

Practical Time Series Forecasting A Hands On Guide 3rd Edition

Practical Analytics

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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.

Deep Learning for Time Series Forecasting - Jason Brownlee 2018-08-30

Deep learning methods offer a lot of promise for time series forecasting, such as the automatic learning of temporal dependence and the automatic handling of temporal structures like trends and seasonality. With clear explanations, standard Python libraries, and step-by-step tutorial lessons you'll discover how to develop deep learning models for your own time series forecasting projects.

Practical Data Analysis - Hector Cuesta 2016-09-30

A practical guide to obtaining, transforming, exploring, and analyzing data using Python, MongoDB, and Apache Spark About This Book Learn to use various data analysis tools and algorithms to classify, cluster, visualize, simulate, and forecast your data Apply Machine Learning algorithms to different kinds of data such as social networks, time series, and images A hands-on guide to understanding the nature of data and how to turn it into insight Who This Book Is For This book is for developers who want to implement data analysis and data-driven algorithms in a practical way. It is also suitable for those without a background in data analysis or data processing. Basic knowledge of Python programming, statistics, and linear algebra is assumed. What You Will Learn Acquire, format, and visualize your data Build an image-similarity search engine Generate meaningful visualizations anyone can understand Get started with analyzing social network graphs Find out how to implement sentiment text analysis Install data analysis tools such as Pandas, MongoDB, and Apache Spark Get to grips with Apache Spark Implement machine learning algorithms such as classification or forecasting In Detail Beyond buzzwords like Big Data or Data Science, there are a great opportunities to innovate in many businesses using data analysis to get data-driven products. Data analysis involves asking many questions about data in order to discover insights and generate value for a product or a service. This book explains the basic data algorithms without the theoretical jargon, and you'll get hands-on turning data into insights using machine learning techniques. We will perform data-driven innovation processing for several types of data such as text, Images, social network graphs, documents, and time series, showing you how to implement large data processing with MongoDB and Apache Spark. Style and approach This is a hands-on guide to data analysis and data processing. The concrete examples are explained with simple code and accessible data.

SAS for Forecasting Time Series, Third Edition - John C. Brocklebank, Ph.D. 2018-03-14

To use statistical methods and SAS applications to forecast the future values of data taken over time, you need only follow this thoroughly updated classic on the subject. With this third edition of SAS for Forecasting Time Series, intermediate-to-advanced SAS users—such as statisticians, economists, and data scientists—can now match the most sophisticated forecasting methods to the most current SAS applications. Starting with fundamentals, this new edition presents methods for modeling both univariate and multivariate data taken over time. From the well-known ARIMA models to unobserved components, methods that

span the range from simple to complex are discussed and illustrated. Many of the newer methods are variations on the basic ARIMA structures. Completely updated, this new edition includes fresh, interesting business situations and data sets, and new sections on these up-to-date statistical methods: ARIMA models Vector autoregressive models Exponential smoothing models Unobserved component and state-space models Seasonal adjustment Spectral analysis Focusing on application, this guide teaches a wide range of forecasting techniques by example. The examples provide the statistical underpinnings necessary to put the methods into practice. The following up-to-date SAS applications are covered in this edition: The ARIMA procedure The AUTOREG procedure The VARMAX procedure The ESM procedure The UCM and SSM procedures The X13 procedure The SPECTRA procedure SAS Forecast Studio Each SAS application is presented with explanation of its strengths, weaknesses, and best uses. Even users of automated forecasting systems will benefit from this knowledge of what is done and why. Moreover, the accompanying examples can serve as templates that you easily adjust to fit your specific forecasting needs. This book is part of the SAS Press program.

