

Predictive Analytics With Matlab Mathworks

Making sense of sports performance data can be a challenging task but is nevertheless an essential part of performance analysis investigations. Focusing on techniques used in the analysis of sport performance, this book introduces the fundamental principles of data analysis, explores the most important tools used in data analysis, and offers guidance on the presentation of results. The book covers key topics such as: The purpose of data analysis, from statistical analysis to algorithmic processing Commercial packages for performance and data analysis, including Focus, Sportscode, Dartfish, Prozone, Excel, SPSS and Matlab Effective use of statistical procedures in sport performance analysis Analysing data from manual notation systems, player tracking systems and computerized match analysis systems Creating visually appealing 'dashboard' interfaces for presenting data Assessing reliability. The book includes worked examples from real sport, offering clear guidance to the reader and bringing the subject to life. This book is invaluable reading for any student, researcher or analyst working in sport performance or undertaking a sport-related research project or methods course

This book presents a compilation of selected papers from the 17th IEEE International Conference on Machine Learning and Applications (IEEE ICMLA 2018), focusing on use of deep learning technology in application like game playing, medical applications, video analytics, regression/classification, object detection/recognition and robotic control in industrial environments. It highlights novel ways of using deep neural networks to solve real-world problems, and also offers insights into deep learning architectures and algorithms, making it an essential reference guide for academic researchers, professionals, software engineers in industry, and innovative product developers.

Intelligent Data-Analytics for Condition Monitoring: Smart Grid Applications looks at intelligent and meaningful uses of data required for an optimized, efficient engineering processes. In addition, the book provides application perspectives of various deep learning models for the condition monitoring of electrical equipment. With chapters discussing the fundamentals of machine learning and data analytics, the book is divided into two parts, including i) The application of intelligent data analytics in Solar PV fault diagnostics, transformer health monitoring and faults diagnostics, and induction motor faults and ii) Forecasting issues using data analytics which looks at global solar radiation forecasting, wind data forecasting, and more. This reference is useful for all engineers and researchers who need preliminary knowledge on data analytics fundamentals and the working methodologies and architecture of smart grid systems. Features deep learning methodologies in smart grid deployment and maintenance applications Includes coding for intelligent data analytics for each application Covers advanced problems and solutions of smart grids using advance data analytic techniques

Computational Mathematics: Models, Methods, and Analysis with MATLAB and MPI explores and illustrates this process. Each section of the first six chapters is motivated by a specific application. The author applies a model, selects a numerical method, implements computer simulations, and assesses the ensuing results. These chapters include an abundance of MATLAB code. By studying the code instead of using it as a "black box," you take the first step toward more sophisticated numerical modeling. The last four chapters focus on multiprocessing algorithms implemented using message passing interface (MPI). These chapters include Fortran 9x codes that illustrate the basic MPI subroutines and revisit the applications of the previous chapters from a parallel implementation perspective. All of the codes are available for download from www4.ncsu.edu/~white. This book is not just about math, not just about computing, and not just about applications, but about all three--in other words, computational science. Whether used as an undergraduate textbook, for self-study, or for reference, it builds the foundation you need to make numerical modeling and simulation integral parts of your investigational toolbox.

Exploratory Data Analysis with MATLAB

Practical Image and Video Processing Using MATLAB

Introduction to Scientific Computing, Data Analysis, and Data Visualization

Intelligent Data-Analytics for Condition Monitoring

Deep Learning Applications

Using Data Mining for Business Advantage

Data-driven dynamical systems is a burgeoning field?it connects how measurements of nonlinear dynamical systems and/or complex systems can be used with well-established methods in dynamical systems theory. This is a critically important new direction because the governing equations of many problems under consideration by practitioners in various scientific fields are not typically known. Thus, using data alone to help derive, in an optimal sense, the best dynamical system representation of a given application allows for important new insights. The recently developed dynamic mode decomposition (DMD) is an innovative tool for integrating data with dynamical systems theory. The DMD has deep connections with traditional dynamical systems theory and many recent innovations in compressed sensing and machine learning. Dynamic Mode Decomposition: Data-Driven Modeling of Complex Systems, the first book to address the DMD algorithm, presents a pedagogical and comprehensive approach to all aspects of DMD currently developed or under development; blends theoretical development, example codes, and applications to showcase the theory and its many innovations and uses; highlights the numerous innovations around the DMD algorithm and demonstrates its efficacy using example problems from engineering and the physical and biological sciences; and provides extensive MATLAB code, data for intuitive examples of key methods, and graphical presentations.

This book offers the first comprehensive and practice-oriented guide to condition monitoring algorithms in MATLAB®. After a concise introduction to vibration theory and signal processing techniques, the attention is moved to the algorithms. Each signal processing algorithm is presented in depth, from the theory to the application, and including extensive explanations on how to use the corresponding toolbox in MATLAB®. In turn, the book introduces various techniques for synthetic signals generation, as well as vibration-based analysis techniques for large data sets. A practical guide on how to directly access data from industrial condition monitoring systems (CMS) using MATLAB® .NET Libraries is also included. Bridging between research and practice, this book offers an extensive guide on condition monitoring algorithms to both scholars and professionals. "Condition Monitoring Algorithms in MATLAB® is a great resource for anyone in the field of condition monitoring. It is a unique as it presents the theory, and a number of examples in Matlab®, which greatly improve the learning experience. It offers numerous examples of coding styles in Matlab, thus supporting graduate students and professionals writing their own codes." Dr. Eric Bechhoefer Founder and CEO of GPMS Developer of the Foresight MX Health and Usage Monitoring System

Introduction to Mechanism Design: with Computer Applications provides an updated approach to undergraduate Mechanism Design and Kinematics courses/modules for engineering students. The use of web-based simulations, solid modeling, and software such as MATLAB and Excel is employed to link the design process with the latest software tools for the design and analysis of mechanisms and machines. While a mechanical engineer might brainstorm with a pencil and sketch pad, the final result is developed and communicated through CAD and computational visualizations. This modern approach to mechanical design processes has not been fully integrated in most books, as it is in this new text.

