Root Mean Square Error Rmse Or Mean Absolute Error Mae

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Extreme Hydroclimatic Events and Multivariate Hazards in a Changing Environment - Viviana Maggioni 2019-06-06
Extreme Hydroclimatic Events and Multivariate Hazards in a Changing Environment: A Remote Sensing Approach reviews multivariate hazards in a non-stationary environment, covering both short and long-term predictions from earth observations, along with long-term climate dynamics and models. The book provides a detailed overview of remotely sensed observations, current and future satellite missions useful for hydrologic studies and water resources engineering, and a review of hydroclimatic hazards. Given these tools, readers can improve their abilities to monitor, model and predict these extremes with remote sensing. In addition, the book covers multivariate hazards, like landslides, in case studies that analyze the combination of natural hazards and their impact on the natural and built environment. Finally, it ties hydroclimatic hazards into the Sendai Framework, providing another set of tools for reducing disaster impacts. Emphasizes recent and future satellite missions to study, monitor and forecast hydroclimatic hazards Provides a complete overview and differentiation of remotely sensed products that are useful for monitoring extreme hydroclimatic and related events Covers real-life examples and applications of integrating remote sensing products to study complex multi-hydroclimatic hazards

The Decision Maker's Handbook to Data Science - Stylianos Kampakis 2019-11-26
Data science is expanding across industries at a rapid pace, and the companies first to adopt best practices will gain a significant advantage. To reap the benefits, decision makers need to have a confident understanding of data science and its application in their organization. It is easy for novices to the subject to feel paralyzed by intimidating buzzwords, but what many don't realize is that data science is in fact quite multidisciplinary—useful in the hands of business analysts, communications strategists, designers, and more. With the second edition of The Decision Maker's Handbook to Data Science, you will learn how to think like a veteran data scientist and approach solutions to business problems in an entirely new way. Author Stylianos Kampakis provides you with the expertise and tools required to develop a solid data strategy that is continuously effective. Ethics and legal issues surrounding data collection and algorithmic bias are some common pitfalls that Kampakis helps you avoid, while guiding you on the path to build a thriving data science culture at your organization. This updated and revised second edition, includes plenty of case studies, tools for project assessment, and expanded content for hiring and managing data scientists Data science is a language that everyone at a modern company should understand across departments. Friction in communication arises most often when management does not connect with what a data scientist is doing or how impactful data collection and storage can be for their organization. The Decision Maker's Handbook to Data Science bridges this gap and readies you for both the present and future of your workplace in this engaging, comprehensive guide. What You Will Learn Understand how data science can be used within your business. Recognize the differences between AI, machine learning, and statistics.Become skilled at thinking like a data scientist, without being one.Discover how to hire and manage data scientists.Comprehend how to build the right environment in order to make your organization data-driven. Who This Book Is For Startup founders, product managers, higher level managers, and any other non-technical decision makers who are thinking to implement data science in their organization and hire data scientists. A secondary audience includes people looking for a soft introduction into the subject of data science.

Hands-On Recommendation Systems with Python - Rounak Banik 2018-07-31
With Hands-On Recommendation Systems with Python, learn the tools and techniques required in building various kinds of powerful recommendation systems (collaborative, knowledge and content based) and deploying them to the web Key Features Build industry-standard recommender systems Only familiarity with Python is required No need to wade through complicated machine learning theory to use this book Book Description Recommendation systems are at the heart of almost every internet business today; from Facebook to Netflix to Amazon. Providing good recommendations, whether it's friends, movies, or groceries, goes a long way in defining user experience and enticing your customers to use your platform. This book shows you how to do just that. You will learn about the different kinds of recommenders used in the industry and see how to build them from scratch using Python. No need to wade through tons of machine learning theory—you'll get started with building and learning about recommenders as quickly as possible.. In this book, you will build an IMDB Top 250 clone, a content-based engine that works on movie metadata. You'll use collaborative filters to make use of customer behavior data, and a Hybrid Recommender that incorporates content based and collaborative filtering techniques With this book, all you need to get started with building recommendation systems is a familiarity with Python, and by the time you're fnished, you will have a great grasp of how recommenders work and be in a strong position to apply the techniques that you will learn to your own problem domains. What you will learn Get to grips with the different kinds of recommender systems Master data-wrangling techniques using the pandas library Building an IMDB Top 250 Clone Build a content based engine to recommend movies based on movie metadata Employ data-mining techniques used in building recommenders Build industry-standard collaborative filters using powerful algorithms Building Hybrid Recommenders that incorporate content based and collaborative fltering Who this book is for If you are a Python developer and want to develop applications for social networking, news personalization or smart advertising, this is the book for you. Basic knowledge of machine learning techniques will be helpful, but not mandatory.

Digital Nets and Sequences - Josef Dick 2010-09-09
Indispensable for students, invaluable for researchers, this comprehensive treatment of contemporary quasi–Monte Carlo methods, digital nets and sequences, and discrepancy theory starts from scratch with detailed explanations of the basic concepts and then advances to current methods used in research. As deterministic versions of the Monte Carlo method, quasi–Monte Carlo rules have increased in popularity, with many fruitful applications in mathematical practice. These rules require nodes with good uniform distribution properties, and digital nets and sequences in the sense of Niederreiter are known to be excellent candidates. Besides the classical theory, the book contains chapters on reproducing kernel Hilbert spaces and weighted integration, duality theory for digital nets, polynomial lattice rules, the newest constructions by Niederreiter and Xing and many more. The authors present an accessible introduction to the subject based mainly on material taught in undergraduate courses with numerous examples, exercises and illustrations.