Practical Time Series Forecasting with R - Galit Shmueli 2016-07-19

Practical Time Series Forecasting with R: A Hands-On Guide, Second Edition provides an applied approach to time-series forecasting. Forecasting is an essential component of predictive analytics. The book introduces popular forecasting methods and approaches used in a variety of business applications. The book offers clear explanations, practical examples, and end-of-chapter exercises and cases. Readers will learn to use forecasting methods using the free open-source R software to develop effective forecasting solutions that extract business value from time-series data. Featuring improved organization and new material, the Second Edition also includes: - Popular forecasting methods including smoothing algorithms, regression models, and neural networks - A practical approach to evaluating the performance of forecasting solutions - A business-analytics exposition focused on linking time-series forecasting to business goals - Guided cases for integrating the acquired knowledge using real data* End-of-chapter problems to facilitate active learning - A companion site with data sets, R code, learning resources, and instructor materials (solutions to exercises, case studies) - Globally-available textbook, available in both softcover and Kindle formats Practical Time Series Forecasting with R: A Hands-On Guide, Second Edition is the perfect textbook for upper-undergraduate, graduate and MBA-level courses as well as professional programs in data science and business analytics. The book is also designed for practitioners in the fields of operations research, supply chain management, marketing, economics, finance and management. For more information, visit forecastingbook.com

The Analysis of Time Series: Theory and Practice - Christopher Chatfield 2013-12-01

Time-series analysis is an area of statistics which is of particular interest at the present time. Time series arise in many different areas, ranging from marketing to oceanography, and the analysis of such series raises many problems of both a theoretical and practical nature. I first became interested in the subject as a postgraduate student at Imperial College, when I attended a stimulating course of lectures on time-series given by Dr. (now Professor) G. M. Jenkins. The subject has fascinated me ever since. Several books have been written on theoretical aspects of time-series analysis. The aim of this book is to provide an introduction to the subject which bridges the gap between theory and practice. The book has also been written to make what is rather a difficult subject as

understandable as possible. Enough theory is given to introduce the concepts of time-series analysis and to make the book mathematically interesting. In addition, practical problems are considered so as to help the reader tackle the analysis of real data. The book assumes a knowledge of basic probability theory and elementary statistical inference (see Appendix III). The book can be used as a text for an undergraduate or postgraduate course in time-series, or it can be used for self tuition by research workers. Throughout the book, references are usually given to recent readily accessible books and journals rather than to the original attributive references. Wold's (1965) bibliography contains many time series references published before 1959.

Practical Time Series Analysis - Aileen Nielsen 2019-09-20

Time series data analysis is increasingly important due to the massive production of such data through the internet of things, the digitalization of healthcare, and the rise of smart cities. As continuous monitoring and data collection become more common, the need for competent time series analysis with both statistical and machine learning techniques will increase. Covering innovations in time series data analysis and use cases from the real world, this practical guide will help you solve the most common data engineering and analysis challenges in time series, using both traditional statistical and modern machine learning techniques.

Author Aileen Nielsen offers an accessible, well-rounded introduction to time series in both R and Python that will have data scientists, software engineers, and researchers up and running quickly. You'll get the guidance you need to confidently: Find and wrangle time series data Undertake exploratory time series data analysis Store temporal data Simulate time series data Generate and select features for a time series Measure error Forecast and classify time series with machine or deep learning Evaluate accuracy and performance

Essentials of Time Series for Financial Applications - Massimo Guidolin 2018-05-29

Essentials of Time Series for Financial Applications serves as an agile reference for upper level students and practitioners who desire a formal, easy-to-follow introduction to the most important time series methods applied in financial applications (pricing, asset management, quant strategies, and risk management). Real-life data and examples developed with EViews illustrate the links between the formal apparatus and the applications. The examples either directly exploit the tools that EViews makes available or use programs that by employing EViews implement specific topics or techniques. The book balances a formal framework with as few proofs as possible against many examples that support its central ideas. Boxes are used throughout to remind readers of technical aspects and definitions and to present examples in a compact fashion, with full details (workout files) available in an on-line appendix. The more advanced chapters provide discussion sections that refer to more advanced textbooks or detailed proofs. Provides practical, hands-on examples in time-series econometrics Presents a more application-oriented, less technical book on financial econometrics Offers rigorous coverage, including technical aspects and references for the proofs, despite being an introduction Features examples worked out in EViews (9 or higher)