Group method of data handling (GMDH) is a typical inductive modeling method built on the principles of self-organization. Since its introduction, inductive modelling has been developed to support complex systems in prediction, clusterization, system identification, as well as data mining and knowledge extraction technologies in social science, science, engineering, and medicine. This is the first book to explore GMDH using MATLAB (matrix laboratory) language. Readers will learn how to implement GMDH in MATLAB as a method of dealing with big data analytics. Error-free source codes in MATLAB have been included in supplementary material (accessible online) to assist users in their understanding in GMDH and to make it easy for users to further develop variations of GMDH algorithms. Contents:Basic/Standard GMDH:Introduction (Godfrey C Onwubolu)GMDH Multilayered Algorithm (Godfrey C Onwubolu)GMDH Multilayered Algorithm in MATLAB (Mohammed Abdalla Ayoub Mohammed)Hybrid GMDH System:GMDH-Based Polynomial Neural Network Algorithm in MATLAB (Elaine Inácio Bueno, Iraci Martinez Pereira and Antonio Teixeira e Silva)Designing GMDH Model Using Modified Levenberg Marquardt Technique in Matlab (Maryam Pournasir Roudbaneh)Group Method of Data Handling Using Discrete Differential Evolution in Matlab (Donald Davendra, Godfrey Onwubolu and Ivan Zelinka) Readership: Professionals and students interested in data mining and analytics.

Understanding LTE with MATLAB

Artificial Intelligence Programming with Python

Digital Signal Processing Using MATLAB

Computational Statistics Handbook with MATLAB

Dynamic Mode Decomposition

Integration of Omics Approaches and Systems Biology for Clinical Applications

An introduction to technical details related to the PhysicalLayer of the LTE standard with MATLAB® The LTE (Long Term Evolution) and LTE-Advanced are among the latest mobile communications standards, designed to realize the dream of a truly global, fast, all-IP-based, secure broadband mobile access technology. This book examines the Physical Layer (PHY) of the LTE standards by incorporating three conceptual elements: an overview of the theory behind key enabling technologies; a concise discussion regarding standard specifications; and the MATLAB® algorithms needed to simulate the standard. The use of MATLAB®, a widely used technical computing language, is one of the distinguishing features of this book. Through a series of MATLAB® programs, the author explores each of the enabling technologies, pedagogically synthesizes an LTE PHY system model, and evaluates system performance at each stage. Following this step-by-step process, readers will achieve deeper understanding of LTE concepts and specifications through simulations. Key Features: • Accessible, intuitive, and progressive; one of the few books to focus primarily on the modeling, simulation, and implementation of the LTE PHY standard • Includes case studies and test benches in MATLAB®, which build knowledge gradually and incrementally until a functional specification for the LTE PHY is attained • Accompanying Web site includes all MATLAB® programs, together with PowerPoint slides and other illustrative examples Dr Houman Zarrinkoub has served as a development manager and now as a senior product manager with MathWorks, based in Massachusetts, USA. Within his 12 years at MathWorks, he has been responsible for multiple signal processing and communications software tools. Prior to MathWorks, he was a research scientist in the Wireless Group at Nertel Networks, where he contributed to multiple standardization projects for 3G mobile technologies. He has been awarded multiple patents on topics related to computer simulations. He holds a BSc degree in Electrical Engineering from McGill University and MSc and PhD degrees in Telecommunications from the Institut Nationale de la Recherche Scientifique, in Canada. <http://www.wiley.com/go/zarrinkoub> www.wiley.com/go/zarrinkoub

A hands-on roadmap to using Python for artificial intelligence programming In Practical Artificial Intelligence Programming with Python: From Zero to Hero, veteran educator and photophysicist Dr. Perry Xiao delivers a thorough introduction to one of the most exciting areas of computer science in modern history. The book demystifies artificial intelligence and teaches readers its fundamentals from scratch in simple and plain language and with illustrative code examples. Divided into three parts, the author explains artificial intelligence generally, machine learning, and deep learning. It tackles a wide variety of useful topics, from classification and regression in machine learning to generative adversarial networks. He also includes: Fulsome introductions to MATLAB, Python, AI, machine learning, and deep learning Expansive discussions on supervised and unsupervised machine learning, as well as semi-supervised learning Practical AI and Python "cheat sheet" quick references This hands-on AI programming guide is perfect for anyone with a basic knowledge of programming—including familiarity with variables, arrays, loops, if-else statements, and file input and output—who seeks to understand foundational concepts in AI and AI development.