Encyclopedia of Research Design - Neil J. Salkind 2010-06-22
"Comprising more than 500 entries, the Encyclopedia of Research Design explains how to make decisions about research design, undertake research projects in an ethical manner, interpret and draw valid inferences from data, and evaluate experiment design strategies and results. Two additional features carry this encyclopedia far above other works in the field: bibliographic entries devoted to significant articles in the history of research design and reviews of contemporary tools, such as software and statistical procedures, used to analyze results. It covers the spectrum of research design strategies, from material presented in introductory classes to topics necessary in graduate research; it addresses cross- and multidisciplinary research needs, with many examples drawn from the social and behavioral sciences, neurosciences, and biomedical and life sciences; it provides summaries of advantages and disadvantages of often-used strategies; and it uses hundreds of

sample tables, figures, and equations based on real-life cases."--Publisher's description.

Forecasting: principles and practice - Rob J Hyndman 2018-05-08
Forecasting is required in many situations. Stocking an inventory may require forecasts of demand months in advance. Telecommunication routing requires traffic forecasts a few minutes ahead. Whatever the circumstances or time horizons involved, forecasting is an important aid in effective and efficient planning. This textbook provides a comprehensive introduction to forecasting methods and presents enough information about each method for readers to use them sensibly.

Statistical Matching - Marcello D'Orazio 2006-03-30
There is more statistical data produced in today's modern society than ever before. This data is analysed and cross-referenced for innumerable reasons. However, many data sets have no shared element and are harder to combine and therefore obtain any meaningful inference from. Statistical matching allows just that; it is the art of combining information from different sources (particularly sample surveys) that contain no common unit. In response to modern influxes of data, it is an area of rapidly growing interest and complexity. Statistical Matching: Theory and Practice introduces the basics of statistical matching, before going on to offer a detailed, up-to-date overview of the methods used and an examination of their practical applications. Presents a unified framework for both theoretical and practical aspects of statistical matching. Provides a detailed description covering all the steps needed to perform statistical matching. Contains a critical overview of the available statistical matching methods. Discusses all the major issues in detail, such as the Conditional Independence Assumption and the assessment of uncertainty. Includes numerous examples and applications, enabling the reader to apply the methods in their own work. Features an appendix detailing algorithms written in the R language. Statistical Matching: Theory and Practice presents a comprehensive exploration of an increasingly important area. Ideal for researchers in national statistics institutes and applied statisticians, it will also prove to be an invaluable text for scientists and researchers from all disciplines engaged in the multivariate analysis of data collected from different sources.

Adjustment Computations - Charles D. Ghilani 2011-08-26
the complete guide to adjusting for measurement error expanded and updated no measurement is ever exact. Adjustment Computations updates a classic, definitive text on surveying with the latest methodologies and tools for analyzing and adjusting errors with a focus on least squares adjustments, the most rigorous methodology available and the one on which accuracy standards for surveys are based. This extensively updated Fifth Edition shares new information on advances in modern software and GNSS-acquired data. Expanded sections offer a greater amount of computable problems and their worked solutions, while new screenshots guide readers through the exercises. Continuing its legacy as a reliable primer, Adjustment Computations covers the basic terms and fundamentals of errors and methods of analyzing them and progresses to specific adjustment computations and spatial information analysis. Current and comprehensive, the book features: Easy-to-understand language and an emphasis on real-world applications Analyzing data in three dimensions, confidence intervals, statistical testing, and more An updated support web page containing a 150-page solutions manual, software (STATS, ADJUST, and MATRIX for Windows computers), MathCAD worksheets, and more at http://www.wiley.com/college/ghilani The latest information on advanced topics such as the tau criterion used in post-adjustment statistical blunder detection Adjustment Computations, Fifth Edition is an invaluable reference and self-study resource for working surveyors, photogrammetrists, and professionals who use GNSS and GIS for data collection and analysis, including oceanographers, urban planners, foresters, geographers, and transportation planners. It's also an indispensable resource for students preparing for licensing exams and the ideal textbook for courses in surveying, civil engineering, forestry, cartography, and geology.

Building Machine Learning and Deep Learning Models on Google Cloud Platform - Ekaba Bisong 2019-09-27
Take a systematic approach to understanding the fundamentals of machine learning and deep learning from the ground up and how they are applied in practice. You will use this comprehensive guide for building and deploying learning models to address complex use cases while leveraging the computational resources of Google Cloud Platform. Author Ekaba Bisong shows you how machine learning tools and techniques are used to predict or classify events based on a set of

interactions between variables known as features or attributes in a particular dataset. He teaches you how deep learning extends the machine learning algorithm of neural networks to learn complex tasks that are difficult for computers to perform, such as recognizing faces and understanding languages. And you will know how to leverage cloud computing to accelerate data science and machine learning deployments. Building Machine Learning and Deep Learning Models on Google Cloud Platform is divided into eight parts that cover the fundamentals of machine learning and deep learning, the concept of data science and cloud services, programming for data science using the Python stack, Google Cloud Platform (GCP) infrastructure and products, advanced analytics on GCP, and deploying end-to-end machine learning solution pipelines on GCP. What You'll Learn Understand the principles and fundamentals of machine learning and deep learning, the algorithms, how to use them, when to use them, and how to interpret your resultsKnow the programming concepts relevant to machine and deep learning design and development using the Python stack Build and interpret machine and deep learning models Use Google Cloud Platform tools and services to develop and deploy large-scale machine learning and deep learning products Be aware of the different facets and design choices to consider when modeling a learning problem Productionalize machine learning models into software products Who This Book Is For Beginners to the practice of data science and applied machine learning, data scientists at all levels, machine learning engineers, Google Cloud Platform data engineers/architects, and software developers

