulation in both its theoretical development and in practical applications such as policymaking whereby modeling and the behavior of complex systems is key. The book appeals to students, researchers and professionals in the various fields.

Mobility Patterns, Big Data and Transport Analytics - Constantinos Antoniou 2018-11-27

Mobility Patterns, Big Data and Transport Analytics provides a guide to the new analytical framework and its relation to big data, focusing on capturing, predicting, visualizing and controlling mobility patterns - a key aspect of transportation modeling. The book features prominent international experts who provide overviews on new analytical frameworks, applications and concepts in mobility analysis and transportation systems. Users will find a detailed, mobility 'structural' analysis and a look at the extensive behavioral characteristics of transport, observability requirements and limitations for realistic transportation applications and transportation systems analysis that are related to complex processes and phenomena. This book bridges the gap between big data, data science, and transportation systems analysis with a study of big data's impact on mobility and an introduction to the tools necessary to apply new techniques. The book covers in detail, mobility 'structural' analysis (and its dynamics), the extensive behavioral characteristics of transport, observability requirements and limitations for realistic transportation applications, and transportation systems analysis related to complex processes and phenomena. The book bridges the gap between big data, data science, and Transportation Systems Analysis with a study of big data's impact on mobility, and an introduction to the tools necessary to apply new techniques. Guides readers through the paradigm-shifting opportunities and challenges of handling Big Data in transportation modeling and analytics Covers current analytical innovations focused on capturing, predicting, visualizing, and controlling mobility patterns, while discussing future trends Delivers an introduction to transportation-related

information advances, providing a benchmark reference by world-leading experts in the field Captures and manages mobility patterns, covering multiple purposes and alternative transport modes, in a multi-disciplinary approach Companion website features videos showing the analyses performed, as well as test codes and data-sets, allowing readers to recreate the presented analyses and apply the highlighted techniques to their own data

Simulation for Data Science with R - Matthias Templ 2016-06-30

Harness actionable insights from your data with computational statistics and simulations using R About This Book Learn five different simulation techniques (Monte Carlo, Discrete Event Simulation, System Dynamics, Agent-Based Modeling, and Resampling) in-depth using real-world case studies A unique book that teaches you the essential and fundamental concepts in statistical modeling and simulation Who This Book Is For This book is for users who are familiar with computational methods. If you want to learn about the advanced features of R, including the computer-intense Monte-Carlo methods as well as computational tools for statistical simulation, then this book is for you. Good knowledge of R programming is assumed/required. What You Will Learn The book aims to explore advanced R features to simulate data to extract insights from your data. Get to know the advanced features of R including high-performance computing and advanced data manipulation See random number simulation used to simulate distributions, data sets, and populations Simulate close-to-reality populations as the basis for agent-based micro-, model- and design-based simulations Applications to design statistical solutions with R for solving scientific and real world problems Comprehensive coverage of several R statistical packages like boot, simPop, VIM, data.table, dplyr, parallel,

StatDA, simecol, simecolModels, deSolve and many more. In Detail Data Science with R aims to teach you how to begin performing data science tasks by taking advantage of Rs powerful ecosystem of packages. R being the most widely used programming language when used with data science can be a powerful combination to solve complexities involved with varied data sets in the real world. The book will provide a computational and methodological framework for statistical simulation to the users. Through this book, you will get in grips with the software environment R. After getting to know the background of popular methods in the area of computational statistics, you will see some applications in R to better understand the methods as well as gaining experience of working with real-world data and real-world problems. This book helps uncover the large-scale patterns in complex systems where interdependencies and variation are critical. An effective simulation is driven by data generating processes that accurately reflect real physical populations. You will learn how to plan and structure a simulation project to aid in the decision-making process as well as the presentation of results. By the end of this book, you reader will get in touch with the software environment R. After getting background on popular methods in the area, you will see applications in R to better understand the methods as well as to gain experience when working on real-world data and real-world problems. Style and approach This book takes a practical, hands-on approach to explain the statistical computing methods, gives advice on the usage of these methods, and provides computational tools to help you solve common problems in statistical simulation and computer-intense methods.