Harness the power of MATLAB to resolve a wide range of machine learning challenges. This book provides a series of examples of technologies critical to machine learning. Each example solves a real-world problem. All code in MATLAB Machine Learning Recipes: A Problem-Solution Approach is executable. The toolbox that the code uses provides a complete set of functions needed to implement all aspects of machine learning. Authors Michael Paluszek and Stephanie Thomas show how all of these technologies allow the reader to build sophisticated applications to solve problems with pattern recognition, autonomous driving, expert systems, and much more. What you'll learn: How to write code for machine learning, adaptive control and estimation using MATLAB How these three areas complement each other How these three areas are needed for robust machine learning applications How to use MATLAB graphics and visualization tools for machine learning How to code real world examples in MATLAB for major applications of machine learning in big data

Who is this book for: The primary audiences are engineers, data scientists and students wanting a comprehensive and code cookbook rich in examples on machine learning using MATLAB. The guide to targeting and leveraging business opportunities using big data & analytics By leveraging big data & analytics, businesses create the potential to better understand, manage, and strategically exploiting the complex dynamics of customer behavior. Analytics in a Big Data World reveals how to tap into the powerful tool of data analytics to create a strategic advantage and identify new business opportunities.

Designed to be an accessible resource, this essential book does not include exhaustive coverage of all analytical techniques, instead focusing on analytics techniques that really provide added value in business environments. The book draws on author Bart Baesens' expertise on the topics of big data, analytics and its applications in e.g. credit risk, marketing, and fraud to provide a clear roadmap for organizations that want to use data analytics to their advantage, but need a good starting point. Baesens has conducted extensive research on big data, analytics, customer relationship management, web analytics, fraud detection, and credit risk management, and uses this experience to bring clarity to a complex topic. Includes numerous case studies on risk management, fraud detection, customer relationship management, and web analytics Offers the results of research and the author's personal experience in banking, retail, and government Contains an overview of the visionary ideas and current developments on the strategic use of analytics for business Covers the topic of data analytics in easy-to-understand terms without an undue emphasis on mathematics and the minutiae of statistical analysis For organizations looking to enhance their capabilities via data analytics, this resource is the go-to reference for leveraging data to enhance business capabilities.

Digital Signal Processing Using MATLAB for Students and Researchers

Quantitative Asset Management

Data-Driven Science and Engineering

Modeling and Simulation of Systems Using MATLAB and Simulink

MATLAB for Machine Learning

Revised Reprint

This book is about predictive analytics. Yet, each chapter could easily be handled by an entire volume of its own. So one might think of this as a survey of predictive modeling. A predictive model is a statistical model or machine learning model used to predict future behavior based on past behavior. In order to use this book, one should have a basic understanding of mathematical statistics - it is an advanced book. Some theoretical foundations are laid out but not proven, but references are provided for additional coverage. Every chapter culminates in an example using R. R is a free software environment for statistical computing and graphics. You may download R, from a preferred CRAN mirror at <http://www.r-project.org/>. The book is organized so that statistical models are presented first (hopefully in a logical order), followed by machine learning models, and then applications: uplift modeling and time series. One could use this textbook with problem solving in R-but there are no "by-hand" exercises.

MATLAB is a powerful data analysis program, but many behavioral science researchers find it too daunting to learn and use. An Introduction to MATLAB for Behavioral Researchers by Christopher R. Madan is an easy-to-understand, hands-on guide for behavioral researchers who have no prior programming experience. Written in a conversational and non-intimidating style, the author walks students—step by step—through analyzing real experimental data. Topics covered include the basics of programming, the implementation of simple behavioral analyses, and how to make publication-ready figures. More advanced topics such as pseudo-randomization of trial sequences to meet specified criteria and working with psycholinguistic data are also covered. Interesting behavioral science examples and datasets from published studies, such as visualizing fixation patterns in eye-tracking studies and animal search behavior in two-dimensional space, help develop an intuition for data analysis, which is essential and can only be developed when working with real research problems and real data.

This supplement to any standard DSP text is one of the first books to successfully integrate the use of MATLAB® in the study of DSP concepts. In this book, MATLAB® is used as a computing tool to explore traditional DSP topics, and solve problems to gain insight. This greatly expands the range and complexity of problems that students can effectively study in the course. Since DSP applications are primarily algorithms implemented on a DSP processor or software, a fair amount of programming is required. Using interactive software such as MATLAB® makes it possible to place more emphasis on learning new and difficult concepts than on programming algorithms. Interesting practical examples are discussed and useful problems are explored. This updated second edition includes new homework problems and revises the scripts in the book, available functions, and m-files to MATLAB® V7.