Practical Machine Learning with H2O - Darren Cook 2016-12-05
Machine learning has finally come of age. With H2O software, you can perform machine learning and data analysis using a simple open source framework that's easy to use, has a wide range of OS and language support, and scales for big data. This hands-on guide teaches you how to use H20 with only minimal math and theory behind the learning algorithms. If you're familiar with R or Python, know a bit of statistics, and have some experience manipulating data, author Darren Cook will take you through H2O basics and help you conduct machine-learning experiments on different sample data sets. You'll explore several modern machine-learning techniques such as deep learning, random forests, unsupervised learning, and ensemble learning. Learn how to import, manipulate, and export data with H2O Explore key machine-learning concepts, such as cross-validation and validation data sets Work with three diverse data sets, including a regression, a multinomial classification, and a binomial classification Use H2O to analyze each sample data set with four supervised machine-learning algorithms Understand how cluster analysis and other unsupervised machine-learning algorithms work

Multimodal Scene Understanding - Michael Yang 2019-07-16
Multimodal Scene Understanding: Algorithms, Applications and Deep Learning presents recent advances in multi-modal computing, with a focus on computer vision and photogrammetry. It provides the latest algorithms and applications that involve combining multiple sources of information and describes the role and approaches of multi-sensory data and multi-modal deep learning. The book is ideal for researchers from the fields of computer vision, remote sensing, robotics, and photogrammetry, thus helping foster interdisciplinary interaction and collaboration between these realms. Researchers collecting and analyzing multi-sensory data collections – for example, KITTI benchmark (stereo+laser) - from different platforms, such as autonomous vehicles, surveillance cameras, UAVs, planes and satellites will find this book to be very useful. Contains state-of-the-art developments on multi-modal computing Shines a focus on algorithms and applications Presents novel deep learning topics on multi-sensor fusion and multi-modal deep learning

Mastering Java for Data Science - Alexey Grigorev 2017-04-27
Use Java to create a diverse range of Data Science applications and bring Data Science into production About This Book An overview of modern Data Science and Machine Learning libraries available in Java Coverage of a broad set of topics, going from the basics of Machine Learning to Deep Learning and Big Data frameworks. Easy-to-follow illustrations and the running example of building a search engine. Who This Book Is For This book is intended for software engineers who are comfortable with developing Java applications and are familiar with the basic concepts of data science. Additionally, it will also be useful for data scientists who do not yet know Java but want or need to learn it. If you are willing to build efficient data science applications and bring them in the enterprise environment without changing the existing stack, this book is for you! What You Will Learn Get a solid understanding of the data processing

toolbox available in Java Explore the data science ecosystem available in Java Find out how to approach different machine learning problems with Java Process unstructured information such as natural language text or images Create your own search engine Get state-of-the-art performance with XGBoost Learn how to build deep neural networks with DeepLearning4j Build applications that scale and process large amounts of data Deploy data science models to production and evaluate their performance In Detail Java is the most popular programming language, according to the TIOBE index, and it is a typical choice for running production systems in many companies, both in the startup world and among large enterprises. Not surprisingly, it is also a common choice for creating data science applications: it is fast and has a great set of data processing tools, both built-in and external. What is more, choosing Java for data science allows you to easily integrate solutions with existing software, and bring data science into production with less effort. This book will teach you how to create data science applications with Java. First, we will revise the most important things when starting a data science application, and then brush up the basics of Java and machine learning before diving into more advanced topics. We start by going over the existing libraries for data processing and libraries with machine learning algorithms. After that, we cover topics such as classification and regression, dimensionality reduction and clustering, information retrieval and natural language processing, and deep learning and big data. Finally, we finish the book by talking about the ways to deploy the model and evaluate it in production settings. Style and approach This is a practical guide where all the important concepts such as classification, regression, and dimensionality reduction are explained with the help of examples.

Bildverarbeitung für die Medizin 2018 - Andreas Maier 2018-02-20
In den letzten Jahren hat sich der Workshop "Bildverarbeitung für die Medizin" durch erfolgreiche Veranstaltungen etabliert. Ziel ist auch 2018 wieder die Darstellung aktueller Forschungsergebnisse und die Vertiefung der Gespräche zwischen Wissenschaftlern, Industrie und Anwendern. Die Beiträge dieses Bandes - einige davon in englischer Sprache - umfassen alle Bereiche der medizinischen Bildverarbeitung, insbesondere Bildgebung und -akquisition, Maschinelles Lernen, Bildsegmentierung und Bildanalyse, Visualisierung und Animation, Zeitreihenanalyse, Computerunterstützte Diagnose, Biomechanische Modellierung, Validierung und Qualitätssicherung, Bildverarbeitung in der Telemedizin u.v.m.