Practical Statistics for Data Scientists - Peter Bruce 2017-05-10

Statistical methods are a key part 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

Practical Time Series Analysis - Avishek Pal 2017-09-28

Step by Step guide filled with real world practical examples. About This Book* Get your first experience with data analysis with one of the most powerful types of analysis-time-series.* Find patterns in your data and predict the future pattern based on historical data.* Learn the statistics,

theory, and implementation of Time-series methods using this example-rich guide Who This Book Is For This book is for anyone who wants to analyze data over time and/or frequency. A statistical background is necessary to quickly learn the analysis methods. What You Will Learn* Understand the basic concepts of Time Series Analysis and appreciate its importance for the success of a data science project* Develop an understanding of loading, exploring, and visualizing time-series data* Explore auto-correlation and gain knowledge of statistical techniques to deal with non-stationarity time series* Take advantage of exponential smoothing to tackle noise in time series data* Learn how to use autoregressive models to make predictions using time-series data* Build predictive models on time series using techniques based on autoregressive moving averages* Discover recent advancements in deep learning to build accurate forecasting models for time series* Gain familiarity with the basics of Python as a powerful yet simple to write programming language In Detail Time Series Analysis allows us to analyze data which is generated over a period of time and has sequential interdependencies between the observations. This book describes special mathematical tricks and techniques which are geared towards exploring the internal structures of time series data and generating powerful descriptive and predictive insights. Also, the book is full of real-life examples of time series and their analyses using cutting-edge solutions developed in Python. The book starts with descriptive analysis to create insightful visualizations of internal structures such as trend, seasonality and autocorrelation. Next, the statistical methods of dealing with autocorrelation and non-stationary time series are described. This is followed by exponential smoothing to produce meaningful insights from noisy time series data. At this point, we shift focus towards predictive analysis and introduce autoregressive models such as ARMA and ARIMA for time series forecasting. Later, powerful deep learning methods are presented, to develop accurate forecasting models for complex time series, and under the availability of little domain knowledge. All the topics are illustrated with real-life problem scenarios and their solutions by best-practice implementations in Python. The book concludes with the Appendix, with a brief discussion of programming and solving data science problems using Python. Style and approach This book takes the readers from the basic to advance level of Time series analysis in a very practical and real world use cases.

Practical Time Series Forecasting with R - Galit Shmueli 2015-07-17

"Practical time series forecasting with R is a hands-on introduction to quantitative forecasting of time series. Quantitative forecasting is an important component of decision making in a wide range of areas and across many business functions including economic forecasting, workload projections, sales forecasts, and transportation demand ... The book introduces readers to the most popular statistical models and data mining algorithms used in practice. It covers issues relating to different steps of the forecasting process, from goal definition through data collection, visualization, pre-processing, modeling, performance evaluation to implementation and communication."--Back cover.

Getting Started with Business Analytics - David Roi Haroon 2013-03-26

Assuming no prior knowledge or technical skills, Getting Started with Business Analytics: Insightful Decision-Making explores the contents, capabilities, and applications of business analytics. It bridges the worlds of business and statistics and describes business analytics from a non-commercial standpoint. The authors demystify the main concepts and terminologies and give many examples of real-world applications. The first part of the book introduces business data and recent technologies that have promoted fact-based decision-making. The authors look at how business intelligence differs from business analytics. They also discuss the main components of a business analytics application and the various requirements for integrating business with analytics. The second part presents the technologies underlying business analytics: data mining and data analytics. The book helps you understand the key concepts and ideas behind data mining and shows how data mining has expanded into data analytics when considering new types of data such as network and text data. The third part explores business analytics in depth, covering customer, social, and operational analytics. Each chapter in this part incorporates hands-on projects based on publicly available data. Helping you make sound decisions based on hard data, this self-contained guide provides an integrated framework for data mining in business analytics. It takes you on a journey through this data-rich world, showing you how to deploy business analytics solutions in your organization.