Green Computing and Predictive Analytics for Healthcare excavates the rudimentary concepts of Green Computing, Big Data and the Internet of Things along with the latest research development in the domain of healthcare. It also covers various applications and case studies in the field of computer science with state-of-the-art tools and technologies. The rapid growth of the population is a challenging issue in maintaining and monitoring various experiences of quality of service in healthcare. The coherent usage of these limited resources in connection with optimum energy consumption has been becoming more important. The major healthcare nodes are gradually becoming Internet of Things-enabled, and sensors, work data and the involvement of networking are creating smart campuses and smart houses. The book includes chapters on the Internet of Things and Big Data technologies. Features: Biomedical data monitoring under the Internet of Things Environment data sensing and analyzing Big data analytics and clustering Machine learning techniques for sudden cardiac death prediction Robust brain tissue segmentation Energy-efficient and green Internet of Things for healthcare applications Blockchain technology for the healthcare Internet of Things Advanced healthcare for domestic medical tourism system Edge computing for data analytics This book on Green Computing and Predictive Analytics for Healthcare aims to promote and facilitate the exchange of research knowledge and findings across different disciplines on the design and investigation of healthcare data analytics. It can also be used as a textbook for a master's course in biomedical engineering. This book will also present new methods for medical data evaluation and the diagnosis of different diseases to improve quality-of-life in general and for better integration of Internet of Things into society. Dr. Sourav Banerjee is an Assistant Professor at the Department of Computer Science and Engineering of Kalyani Government Engineering College, Kalyani, West Bengal, India. His research interests include Big Data, Cloud Computing, Distributed Computing and Mobile Communications. Dr. Chinmay Chakraborty is an Assistant Professor at the Department of Electronics and Communication Engineering, Birla Institute of Technology, Mesra, India. His main research interests include the Internet of Medical Things, WBAN, Wireless Networks, Telemedicine, m-Health/e-Health and Medical Imaging. Dr. Kousik Dasgupta is an Assistant Professor at the Department of Computer Science and Engineering, Kalyani Government Engineering College, India. His research interests include Computer Vision, AI/ML, Cloud Computing, Big Data and Security.

with Computer Applications

Measurement, Data Analysis, and Sensor Fundamentals for Engineering and Science

An Introduction to MATLAB for Behavioral Researchers

Green Computing and Predictive Analytics for Healthcare

Introduction to Mechanism Design

Matlab: Data Analysis And Visualization

The challenges of the current financial environment have revealed the need for a new generation of professionals who combine training in traditional finance disciplines with an understanding of sophisticated quantitative and analytical tools. Risk Management and Simulation shows how simulation modeling and analysis can help you solve risk management problems related to market, credit, operational, business, and strategic risk. Simulation models and methodologies offer an effective way to address many of these problems and are easy for finance professionals to understand and use. Drawing on the author's extensive teaching experience, this accessible book walks you through the concepts, models, and computational techniques. How Simulation Models Can Help You Manage Risk More Effectively Organized into four parts, the book begins with the concepts and framework for risk management. It then introduces the modeling and computational techniques for solving risk management problems, from model development, verification, and validation to designing simulation experiments and conducting appropriate output analysis. The third part of the book delves into specific issues of risk management in a range of risk types. These include market risk, equity risk, interest rate risk, commodity risk, currency risk, credit risk, liquidity risk, and strategic, business, and operational risks. The author also examines insurance as a mechanism for risk management and risk transfer. The final part of the book explores advanced concepts and techniques. The book contains extensive review questions and detailed quantitative or computational exercises in all chapters. Use of MATLAB® mathematical software is encouraged and suggestions for MATLAB functions are provided throughout. Learn Step by Step, From Basic Concepts to More Complex Models Packed with applied examples and exercises, this book builds from elementary models for risk to more sophisticated, dynamic models for risks that evolve over time. A comprehensive introduction to simulation modeling and analysis for risk management, it gives you the tools to better assess and manage the impact of risk in your organizations. The book can also serve as a support reference for readers preparing for CFA exams, GARP FRM exams, PRMIA PRM exams, and actuarial exams.

Data-driven discovery is revolutionizing the modeling, prediction, and control of complex systems. This textbook brings together machine learning, engineering mathematics, and mathematical physics to integrate modeling and control of dynamical systems with modern methods in data science. It highlights many of the recent advances in scientific computing that enable data-driven methods to be applied to a diverse range of complex systems, such as turbulence, the brain, climate, epidemiology, finance, robotics, and autonomy. Aimed at advanced undergraduate and beginning graduate students in the engineering and physical sciences, the text presents a range of topics and methods from introductory to state of the art.

Computational Learning Approaches to Data Analytics in Biomedical Applications provides a unified framework for biomedical data analysis using varied machine learning and statistical techniques. It presents insights on biomedical data processing, innovative clustering algorithms and techniques, and connections between statistical analysis and clustering. The book introduces and discusses the major problems relating to data analytics, provides a review of influential and state-of-the-art learning algorithms for biomedical applications, reviews cluster validity indices and how to select the appropriate index, and includes an overview of statistical methods that can be applied to increase confidence in the clustering framework and analysis of the results obtained. Includes an overview of data analytics in biomedical applications and current challenges Updates on the latest research in supervised learning algorithms and applications, clustering algorithms and cluster validation indices Provides complete coverage of computational and statistical analysis tools for biomedical data analysis Presents hands-on training on the use of Python libraries, MATLAB® tools, WEKA, SAP-HANA and R/Bioconductor