Flexible Imputation of Missing Data, Second Edition - Stef van Buuren 2018-07-17
Missing data pose challenges to real-life data analysis. Simple ad-hoc fixes, like deletion or mean imputation, only work under highly restrictive conditions, which are often not met in practice. Multiple imputation replaces each missing value by multiple plausible values. The variability between these replacements reflects our ignorance of the true (but missing) value. Each of the completed data set is then analyzed by standard methods, and the results are pooled to obtain unbiased estimates with correct confidence intervals. Multiple imputation is a general approach that also inspires novel solutions to old problems by reformulating the task at hand as a missing-data problem. This is the second edition of a popular book on multiple imputation, focused on explaining the application of methods through detailed worked examples using the MICE package as developed by the author. This new edition incorporates the recent developments in this fast-moving field. This class-tested book avoids mathematical and technical details as much as possible: formulas are accompanied by verbal statements that explain the formula in accessible terms. The book sharpens the reader's intuition on how to think about missing data, and provides all the tools needed to execute a well-grounded quantitative analysis in the presence of missing data.

Machine Learning Essentials - Alboukadel Kassambara 2018-03-10
Discovering knowledge from big multivariate data, recorded every days, requires specialized machine learning techniques. This book presents an easy to use practical guide in R to compute the most popular machine learning methods for exploring real word data sets, as well as, for building predictive models. The main parts of the book include: A) Unsupervised learning methods, to explore and discover knowledge from a large multivariate data set using clustering and principal component methods. You will learn hierarchical clustering, k-means, principal component analysis and correspondence analysis methods. B) Regression analysis, to predict a quantitative outcome value using linear regression and non-linear regression strategies. C) Classification techniques, to predict a qualitative outcome value using logistic regression,

discriminant analysis, naive bayes classifier and support vector machines. D) Advanced machine learning methods, to build robust regression and classification models using k-nearest neighbors methods, decision tree models, ensemble methods (bagging, random forest and boosting). E) Model selection methods, to select automatically the best combination of predictor variables for building an optimal predictive model. These include, best subsets selection methods, stepwise regression and penalized regression (ridge, lasso and elastic net regression models). We also present principal component-based regression methods, which are useful when the data contain multiple correlated predictor variables. F) Model validation and evaluation techniques for measuring the performance of a predictive model. G) Model diagnostics for detecting and fixing a potential problems in a predictive model. The book presents the basic principles of these tasks and provide many examples in R. This book offers solid guidance in data mining for students and researchers. Key features: - Covers machine learning algorithm and implementation - Key mathematical concepts are presented - Short, self-contained chapters with practical examples.

Permutation Methods - Paul W. Mielke 2007-07-29
This is the second edition of the comprehensive treatment of statistical inference using permutation techniques. It makes available to practitioners a variety of useful and powerful data analytic tools that rely on very few distributional assumptions. Although many of these procedures have appeared in journal articles, they are not readily available to practitioners. This new and updated edition places increased emphasis on the use of alternative permutation statistical tests based on metric Euclidean distance functions that have excellent robustness characteristics. These alternative permutation techniques provide many powerful multivariate tests including multivariate multiple regression analyses.

Explanatory Model Analysis - Przemyslaw Biecek 2021-02-15
Explanatory Model Analysis Explore, Explain and Examine Predictive Models is a set of methods and tools designed to build better predictive models and to monitor their behaviour in a changing environment. Today, the true bottleneck in predictive modelling is neither the lack of data, nor the lack of computational power, nor inadequate algorithms, nor the lack of flexible models. It is the lack of tools for model exploration (extraction of relationships learned by the model), model explanation (understanding the key factors influencing model decisions) and model examination (identification of model weaknesses and evaluation of model's performance). This book presents a collection of model agnostic methods that may be used for any black-box model together with real-world applications to classification and regression problems.

Proceedings of the International Conference on Soft Computing for Problem Solving (SocProS 2011) December 20-22, 2011 - Kusum Deep 2012-04-13
The objective is to provide the latest developments in the area of soft computing. These are the cutting edge technologies that have immense application in various fields. All the papers will undergo the peer review process to maintain the quality of work.

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow - Aurélien Géron 2019-09-05
Through a series of recent breakthroughs, deep learning has boosted the entire field of machine learning. Now, even programmers who know close to nothing about this technology can use simple, efficient tools to implement programs capable of learning from data. This practical book shows you how. By using concrete examples, minimal theory, and two production-ready Python frameworks—Scikit-Learn and TensorFlow—author Aurélien Géron helps you gain an intuitive understanding of the concepts and tools for building intelligent systems. You'll learn a range of techniques, starting with simple linear regression and progressing to deep neural networks. With exercises in each chapter to help you apply what you've learned, all you need is programming experience to get started. Explore the machine learning landscape, particularly neural nets Use Scikit-Learn to track an example machine-learning project end-to-end Explore several training models, including support vector machines, decision trees, random forests, and ensemble methods Use the TensorFlow library to build and train neural nets Dive into neural net architectures, including convolutional nets, recurrent nets, and deep reinforcement learning Learn techniques for training and scaling deep neural nets

Digital Terrain Analysis in Soil Science and Geology - Igor Florinsky 2016-07-11
Digital Terrain Analysis in Soil Science and Geology, Second Edition,

synthesizes the knowledge on methods and applications of digital terrain analysis and geomorphometry in the context of multi-scale problems in soil science and geology. Divided into three parts, the book first examines main concepts, principles, and methods of digital terrain modeling. It then looks at methods for analysis, modeling, and mapping of spatial distribution of soil properties using digital terrain analysis, before finally considering techniques for recognition, analysis, and interpretation of topographically manifested geological features. Digital Terrain Analysis in Soil Science and Geology, Second Edition, is an updated and revised edition, providing both a theoretical and methodological basis for understanding and applying geographical modeling techniques. Presents an integrated and unified view of digital terrain analysis in both soil science and geology Features research on new advances in the field, including DEM analytical approximation, analytical calculation of local morphometric variables, morphometric globes, and two-dimensional generalized spectral analytical methods Includes a rigorous description of the mathematical principles of digital terrain analysis Provides both a theoretical and methodological basis for understanding and applying geographical modeling