Modeling Techniques in Predictive Analytics with Python and R - Thomas W. Miller 2014

Using Phyton and R, the author

addresses multiple business challenge, including segmentation, brand positioning, product choice modeling, pricing research, finance, sprots, text analytics, sentiment analysis and social network analysis, cross sectional data, time series, spatial and spatio-temporal data.

Traffic Simulation and Data - Winnie Daamen 2014-09-17

A single source of information for researchers and professionals, Traffic Simulation and Data: Validation Methods and Applications offers a complete overview of traffic data collection, state estimation, calibration and validation for traffic modelling and simulation. It derives from the Multitude Project-a European Cost Action project that incorpo

The 2020 International Conference on Machine Learning and Big Data Analytics for IoT Security and Privacy - John MacIntyre 2020-11-04

This book presents the proceedings of The 2020 International Conference on Machine Learning and Big Data Analytics for IoT Security and Privacy (SPIoT-2020), held in Shanghai, China, on November 6, 2020. Due to the COVID-19 outbreak problem, SPIoT-2020 conference was held online by Tencent Meeting. It provides comprehensive coverage of the latest advances and trends in information technology, science and engineering, addressing a number of broad themes, including novel machine learning and big data analytics methods for IoT security, data mining and statistical modelling for the secure IoT and machine learning-based security detecting protocols, which inspire the development of IoT security and privacy technologies. The contributions cover a wide range of topics: analytics and machine learning applications to IoT security; data-based metrics and risk assessment approaches for IoT; data confidentiality and privacy in IoT; and authentication and

access control for data usage in IoT. Outlining promising future research directions, the book is a valuable resource for students, researchers and professionals and provides a useful reference guide for newcomers to the IoT security and privacy field.

Transportation Science - Ziqiang Zeng 2018-11-15

Understanding data-driven transportation science is essential for addressing the newest challenges in the quickly developing intelligent transportation systems. Data-Driven Transportation Science explores the fundamental principle of analysing different types of transportation-related data using methodologies such as data fusion model, big data mining approach, computer vision-enabled traffic sensing data analysis, and machine learning. The book examines the state-of-the-art in data-enabled methodologies, technologies, and applications in transportation. The book helps readers solve such transportation systems problems as energy efficiency under connected vehicle environment, urban travel behavior, trajectory data based travel pattern identification, public transportation analysis, traffic signal control efficiency, optimizing traffic networks network, and much more Synthesizes the newest developments in data-driven transportation science Includes case studies and examples in each chapter that illustrate the application of methodologies and technologies employed Useful for both theoretical and technical oriented researchers

Simulation Approaches in Transportation Analysis - Ryuichi Kitamura 2006-03-10

Simulation Approaches in Transportation Analysis: Recent Advances and Challenges presents the latest developments in transport simulation, including dynamic network simulation and micro-simulation of people's movement in an urban area. It offers a collection of the major simulation models that are now in use throughout the world; it illustrates each model in detail, examines potential problems,

and points to directions for future development. The reader will be able to understand the functioning, applicability, and usefulness of advanced transport simulation models. The material in this book will be of wide use to graduate students and practitioners as well as researchers in the transportation engineering and planning fields.

Big Data Analytics Using Multiple Criteria Decision-Making Models - Ramakrishnan Ramanathan 2017-07-12

Multiple Criteria Decision Making (MCDM) is a subfield of Operations Research, dealing with decision making problems. A decision-making problem is characterized by the need to choose one or a few among a number of alternatives. The field of MCDM assumes special importance in this era of Big Data and Business Analytics. In this volume, the focus will be on modelling-based tools for Business Analytics (BA), with exclusive focus on the sub-field of MCDM within the domain of operations research. The book will include an Introduction to Big Data and Business Analytics, and challenges and opportunities for developing MCDM models in the era of Big Data.