Extract patterns and knowledge from your data in easy way using MATLAB About This Book Get your first steps into machine learning with the help of this easy-to-follow guide Learn regression, clustering, classification, predictive analytics, artificial neural networks and more with MATLAB Understand how your data works and identify hidden layers in the data with the power of machine learning. Who This Book Is For This book is for data analysts, data scientists, students, or anyone who is looking to get started with machine learning and want to build efficient data processing and predicting applications. A mathematical and statistical background will really help in following this book well. What You Will Learn Learn the introductory concepts of machine learning. Discover different ways to transform data using SAS XPORT, import and export tools, Explore the different types of regression techniques such as simple & multiple linear regression, ordinary least squares estimation, correlations and how to apply them to your data. Discover the basics of classification methods and how to implement Naive Bayes algorithm and Decision Trees in the Matlab environment. Uncover how to use clustering methods like hierarchical clustering to grouping data using the similarity measures. Know how to perform data fitting, pattern recognition, and clustering analysis with the help of MATLAB Neural Network Toolbox. Learn feature selection and extraction for dimensionality reduction leading to improved performance. In Detail MATLAB is the language of choice for many researchers and mathematics experts for machine learning. This book will help you build a foundation in machine learning using MATLAB for beginners. You'll start by getting your system ready with the MATLAB environment for machine learning and you'll see how to easily interact with the Matlab workspace. We'll then move on to data cleansing, mining and analyzing various data types in machine learning and you'll see how to display data values on a plot. Next, you'll get to know about the different types of regression techniques and how to apply them to your data using the MATLAB functions. You'll understand the basic concepts of neural networks and perform data fitting, pattern recognition, and clustering analysis. Finally, you'll explore feature selection and extraction techniques for dimensionality reduction for performance improvement. At the end of the book, you will learn to put it all together into real-world cases covering major machine learning algorithms and be comfortable in performing machine learning with MATLAB. Style and approach The book takes a very comprehensive approach to enhance your understanding of machine learning using MATLAB. Sufficient real-world examples and use cases are included in the book to help you grasp the concepts quickly and apply them easily in your day-to-day work.

Feature Engineering for Machine Learning and Data Analytics

MATLAB Simulations for Radar Systems Design

Compressive Sampling and Learning Algorithms for Rotating Machines

Models, Methods, and Analysis with MATLAB and MPI

Condition Monitoring Algorithms in MATLAB®

GMDH-Methodology and Implementation in MATLAB

Learn the fundamental aspects of the business statistics, data mining, and machine learning techniques required to understand the huge amount of data generated by your organization. This book explains practical business analytics through examples, covers the steps involved in using it correctly, and shows you the context in which a particular technique does not make sense. Further, Practical Business Analytics using R helps you understand specific issues faced by organizations and how the solutions to these issues can be facilitated by business analytics. This book will discuss and explore the following through examples and case studies: An introduction to R: data management and R functions The architecture, framework, and life cycle of a business analytics project Descriptive analytics using R: descriptive statistics and data cleaning Data mining: classification, association rules, and clustering Predictive analytics: simple regression, multiple regression, and logistic regression This book includes case studies on important business analytic techniques, such as classification, association, clustering, and regression. The R language is the statistical tool used to demonstrate the concepts throughout the book. What You Will Learn • Write R programs to handle data • Build analytical models and draw useful inferences from them • Discover the basic concepts of data mining and machine learning • Carry out predictive modeling • Define a business issue as an analytical problem Who This Book Is For Beginners who want to understand and learn the fundamentals of analytics using R. Students, managers, executives, strategy and planning professionals, software professionals, and BI/DW professionals.

Artificial Intelligence (AI), when incorporated with machine learning and deep learning algorithms, has a wide variety of applications today. This book focuses on the implementation of various elementary and advanced approaches in AI that can be used in various domains to solve real-time decision-making problems. The book focuses on concepts and techniques used to run tasks in an automated manner. It discusses computational intelligence in the detection and diagnosis of clinical and biomedical images, covers the automation of a system through machine learning and deep learning approaches, presents data analytics and mining for decision-support applications, and includes case-based reasoning, natural language processing, computer vision, and AI approaches in real-time applications. Academic scientists, researchers, and students in the various domains of computer science engineering, electronics and communication engineering, and information technology, as well as industrial engineers, biomedical engineers, and management, will find this book useful. By the end of this book, you will understand the fundamentals of AI. Various case studies will develop your adaptive thinking to solve real-time AI problems. Features Includes AI-based decision-making approaches Discusses computational intelligence in the detection and diagnosis of clinical and biomedical images Covers automation of systems through machine learning and deep learning approaches and its implications to the real world Presents data analytics and mining for decision-support applications Offers case-based reasoning

Not only do modeling and simulation help provide a better understanding of how real-world systems function, they also enable us to predict system behavior before a system is actually built and analyze systems accurately under varying operating conditions. Modeling and Simulation of Systems Using MATLAB® and Simulink® provides comprehensive, state-of-the-art coverage of all the important aspects of modeling and simulating both physical and conceptual systems. Various real-life examples show how simulation plays a key role in understanding real-world systems. The author also explains how to effectively use MATLAB and Simulink software to successfully apply the modeling and simulation techniques presented. After introducing the underlying philosophy of systems, the book offers step-by-step procedures for modeling different types of systems using modeling techniques, such as the graph-theoretic approach, interpretive structural modeling, and system dynamics modeling. It then explores how simulation evolved from pre-computer days into the current science of today. The text also presents modern soft computing techniques, including artificial neural networks, fuzzy systems, and genetic algorithms, for modeling and simulating complex and nonlinear systems. The final chapter addresses discrete systems modeling. Preparing both undergraduate and graduate students for advanced modeling and simulation courses, this text helps them carry out effective simulation studies. In addition, graduate students should be able to comprehend and conduct simulation research after completing this book.