Embedded Mechatronic Systems 2 - Abdelkhalak El Hami 2020-03-17 Embedded Mechatronic Systems 2: Analysis of Failures, Modeling, Simulation and Optimization presents advances in research within the field of mechatronic systems, which integrates reliability into the design process. Providing many detailed examples, this book develops a characterization methodology for faults in mechatronic systems. It analyzes the multi-physical modeling of faults, revealing weaknesses in design and failure mechanisms. This development of meta-models enables us to simulate effects on the reliability of conditions of use and manufacture. Provides many detailed examples Develops a characterization methodology for faults in mechatronic systems Analyzes the multi-physical modeling of faults, revealing weaknesses in design and failure mechanisms

Fundamentals of Ocean Renewable Energy - Simon P. Neill 2018-06-20 Fundamentals of Ocean Renewable Energy: Generating Electricity from the Sea presents the basic concepts of mechanics and introduces the various technical aspects of ocean renewable energy. Contents follow a logical sequence, starting with hydrodynamics and then separately examining each conversion technology, with special focus on tidal energy, offshore wind and wave energy, as well as current and ocean thermal energy conversion (OTEC). The authors explore key topics for resource characterization and optimization, such as monitoring and measurement methods and ocean modeling. They also discuss the sustainability, planning, integration and distribution challenges for the implementation of these technologies, including co-location with other systems. Finally, case studies of ocean energy sites and devices allow for a better understanding of how ocean energy conversion works in real-world settings. This book is an invaluable resource for students at graduate and senior undergraduate level engineering (ocean, mechanical, and civil) and oceanography with prior knowledge of fluid mechanics and mechanics of materials. Presents the fundamental physics and theory behind ocean energy systems, covering both oceanographic and engineering aspects of ocean energy Explores the most widely adopted conversion technologies, including tidal, wave, offshore wind, ocean thermal and currents

Computational Mathematics, Nanoelectronics, and Astrophysics - Shaibal Mukherjee 2021-03-23 This book is a collection of original papers presented at the International Conference on Computational Mathematics in Nanoelectronics and Astrophysics (CMNA 2018) held at the Indian Institute of Technology Indore, India, from 1 to 3 November 2018. It aims at presenting recent developments of computational mathematics in nanoelectronics, astrophysics and related areas of space sciences and engineering. These proceedings discuss the most advanced innovations, trends and real-world challenges encountered and their solutions with the application of computational mathematics in nanoelectronics, astrophysics and space sciences. From focusing on nano-enhanced smart technological developments to the research contributions of premier institutes in India and abroad on ISRO's future space explorations—this book includes topics from highly interdisciplinary areas of research. The book is of interest to researchers, students and practising engineers working in diverse areas of science and engineering, ranging from applied and computational mathematics to nanoelectronics, nanofabrications and astrophysics.

An Introduction to Generalized Linear Models - George H. Dunteman 2006

Providing a thorough introduction to generalized linear models (GLM), exponential family distribution & maximum likelihood estimation, this book includes discussion on checking model adequacy & description on how to use a popular statistical software programme, SAS, to fit GLM.

Machine Learning with Spark - Second Edition - Rajdeep Dua 2016-10-31 Develop intelligent machine learning systems with SparkAbout This Book*Get to the grips with the latest version of Apache Spark*Utilize Spark's machine learning library to implement predictive analytics*Leverage Spark's powerful tools to load, analyze, clean, and transform your dataWho This Book Is ForIf you have a basic knowledge of machine learning and want to implement various machine-learning concepts in the context of Spark ML, this book is for you. You should be well versed with the Scala and Python languages.What You Will Learn*Get hands-on with the latest version of Spark ML*Create your first Spark program with Scala and Python*Set up and configure a development environment for Spark on your own computer, as well as on Amazon EC2*Access public machine learning datasets and use Spark to load, process, clean, and transform data*Use Spark's machine learning library to implement programs by utilizing well-known machine learning models*Deal with large-scale text data, including feature extraction and using text data as input to your machine learning models*Write Spark functions to evaluate the performance of your machine learning modelsIn DetailSpark ML is the machine learning module of Spark. It uses in-memory RDDs to process machine learning models faster for clustering, classification, and regression.This book will teach you about popular machine learning algorithms and their implementation. You will learn how various machine learning concepts are implemented in the context of Spark ML. You will start by installing Spark in a single and multinode cluster. Next you'll see how to execute Scala and Python based programs for Spark ML. Then we will take a few datasets and go deeper into clustering, classification, and regression. Toward the end, we will also cover text processing using Spark ML.Once you have learned the concepts, they can be applied to implement algorithms in either green-field implementations or to migrate existing systems to this new platform. You can migrate from Mahout or Scikit to use Spark ML.