Practical Time Series Analysis - Dr. Avishek Pal 2017-09-28

Step by Step guide filled with real world practical examples. About This

Book Get your first experience with data analysis with one of the most powerful types of analysis—time-series. Find patterns in your data and predict the future pattern based on historical data. Learn the statistics, theory, and implementation of Time-series methods using this example-rich guide Who This Book Is For This book is for anyone who wants to analyze data over time and/or frequency. A statistical background is necessary to quickly learn the analysis methods. What You Will Learn Understand the basic concepts of Time Series Analysis and appreciate its importance for the success of a data science project Develop an understanding of loading, exploring, and visualizing time-series data Explore auto-correlation and gain knowledge of statistical techniques to deal with non-stationarity time series Take advantage of exponential smoothing to tackle noise in time series data Learn how to use autoregressive models to make predictions using time-series data Build predictive models on time series using techniques based on autoregressive moving averages Discover recent advancements in deep learning to build accurate forecasting models for time series Gain familiarity with the basics of Python as a powerful yet simple to write programming language In Detail Time Series Analysis allows us to analyze data which is generated over a period of time and has sequential interdependencies between the observations. This book describes special mathematical tricks and techniques which are geared towards exploring the internal structures of time series data and generating powerful descriptive and predictive insights. Also, the book is full of real-life examples of time series and their analyses using cutting-edge solutions developed in Python. The book starts with descriptive analysis to create insightful visualizations of internal structures such as trend, seasonality and autocorrelation. Next, the statistical methods of dealing with autocorrelation and non-stationary time series are described. This is followed by exponential smoothing to produce meaningful insights from noisy time series data. At this point, we shift focus towards predictive analysis and introduce autoregressive models such as ARMA and ARIMA for time series forecasting. Later, powerful deep learning methods are presented, to develop accurate forecasting models for complex time series, and under the availability of little domain knowledge. All the topics are illustrated with real-life problem scenarios and their solutions by best-practice implementations in Python. The book concludes with the Appendix, with a brief discussion of programming and solving data science problems using Python. Style and approach This book takes the readers from the basic to advance level of Time series analysis in a very practical and real world use cases.

Forecasting Time Series Data with Facebook Prophet - Greg Rafferty
2021-03-12

Create and improve high-quality automated forecasts for time series data that have strong seasonal effects, holidays, and additional regressors using Python Key Features Learn how to use the open-source forecasting tool Facebook Prophet to improve your forecasts Build a forecast and run diagnostics to understand forecast quality Fine-tune models to achieve high performance, and report that performance with concrete statistics Book Description Prophet enables Python and R developers to build scalable time series forecasts. This book will help you to implement Prophet's cutting-edge forecasting techniques to model future data with higher accuracy and with very few lines of code. You will begin by exploring the evolution of time series forecasting, from the basic early models to the advanced models of the present day. The book will demonstrate how to install and set up Prophet on your machine and build your first model with only a few lines of code. You'll then cover advanced features such as visualizing your forecasts, adding holidays, seasonality, and trend change points, handling outliers, and more, along with understanding why and how to modify each of the default parameters. Later chapters will show you how to optimize more complicated models with hyperparameter tuning and by adding additional regressors to the model. Finally, you'll learn how to run diagnostics to evaluate the performance of your models and see some useful features when running Prophet in production environments. By the end of this Prophet book, you will be able to take a raw time series dataset and build advanced and accurate forecast models with concise, understandable, and repeatable code. What you will learn Gain an understanding of time series forecasting, including its history, development, and uses Understand how to install Prophet and its dependencies Build practical forecasting models from real datasets using Python Understand the Fourier series and learn how it models seasonality Decide when to use additive and when to use multiplicative seasonality Discover how to identify and deal with outliers in time series data Run diagnostics to evaluate and compare the performance of your models Who this book is for This book is for data

scientists, data analysts, machine learning engineers, software engineers, project managers, and business managers who want to build time series forecasts in Python. Working knowledge of Python and a basic understanding of forecasting principles and practices will be useful to apply the concepts covered in this book more easily.