Simulation is integral to the successful design of modern radar systems, and there is arguably no better software for this purpose than MATLAB. But software and the ability to use it does not guarantee success. One must also: Understand radar operations and design philosophy Know how to select the radar parameters to meet the design req

Risk Management and Simulation

Smart Grid Applications

Machine Learning, Dynamical Systems, and Control

Predictive Analytics for Marketers

Artificial Intelligence Trends for Data Analytics Using Machine Learning and Deep Learning Approaches

Fundamentals of Data Science with MATLAB

Introduces readers to the state of the art of omics platforms and all aspects of omics approaches for clinical applications This book presents different high throughput omics platforms used to analyze tissue, plasma, and urine. The reader is introduced to state of the art analytical approaches (sample preparation and instrumentation) related to proteomics, peptidomics, transcriptomics, and metabolomics. In addition, the book highlights innovative approaches using bioinformatics, urine miRNAs, and MALDI tissue imaging in the context of clinical applications. Particular emphasis is put on integration of data generated from these different platforms in order to uncover the molecular landscape of diseases. The relevance of each approach to the clinical setting is explained and future applications for patient monitoring or treatment are discussed. Integration of omics Approaches and Systems Biology for Clinical Applications presents an overview of state of the art omics techniques. These methods are employed in order to obtain the comprehensive molecular profile of biological specimens. In addition, computational tools are used for organizing and integrating these multi-source data towards developing molecular models that reflect the pathophysiology of diseases. Investigation of chronic kidney disease (CKD) and bladder cancer are used as test cases. These represent multi-factorial, highly heterogeneous diseases, and are among the most significant health issues in developed countries with a rapidly aging population. The book presents novel insights on CKD and bladder cancer obtained by omics data integration as an example of the application of systems biology in the clinical setting. Describes a range of state of the art omics analytical platforms Covers all aspects of the systems biology approach—from sample preparation to data integration and bioinformatics analysis Contains specific examples of omics methods applied in the investigation of human diseases (Chronic Kidney Disease, Bladder Cancer) Integration of omics Approaches and Systems Biology for Clinical Applications will appeal to a wide spectrum of scientists including biologists, biotechnologists, biochemists, biophysicists, and bioinformaticians working on the different molecular platforms. It is also an excellent text for students interested in these fields.

Steven Chapra's second edition, Applied Numerical Methods with MATLAB for Engineers and Scientists, is written for engineers and scientists who want to learn numerical problem solving. This text focuses on problem-solving (applications) rather than theory, using MATLAB, and is intended for Numerical Methods users; hence theory is included only to inform key concepts. The second edition feature new material such as Numerical Differentiation and ODE's: Boundary-Value Problems. For those who require a more theoretical approach, see Chapra's best-selling Numerical Methods for Engineers, 5/e (2006), also by McGraw-Hill.

This book highlights state-of-the-art research on big data and the Internet of Things (IoT), along with related areas to ensure efficient and Internet-compatible IoT systems. It not only discusses big data security and privacy challenges, but also energy-efficient approaches to improving virtual machine placement in cloud computing environments. Big data and the Internet of Things (IoT) are ultimately two sides of the same coin, yet extracting, analyzing and managing IoT data poses a serious challenge. Accordingly, proper analytics infrastructures/platforms should be used to analyze IoT data.

Information technology (IT) allows people to upload, retrieve, store and collect information, which ultimately forms big data. The use of big data analytics has grown tremendously in just the past few years. At the same time, the IoT has entered the public consciousness, sparking people's imaginations as to what a fully connected world can offer. Further, the book discusses the analysis of real-time big data to derive actionable intelligence in enterprise applications in several domains, such as in industry and agriculture. It explores possible automated solutions in daily life, including structures for smart cities and automated home systems based on IoT technology, as well as health care systems that manage large amounts of data (big data) to improve clinical decisions. The book addresses the security and privacy of the IoT and big data technologies, while also revealing the impact of IoT technologies on several scenarios in smart cities design. Intended as a comprehensive introduction, it offers in-depth analysis and provides scientists, engineers and professionals the latest techniques, frameworks and strategies used in IoT and big data technologies.

As with the bestselling first edition, Computational Statistics Handbook with MATLAB, Second Edition covers some of the most commonly used contemporary techniques in computational statistics. With a strong, practical focus on implementing the methods, the authors include algorithmic descriptions of the procedures as well as

From Zero to Hero

Analytics in a Big Data World

Computational Mathematics

Data-Driven Modeling of Complex Systems

Data Analysis in Sport

Applied Numerical Methods with MATLAB for Engineers and Scientists

Predictive analytics has revolutionized marketing practice. It involves using many techniques from data mining, statistics, modelling, machine learning and artificial intelligence, to analyse current data and make predictions about unknown future events. In business terms, this enables companies to forecast consumer behaviour and much more. Predictive Analytics for Marketers will guide marketing professionals on how to apply predictive analytical tools to streamline business practices. Including comprehensive coverage of an array of predictive analytic tools and techniques, this book enables readers to harness patterns from past data, to make accurate and useful predictions that can be converted to business success. Truly global in its approach, the insights these techniques offer can be used to manage resources more effectively across all industries and sectors. Written in clear, non-technical language, Predictive Analytics for Marketers contains case studies from the author's more than 25 years of experience and articles from guest contributors, demonstrating how predictive analytics has been used to successfully achieve a range of business purposes.