The Essentials of Biostatistics for Physicians, Nurses, and Clinicians - Michael R. Chernick 2011-08-04 A fundamental and straightforward guide to using and understanding statistical concepts in medical research Designed specifically for healthcare practitioners who need to understand basic biostatistics but do not have much time to spare, The Essentials of Biostatistics for Physicians, Nurses and Clinicians presents important statistical methods used in today's biomedical research and provides insight on their appropriate application. Rather than provide detailed mathematics for each of these methods, the book emphasizes what healthcare practitioners need to know to interpret and incorporate the latest biomedical research into their practices. The author draws from his own experience developing and teaching biostatistics courses for physicians and nurses, offering a presentation that is non-technical and accessible. The book begins with a basic introduction to the relationship between biostatistics and medical research, asking the question "why study statistics?," while also exploring the significance of statisitcal methods in medical literature and clinical trials research. Subsequent chapters explore key topics, including: Correlation, regression, and logistic regression Diagnostics Estimating means and proportions Normal distribution and the central limit theorem Sampling from populations Contingency tables Meta-analysis Nonparametric methods Survival analysis Throughout the book, statistical methods that are often utilized in biomedical research are outlined, including repeated measures analysis of variance, hazard ratios, contingency tables, log rank tests, bioequivalence, cross-over designs, selection bias, and group sequential methods. Exercise sets at the end of each chapter allow readers to test their comprehension of the presented concepts and techniques. The Essentials of Biostatistics for Physicians, Nurses, and Clinicians is an excellent reference for doctors, nurses, and other practicing clinicians in the fields of medicine, public health, pharmacy, and the life sciences who need to understand and apply statistical methods in their everyday work. It also serves as a suitable supplement for courses on biostatistics at the upper-undergraduate and graduate levels.

Forecasting commodity prices using long-short-term memory neural networks - Ly, Racine 2021-02-10 This paper applies a recurrent neural network (RNN) method to forecast cotton and oil prices. We show how these new tools from machine learning, particularly Long-Short Term Memory (LSTM) models, complement traditional methods. Our results show that machine learning

methods fit reasonably well with the data but do not outperform systematically classical methods such as Autoregressive Integrated Moving Average (ARIMA) or the naïve models in terms of out of sample forecasts. However, averaging the forecasts from the two type of models provide better results compared to either method. Compared to the ARIMA and the LSTM, the Root Mean Squared Error (RMSE) of the average forecast was 0.21 and 21.49 percent lower, respectively, for cotton. For oil, the forecast averaging does not provide improvements in terms of RMSE. We suggest using a forecast averaging method and extending our analysis to a wide range of commodity prices.

Spatial Microsimulation with R - Robin Lovelace 2017-09-07
Generate and Analyze Multi-Level Data Spatial microsimulation involves the generation, analysis, and modeling of individual-level data allocated to geographical zones. Spatial Microsimulation with R is the first practical book to illustrate this approach in a modern statistical programming language. Get Insight into Complex Behaviors The book progresses from the principles underlying population synthesis toward more complex issues such as household allocation and using the results of spatial microsimulation for agent-based modeling. This equips you with the skills needed to apply the techniques to real-world situations. The book demonstrates methods for population synthesis by combining individual and geographically aggregated datasets using the recent R packages ipfp and mipfp. This approach represents the "best of both worlds" in terms of spatial resolution and person-level detail, overcoming issues of data confidentiality and reproducibility. Implement the Methods on Your Own Data Full of reproducible examples using code and data, the book is suitable for students and applied researchers in health, economics, transport, geography, and other fields that require individual-level data allocated to small geographic zones. By explaining how to use tools for modeling phenomena that vary over space, the book enhances your knowledge of complex systems and empowers you to provide evidence-based policy guidance.

Practical Statistics for Data Scientists - Peter Bruce 2017-05-10
Statistical methods are a key part of of data science, yet very few data scientists have any formal statistics training. Courses and books on basic statistics rarely cover the topic from a data science perspective. This practical guide explains how to apply various statistical methods to data science, tells you how to avoid their misuse, and gives you advice on what's important and what's not. Many data science resources incorporate statistical methods but lack a deeper statistical perspective. If you're familiar with the R programming language, and have some exposure to statistics, this quick reference bridges the gap in an accessible, readable format. With this book, you'll learn: Why exploratory data analysis is a key preliminary step in data science How random sampling can reduce bias and yield a higher quality dataset, even with big data How the principles of experimental design yield definitive answers to questions How to use regression to estimate outcomes and detect anomalies Key classification techniques for predicting which categories a record belongs to Statistical machine learning methods that "learn" from data Unsupervised learning methods for extracting meaning from unlabeled data

Field Guide to Continuous Probability Distributions - Gavin E Crooks 2019-04
A common problem is that of describing the probability distribution of a single, continuous variable. A few distributions, such as the normal and exponential, were discovered in the 1800's or earlier. But about a century ago the great statistician, Karl Pearson, realized that the known probability distributions were not sufficient to handle all of the phenomena then under investigation, and set out to create new distributions with useful properties. During the 20th century this process continued with abandon and a vast menagerie of distinct mathematical forms were discovered and invented, investigated, analyzed, rediscovered and renamed, all for the purpose of describing the probability of some interesting variable. There are hundreds of named distributions and synonyms in current usage. The apparent diversity is unending and disorienting. Fortunately, the situation is less confused than it might at first appear. Most common, continuous, univariate, unimodal distributions can be organized into a small number of distinct families, which are all special cases of a single Grand Unified Distribution. This compendium details these hundred or so simple distributions, their properties and their interrelations.