Advanced Intelligent Predictive Models for Urban Transportation - R Sathiyaraj 2022-03-28

The book emphasizes the predictive models of Big Data, Genetic Algorithm, and IoT with a case study. The book illustrates the predictive models with integrated fuel consumption models for smart and safe traveling. The text is a coordinated amalgamation of research contributions and industrial applications in the field of Intelligent Transportation Systems. The advanced predictive models and research results were achieved with the case studies, deployed in real transportation environments. Features: Provides a smart traffic congestion avoidance system with an integrated fuel consumption model. Predicts traffic in short-term and

regular. This is illustrated with a case study. Efficient Traffic light controller and deviation system in accordance with the traffic scenario. IoT based Intelligent Transport Systems in a Global perspective. Intelligent Traffic Light Control System and Ambulance Control System. Provides a predictive framework that can handle the traffic on abnormal days, such as weekends, festival holidays. Bunch of solutions and ideas for smart traffic development in smart cities. This book focuses on advanced predictive models along with offering an efficient solution for smart traffic management system. This book will give a brief idea of the available algorithms/techniques of big data, IoT, and genetic algorithm and guides in developing a solution for smart city applications. This book will be a complete framework for ITS domain with the advanced concepts of Big Data Analytics, Genetic Algorithm and IoT. This book is primarily aimed at IT professionals. Undergraduates, graduates and researchers in the area of computer science and information technology will also find this book useful.

Proceedings of the Fifth International Conference of Transportation Research Group of India - Akhilesh Kumar Maurya 2022-03-05

This book (in three volumes) comprises the proceedings of the Fifth Conference of Transportation Research Group of India (CTRG2019) focusing on emerging opportunities and challenges in the field of transportation of people and freight. The contents of the volume include characterization of conventional and innovative pavement materials, operational effects of road geometry, user impact of multimodal transport projects, spatial analysis of travel patterns, socio-economic impacts of transport projects, analysis of transportation policy and planning for safety and security, technology enabled models of mobility services, etc. This book will be beneficial to researchers,

educators, practitioners and policy makers alike.

Soft Computing in Data Science - Michael W. Berry 2015-09-02

This book constitutes the refereed proceedings of the International Conference on Soft Computing in Data Science, SCDS 2015, held in Putrajaya, Malaysia, in September 2015. The 25 revised full papers presented were carefully reviewed and selected from 69 submissions. The papers are organized in topical sections on data mining; fuzzy computing; evolutionary computing and optimization; pattern recognition; human machine interface; hybrid methods.

Sports Analytics and Data Science - Thomas W. Miller 2015-11-18

This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. This up-to-the-minute reference will help you master all three facets of sports analytics — and use it to win! Sports Analytics and Data Science is the most accessible and practical guide to sports analytics for everyone who cares about winning and everyone who is interested in data science. You'll discover how successful sports analytics blends business and sports savvy, modern information technology, and sophisticated modeling techniques. You'll master the discipline through realistic sports vignettes and intuitive data visualizations–not complex math. Every chapter focuses on one key sports analytics application. Miller guides you through assessing players and teams, predicting scores and making game-day decisions, crafting brands and marketing messages, increasing revenue and profitability, and much more. Step by step, you'll learn how analysts transform raw data and analytical models into wins: both on the field and in any sports business.

Data Science and Simulation in Transportation Research - Janssens, Davy 2013-12-31

Given its effective techniques and theories from various sources and fields, data science is playing a vital role in transportation research and the consequences of the inevitable switch to electronic vehicles. This fundamental insight provides a step towards the solution of this important challenge. Data Science and Simulation in Transportation Research highlights entirely new and detailed spatial-temporal micro-simulation methodologies for human mobility and the emerging dynamics of our society. Bringing together novel ideas grounded in big data from various data mining and transportation science sources, this book is an essential tool for professionals, students, and researchers in the fields of transportation research and data mining.