Feature engineering plays a vital role in big data analytics. Machine learning and data mining algorithms cannot work without data. Little can be achieved if there are few features to represent the underlying data objects, and the quality of results of those algorithms largely depends on the quality of the available features. Feature Engineering for Machine Learning and Data Analytics provides a comprehensive introduction to feature engineering, including feature generation, feature extraction, feature transformation, feature selection, and feature analysis and evaluation. The book presents key concepts, methods, examples, and applications, as well as chapters on feature engineering for major data types such as texts, images, sequences, time series, graphs, streaming data, software engineering data, Twitter data, and social media data. It also contains generic feature generation approaches, as well as methods for generating tried-and-tested, hand-crafted, domain-specific features. The first chapter defines the concepts of features and feature engineering, offers an overview of the book, and provides pointers to topics not covered in this book. The next six chapters are devoted to feature engineering, including feature generation for specific data types. The subsequent four chapters cover generic approaches for feature engineering, namely feature selection, feature transformation based feature engineering, deep learning based feature engineering, and pattern based feature generation and engineering. The last three chapters discuss feature engineering for social bot detection, software management, and Twitter-based applications respectively. This book can be used as a reference for data analysts, big data scientists, data preprocessing workers, project managers, project developers, prediction modelers, professors, researchers, graduate students, and upper level undergraduate students. It can also be used as the primary text for courses on feature engineering, or as a supplement for courses on machine learning, data mining, and big data analytics.

Quickly Engages in Applying Algorithmic Techniques to Solve Practical Signal Processing Problems With its active, hands-on learning approach, this text enables readers to master the underlying principles of digital signal processing and its many applications in industries such as digital television, mobile and broadband communications, and medical/scientific devices. Carefully developed MATLAB® examples throughout the text illustrate the mathematical concepts and use of digital signal processing algorithms. Readers will develop a deeper understanding of how to apply the algorithms by manipulating the codes in the examples to see their effect. Moreover, plenty of exercises help to put knowledge into practice solving real-world signal processing challenges. Following an introductory chapter, the text explores: Sampled signals and digital processing Random signals Representing signals and systems Temporal and spatial signal processing Frequency analysis of signals Discrete-time filters and recursive filters Each chapter begins with chapter objectives and an introduction. A summary at the end of each chapter ensures that one has mastered all the key concepts and techniques before progressing in the text. Lastly, appendices listing selected web resources, research papers, and related textbooks enable the investigation of individual topics in greater depth. Upon completion of this text, readers will understand how to apply key algorithmic techniques to address practical signal processing problems as well as develop their own signal processing algorithms. Moreover, the text provides a solid foundation for evaluating and applying new digital processing signal techniques as they are developed.

Provides an extensive, up-to-date treatment of techniques used for machine condition monitoring Clear and concise throughout, this accessible book is the first to be wholly devoted to the field of condition monitoring for rotating machines using vibration signals. It covers various feature extraction, feature selection, and classification methods as well as their applications to machine vibration datasets. It also presents new methods including machine learning and compressive sampling, which help to improve safety, reliability, and performance. Condition Monitoring with Vibration Signals: Compressive Sampling and Learning Algorithms for Rotating Machines starts by introducing readers to Vibration Analysis Techniques and Machine Condition Monitoring (MCM). It then offers readers sections covering: Rotating Machine Condition Monitoring using Learning Algorithms; Classification Algorithms; and New Fault Diagnosis Frameworks designed for MCM. Readers will learn signal processing in the time-frequency domain, methods for linear subspace learning, and the basic principles of the learning method Artificial Neural Network (ANN). They will also discover recent trends of deep learning in the field of machine condition monitoring, new feature learning frameworks based on compressive sampling, subspace learning techniques for machine condition monitoring, and much more. Covers the fundamental as well as the state-of-the-art approaches to machine condition monitoringguiding readers from the basics of rotating machines to the generation of knowledge using vibration signals Provides new methods, including machine learning and compressive sampling, which offer significant improvements in accuracy with reduced computational costs Features learning algorithms that can be used for fault diagnosis and prognosis Includes previously and recently developed dimensionality reduction techniques and classification algorithms Condition Monitoring with Vibration Signals: Compressive Sampling and Learning Algorithms for Rotating Machines is an excellent book for research students, postgraduate students, industrial practitioners, and researchers.

Predictive Analytics using R

Business Analytics Using R - A Practical Approach

From Mathematical Modeling to Simulation and Prototyping

Condition Monitoring with Vibration Signals

The Essential Guide to Data Science and its Applications

Praise for the Second Edition: "The authors present an intuitive and easy-to-read book. ... accompanied by many examples, proposed exercises, good references, and comprehensive appendices that initiate the reader unfamiliar with MATLAB."—Adolfo Alvarez Pinto, *International Statistical Review* "Practitioners of EDA who use MATLAB will want a copy of this book. ... The authors have done a great service by bringing together so many EDA routines, but their main accomplishment in this dynamic text is providing the understanding and tools to do EDA. —David A Huckaby, *MAA Reviews Exploratory Data Analysis (EDA) is an important part of the data analysis process. The methods presented in this text are ones that should be in the toolkit of every data scientist. As computational sophistication has increased and data sets have grown in size and complexity, EDA has become an even more important process for visualizing and summarizing data before making assumptions to generate hypotheses and models. Exploratory Data Analysis with MATLAB, Third Edition presents EDA methods from a computational perspective and uses numerous examples and applications to show how the methods are used in practice. The authors use MATLAB code, pseudo-code, and algorithm descriptions to illustrate the concepts. The MATLAB code for examples, data sets, and the EDA Toolbox are available for download on the book's website. New to the Third Edition Random projections and estimating local intrinsic dimensionality Deep learning autoencoders and stochastic neighbor embedding Minimum spanning tree and additional cluster validity indices Kernel density estimation Plots for visualizing data distributions, such as beanplots and violin plots A chapter on visualizing categorical data*