Multi-robot Exploration for Environmental Monitoring - Kshitij Tiwari 2019-11-29
Multi-robot Exploration for Environmental Monitoring: The Resource Constrained Perspective provides readers with the necessary robotics and mathematical tools required to realize the correct architecture. The architecture discussed in the book is not confined to environment monitoring, but can also be extended to search-and-rescue, border patrolling, crowd management and related applications. Several law enforcement agencies have already started to deploy UAVs, but instead of using teleoperated UAVs this book proposes methods to fully automate surveillance missions. Similarly, several government agencies like the US-EPA can benefit from this book by automating the process. Several challenges when deploying such models in real missions are addressed and solved, thus laying stepping stones towards realizing the architecture proposed. This book will be a great resource for graduate students in Computer Science, Computer Engineering, Robotics, Machine Learning and Mechatronics. Analyzes the constant conflict between machine learning models and robot resources Presents a novel range estimation framework tested on real robots (custom built and commercially available)

Sustainable Development Practices Using Geoinformatics - Varun Narayan Mishra 2020-11-25
This exciting new volume will provide a comprehensive overview of the applications of geoinformatics technology for engineers, scientists, and students to become more productive, more aware, and more responsive to global climate change issues and how to manage sustainable development of Earth's resources. Over the last few years, the stress on natural resources has increased enormously due to anthropogenic activities especially through urbanization and industrialization processes. Sustainable development while protecting the Earth's environment involves the best possible management of natural resources, subject to the availability of reliable, accurate and timely information on regional and global scales. There is an increasing demand for an interdisciplinary approach and sound knowledge on each specific resource, as well as on the ecological and socio-economic perspectives related to their use. Geoinformatics, including Remote Sensing (RS), Geographical Information System (GIS), and Global Positioning System (GPS), is a groundbreaking and advanced technology for acquiring information required for natural resource management and addressing the concerns related to sustainable development. It offers a powerful and proficient tool for mapping, monitoring, modeling, and management of natural resources. There is, however, a lack of studies in understanding the core science and research elements of geoinformatics, as well as larger issues of scaling to use geoinformatics in sustainable development and management practices of natural resources. There is also a fundamental gap between the theoretical concepts and the operational use of these advance techniques. Sustainable Development Practices Using Geoinformatics, written by well-known academicians, experts and researchers provides answers to these problems, offering the engineer, scientist, or student the most thorough, comprehensive, and practical coverage of this subject available today, a must-have for any library.

Deep Learning for Medical Image Analysis - S. Kevin Zhou 2017-01-18
Deep learning is providing exciting solutions for medical image analysis problems and is seen as a key method for future applications. This book gives a clear understanding of the principles and methods of neural network and deep learning concepts, showing how the algorithms that integrate deep learning as a core component have been applied to medical image detection, segmentation and registration, and computer-aided analysis, using a wide variety of application areas. Deep Learning for Medical Image Analysis is a great learning resource for academic and industry researchers in medical imaging analysis, and for graduate students taking courses on machine learning and deep learning for computer vision and medical image computing and analysis. Covers common research problems in medical image analysis and their challenges Describes deep learning methods and the theories behind approaches for medical image analysis Teaches how algorithms are applied to a broad range of application areas, including Chest X-ray, breast CAD, lung and chest, microscopy and pathology, etc. Includes a Foreword written by Nicholas Ayache

Assessing the Accuracy of Remotely Sensed Data - Russell G. Congalton 2008-12-12
Accuracy assessment of maps derived from remotely sensed data has continued to grow since the first edition of this groundbreaking book. As a result, the much-anticipated new edition is significantly expanded and enhanced to reflect growth in the field. The new edition features three new chapters, including: Fuzzy accuracy assessmentPositional accu
Measure, Integration & Real Analysis - Sheldon Axler 2019-11-29
This open access textbook welcomes students into the fundamental

theory of measure, integration, and real analysis. Focusing on an accessible approach, Axler lays the foundations for further study by promoting a deep understanding of key results. Content is carefully curated to suit a single course, or two-semester sequence of courses, creating a versatile entry point for graduate studies in all areas of pure and applied mathematics. Motivated by a brief review of Riemann integration and its deficiencies, the text begins by immersing students in the concepts of measure and integration. Lebesgue measure and abstract measures are developed together, with each providing key insight into the main ideas of the other approach. Lebesgue integration links into results such as the Lebesgue Differentiation Theorem. The development of products of abstract measures leads to Lebesgue measure on Rn. Chapters on Banach spaces, Lp spaces, and Hilbert spaces showcase major results such as the Hahn–Banach Theorem, Hölder's Inequality, and the Riesz Representation Theorem. An in-depth study of linear maps on Hilbert spaces culminates in the Spectral Theorem and Singular Value Decomposition for compact operators, with an optional interlude in real and complex measures. Building on the Hilbert space material, a chapter on Fourier analysis provides an invaluable introduction to Fourier series and the Fourier transform. The final chapter offers a taste of probability. Extensively class tested at multiple universities and written by an award-winning mathematical expositor, Measure, Integration & Real Analysis is an ideal resource for students at the start of their journey into graduate mathematics. A prerequisite of elementary undergraduate real analysis is assumed; students and instructors looking to reinforce these ideas will appreciate the electronic Supplement for Measure, Integration & Real Analysis that is freely available online.