Demand for Emerging Transportation Systems - Constantinos Antoniou 2019-12-02

Demand for Emerging Transportation Systems: Modeling Adoption, Satisfaction, and Mobility Patterns comprehensively examines the concepts and factors affecting user quality-of-service satisfaction. The book provides an introduction to the latest trends in transportation, followed by a critical review of factors affecting traditional and emerging transportation system adoption rates and user retention. This collection includes a rigorous introduction to the tools necessary for analyzing these factors, as well as Big Data collection methodologies, such as smartphone and social media analysis. Researchers will be guided through the nuances of transport and mobility services adoption, closing with an outlook of, and recommendations for, future research on the topic. This resource will appeal to practitioners and graduate students. Examines the dynamics affecting adoption rates for public transportation, vehicle-sharing, ridesharing systems and autonomous vehicles Covers the rationale

behind travelers' continuous use of mobility services and their satisfaction and development Includes case studies, featuring mobility stats and contributions from around the world

Machine Learning for Transportation Research and Applications - Yinhai Wang 2023-04-01

Transportation issues are often too complicated to be addressed by conventional parametric methods. Increasing data availability and recent advancements in machine learning provide new methods to tackle the challenging transportation problems. Readers will learn how to develop and apply different types of machine learning models to transportation related problems. Example applications include transportation data generations, traffic sensing, transportation mode recognition, transportation system management and control, traffic flow prediction, and traffic safety analysis.

New Horizons for a Data-Driven Economy - José María Cavanillas 2016-04-04

In this book readers will find technological discussions on the existing and emerging technologies across the different stages of the big data value chain. They will learn about legal aspects of big data, the social impact, and about education needs and requirements. And they will discover the business perspective and how big data technology can be exploited to deliver value within different sectors of the economy. The book is structured in four parts: Part I "The Big Data Opportunity" explores the value potential of big data with a particular focus on the European context. It also describes the legal, business and social dimensions that need to be addressed, and briefly introduces the European Commission's BIG project. Part II "The Big Data Value Chain" details the complete big data lifecycle from a technical point of view, ranging from data acquisition,

analysis, curation and storage, to data usage and exploitation. Next, Part III “Usage and Exploitation of Big Data” illustrates the value creation possibilities of big data applications in various sectors, including industry, healthcare, finance, energy, media and public services. Finally, Part IV “A Roadmap for Big Data Research” identifies and prioritizes the cross-sectorial requirements for big data research, and outlines the most urgent and challenging technological, economic, political and societal issues for big data in Europe. This compendium summarizes more than two years of work performed by a leading group of major European research centers and industries in the context of the BIG project. It brings together research findings, forecasts and estimates related to this challenging technological context that is becoming the major axis of the new digitally transformed business environment.

Demand for Emerging Transportation Systems - Constantinos Antoniou 2019-11 Demand for Emerging Transportation Systems: Modeling Adoption, Satisfaction, and Mobility Patterns comprehensively examines the concepts and factors affecting user quality-of-service satisfaction. The book provides an introduction to the latest trends in transportation, followed by a critical review of factors affecting traditional and emerging transportation system adoption rates and user retention. This collection includes a rigorous introduction to the tools necessary for analyzing these factors, as well as Big Data collection methodologies, such as smartphone and social media analysis. Researchers will be guided through the nuances of transport and mobility services adoption, closing with an outlook of, and recommendations for, future research on the topic. This resource will appeal to practitioners and graduate students. Examines the

dynamics affecting adoption rates for public transportation, vehicle-sharing, ridesharing systems and autonomous vehicles Covers the rationale behind travelers' continuous use of mobility services and their satisfaction and development Includes case studies, featuring mobility stats and contributions from around the world

Transport Simulation - Edward Chung 2019-05-07

In recent years, the transport simulation of large road networks has become far more rapid and detailed, and many exciting developments in this field have emerged. Within this volume, the authors describe the simulation of automobile, pedestrian, and rail traffic coupled to new applications, such as the embedding of traffic simulation into driving simulators, to give a more realistic environment of driver behavior surrounding the subject vehicle. New approaches to traffic simulation are described, including the hybrid mesoscopic-microscopic model and floor-field agent-based simulation. Written by an invited panel of experts, this book addresses students, engineers, and scholars, as well as anyone who needs a state-of-the-art overview of transport simulation today.

Geospatial Data Science Techniques and Applications - Hassan A. Karimi 2017-10-24

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.