Matlab: Data Analysis And VisualizationWorld Scientific Publishing Company

A combination of two texts authored by Patrick Dunn, this set covers sensor technology as well as basic measurement and data analysis subjects, a combination not covered together in other references. Written for junior-level mechanical and aerospace engineering students, the topic coverage allows for flexible approaches to using the combination book in courses. MATLAB® applications are included in all sections of the combination, and concise, applied coverage of sensor technology is offered.

Numerous chapter examples and problems are included, with complete solutions available.

A revised textbook for introductory courses in numerical methods, MATLAB and technical computing, which emphasises the use of mathematical software.

A Problem-Solution Approach

Numerical Computing with MATLAB

Computational Learning Approaches to Data Analytics in Biomedical Applications

Internet of Things and Big Data Analytics Toward Next-Generation Intelligence

Foundations of Computational Finance with MATLAB

MATLAB Machine Learning Recipes

UP-TO-DATE, TECHNICALLY ACCURATE COVERAGE OF ESSENTIAL TOPICS IN IMAGE AND VIDEO PROCESSING This is the first book to combine image and video processing with a practical MATLAB®-oriented approach in order to demonstrate the most important image and video techniques and algorithms. Utilizing minimal math, the contents are presented in a clear, objective manner, emphasizing and encouraging experimentation. The book has been organized into two parts. Part I: Image Processing begins with an overview of the field, then introduces the fundamental concepts, notation, and terminology associated with image representation and basic image processing operations. Next, it discusses MATLAB® and its Image Processing Toolbox with the start of a series of chapters with hands-on activities and step-by-step tutorials. These chapters cover image acquisition and digitization; arithmetic, logic, and geometric operations; point-based, histogram-based, and neighborhood-based image enhancement techniques; the Fourier Transform and relevant frequency-domain image filtering techniques; image restoration; mathematical morphology; edge detection techniques; image segmentation; image compression and coding; and feature extraction and representation. Part II: Video Processing presents the main concepts and terminology associated with analog video signals and systems, as well as digital video formats and standards. It then describes the technically involved problem of standards conversion, discusses motion estimation and compensation techniques, shows how video sequences can be filtered, and concludes with an example of a solution to object detection and tracking in video sequences using MATLAB®. Extra features of this book include: More than 30 MATLAB® tutorials, which consist of step-by-step guides to exploring image and video processing techniques using MATLAB® Chapters supported by figures, examples, illustrative problems, and exercises Useful websites and an extensive list of bibliographical references This accessible text is ideal for upper-level undergraduate and graduate students in digital image and video processing courses, as well as for engineers, researchers, software developers, practitioners, and anyone who wishes to learn about these increasingly popular topics on their own.

MATLAB is currently the language of technical computing most known and used in academia, industry and services. It is composed of a set of tools and a very large number of functions, graphics objects with associated properties and operators. The book begins by looking at the main tools, in particular the Desktop, the Command and History Window, the Editor and the Help Browser. The selected number of functions, graphics objects, related properties and operators, considered fundamental in MATLAB, is a unique and remarkable feature of this book. These basic elements are minutely treated both formally and through examples. The arrangement of every data type as an array is another prominent emphasis of the book. Numerical data used in advanced mathematics usually defined as vectors or matrices are only one example. Others include logical values, strings of characters, dates, images, etc. Standard programming structures, like the many patterns of user functions and of the flow controls, are highlighted. The basic elements of data visualization — the main graphics objects and their properties — are also carefully examined.

Graduate from Excel to MATLAB® to keep up with the evolution of finance data Foundations of Computational Finance with MATLAB® is an introductory text for both finance professionals looking to branch out from the spreadsheet, and for programmers who wish to learn more about finance. As financial data grows in volume and complexity, its very nature has changed to the extent that traditional financial calculators and spreadsheet programs are simply no longer enough. Today ' s analysts need more powerful data solutions with more customization and visualization capabilities, and MATLAB provides all of this and more in an easy-to-learn skillset. This book walks you through the basics, and then shows you how to stretch your new skills to create customized solutions. Part I demonstrates MATLAB ' s capabilities as they apply to traditional finance concepts, and PART II shows you how to create interactive and reusable code, link with external data sources, communicate graphically, and more. Master MATLAB ' s basic operations including matrices, arrays, and flexible data structures Learn how to build your own customized solutions when the built-ins just won ' t do Learn how to handle financial data and industry-specific variables including risk and uncertainty Adopt more accurate modeling practices for portfolios, options, time series, and more MATLAB is an integrated development environment that includes everything you need in one well-designed user interface. Available Toolboxes provide tested algorithms that save you hours of code, and the skills you learn using MATLAB make it easier to learn additional languages if you choose to do so. Financial firms are catching up to universities in MATLAB usage, so this is skill set that will follow you throughout your career. When you ' re ready to step into the new age of finance, Foundations of Computational Finance with MATLAB provides the expert instruction you need to get started quickly.