Artificial Intelligence for Renewable Energy Systems - Ajay Kumar Vyas 2022-03-02
ARTIFICIAL INTELLIGENCE FOR RENEWABLE ENERGY SYSTEMS Renewable energy systems, including solar, wind, biodiesel, hybrid energy, and other relevant types, have numerous advantages compared to their conventional counterparts. This book presents the application of machine learning and deep learning techniques for renewable energy system modeling, forecasting, and optimization for efficient system design. Due to the importance of renewable energy in today's world, this book was designed to enhance the reader's knowledge based on current developments in the field. For instance, the extraction and selection of machine learning algorithms for renewable energy systems, forecasting of wind and solar radiation are featured in the book. Also highlighted are intelligent data, renewable energy informatics systems based on supervisory control and data acquisition (SCADA); and intelligent condition monitoring of solar and wind energy systems. Moreover, an AI-based system for real-time decision-making for renewable energy systems is presented; and also demonstrated is the prediction of energy consumption in green buildings using machine learning. The chapter authors also provide both experimental and real datasets with great potential in the renewable energy sector, which apply machine learning (ML) and deep learning (DL) algorithms that will be helpful for economic and environmental forecasting of the renewable energy business. Audience The primary target audience includes research scholars, industry engineers, and graduate students working in renewable energy, electrical engineering, machine learning, information & communication technology.

Forecast Verification - Ian T. Jolliffe 2003-08-01
This handy reference introduces the subject of forecast verification and provides a review of the basic concepts, discussing different types of data that may be forecast. Each chapter covers a different type of predicted quantity (predictand), then looks at some of the relationships between economic value and skill scores, before moving on to review the key concepts and summarise aspects of forecast verification that receive the most attention in other disciplines. The book concludes with a discussion on the most important topics in the field that are the subject of current research or that would benefit from future research. An easy to read guide of current techniques with real life case studies An up-to-date and practical introduction to the different techniques and an examination of their strengths and weaknesses Practical advice given by some of the world?s leading forecasting experts Case studies and illustrations of actual verification and its interpretation Comprehensive glossary and consistent statistical and mathematical definition of commonly used terms
Improving Information for Social Policy Decisions -- The Uses of Microsimulation Modeling - National Research Council 1991-01-01
This book reviews the uses and abuses of microsimulation models--large,

complex models that produce estimates of the effects on program costs and who would gain and who would lose from proposed changes in government policies ranging from health care to welfare to taxes. Volume 1 is designed to guide future investment in modeling and analysis capability on the part of government agencies that produce policy estimates. It will inform congressional and executive decision makers about the strengths and weaknesses of models and estimates and will interest social scientists in the potential of microsimulation techniques for basic and applied research as well as policy uses. The book concludes that a "second revolution" is needed to improve the quality of microsimulation and other policy analysis models and the estimates they produce, with a special emphasis on systematic validation of models and communication of validation results to decision makers.

Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R - Joseph F. Hair Jr. 2021-11-03
Partial least squares structural equation modeling (PLS-SEM) has become a standard approach for analyzing complex inter-relationships between observed and latent variables. Researchers appreciate the many advantages of PLS-SEM such as the possibility to estimate very complex models and the method's flexibility in terms of data requirements and measurement specification. This practical open access guide provides a step-by-step treatment of the major choices in analyzing PLS path models using R, a free software environment for statistical computing, which runs on Windows, macOS, and UNIX computer platforms. Adopting the R software's SEMinR package, which brings a friendly syntax to creating and estimating structural equation models, each chapter offers a concise overview of relevant topics and metrics, followed by an in-depth description of a case study. Simple instructions give readers the "how-tos" of using SEMinR to obtain solutions and document their results. Rules of thumb in every chapter provide guidance on best practices in the application and interpretation of PLS-SEM.

Deep Learning Quick Reference - Michael Bernico 2018-03-09
Dive deeper into neural networks and get your models trained, optimized with this quick reference guide Key Features A quick reference to all important deep learning concepts and their implementations Essential tips, tricks, and hacks to train a variety of deep learning models such as CNNs, RNNs, LSTMs, and more Supplemented with essential mathematics and theory, every chapter provides best practices and safe choices for training and fine-tuning your models in Keras and Tensorflow. Book Description Deep learning has become an essential necessity to enter the world of artificial intelligence. With this book deep learning techniques will become more accessible, practical, and relevant to practicing data scientists. It moves deep learning from academia to the real world through practical examples. You will learn how Tensor Board is used to monitor the training of deep neural networks and solve binary classification problems using deep learning. Readers will then learn to optimize hyperparameters in their deep learning models. The book then takes the readers through the practical implementation of training CNN's, RNN's, and LSTM's with word embeddings and seq2seq models from scratch. Later the book explores advanced topics such as Deep Q Network to solve an autonomous agent problem and how to use two adversarial networks to generate artificial images that appear real. For implementation purposes, we look at popular Python-based deep learning frameworks such as Keras and Tensorflow, Each chapter provides best practices and safe choices to help readers make the right decision while training deep neural networks. By the end of this book, you will be able to solve real-world problems quickly with deep neural networks. What you will learn Solve regression and classification challenges with TensorFlow and Keras Learn to use Tensor Board for monitoring neural networks and its training Optimize hyperparameters and safe choices/best practices Build CNN's, RNN's, and LSTM's and using word embedding from scratch Build and train seq2seq models for machine translation and chat applications. Understanding Deep Q networks and how to use one to solve an autonomous agent problem. Explore Deep Q Network and address autonomous agent challenges. Who this book is for If you are a Data Scientist or a Machine Learning expert, then this book is a very useful read in training your advanced machine learning and deep learning models. You can also refer this book if you are stuck in-between the neural network modeling and need immediate assistance in getting accomplishing the task smoothly. Some prior knowledge of Python and tight hold on the basics of machine learning is required.