Time Series Analysis and Its Applications - Robert H. Shumway
2014-01-15

Hands-on Time Series Analysis with Python - B V Vishwas
2020-08-25

Learn the concepts of time series from traditional to bleeding-edge techniques. This book uses comprehensive examples to clearly illustrate statistical approaches and methods of analyzing time series data and its utilization in the real world. All the code is available in Jupyter notebooks. You'll begin by reviewing time series fundamentals, the structure of time series data, pre-processing, and how to craft the features through data wrangling. Next, you'll look at traditional time series techniques like ARMA, SARIMAX, VAR, and VARMA using trending framework like StatsModels and pmdarima. The book also explains building classification models using sktime, and covers advanced deep learning-based techniques like ANN, CNN, RNN, LSTM, GRU and Autoencoder to solve time series problem using Tensorflow. It concludes by explaining the popular framework fbprophet for modeling time series analysis. After reading Hands-On Time Series Analysis with Python, you'll be able to apply these new techniques in industries, such as oil and gas, robotics, manufacturing, government, banking, retail, healthcare, and more. What You'll Learn: · Explains basics to advanced concepts of time series · How to design, develop, train, and validate time-series methodologies · What are smoothing, ARMA, ARIMA, SARIMA, SRIMAX, VAR, VARMA techniques in time series and how to optimally tune parameters to yield best results · Learn how to leverage bleeding-edge techniques such as ANN, CNN, RNN, LSTM, GRU, Autoencoder to solve both Univariate and multivariate problems by using two types of data preparation methods for time series. · Univariate and multivariate problem solving using fbprophet. Who This Book Is For Data scientists, data analysts, financial analysts, and stock market researchers *Time Series with Python* Bob Mather 2020-04-13

Are you looking to learn more about Time Series, but struggling to find them in traditional Data Science textbooks? This book is your answer. Time Series is an exciting and important part of Data Analysis. Time Series Data is more readily available than most forms of data and answers questions that cross-sectional data struggle to do. It also has more real world application in the prediction of future events. However it is not generally found in a traditional data science toolkit. There is also limited centralized resources on the applications of Time Series, especially using traditional programming languages such as Python. This book solves all these problems, and more. It starts off with basic concepts in Time Series, and switches to more advanced topics. It shows you how to set up Python from start, and goes through over 20 examples of applying both simple and advanced Time Series concepts with Python code.

Time Series Analysis Univariate and Multivariate Methods - William W. S. Wei 2018-03-14

With its broad coverage of methodology, this comprehensive book is a useful learning and reference tool for those in applied sciences where analysis and research of time series is useful. Its plentiful examples show the operational details and purpose of a variety of univariate and multivariate time series methods. Numerous figures, tables and real-life time series data sets illustrate the models and methods useful for analyzing, modeling, and forecasting data collected sequentially in time. The text also offers a balanced treatment between theory and applications. Time Series Analysis is a thorough introduction to both time-domain and frequency-domain analyses of univariate and multivariate time series methods, with coverage of the most recently developed techniques in the field.

Climate Time Series Analysis - Manfred Mudelsee 2010-08-26

Climate is a paradigm of a complex system. Analysing climate data is an exciting challenge, which is increased by non-normal distributional shape, serial dependence, uneven spacing and timescale uncertainties. This book presents bootstrap resampling as a computing-intensive method able to meet the challenge. It shows the bootstrap to perform reliably in the most important statistical estimation techniques: regression, spectral analysis, extreme values and correlation. This book is written for climatologists and applied statisticians. It explains step by step the bootstrap algorithms (including novel adaptations) and methods

for confidence interval construction. It tests the accuracy of the algorithms by means of Monte Carlo experiments. It analyses a large array of climate time series, giving a detailed account on the data and the associated climatological questions. This makes the book self-contained for graduate students and researchers.

Practical Time Series Forecasting - Galit Shmueli 2011-12-08

Practical Time Series Forecasting is a hands-on introduction to quantitative forecasting of time series. Quantitative forecasting is an important component of decision making in a wide range of areas and across many business functions including economic forecasting, workload projections, sales forecasts, and transportation demand. Forecasting is also widely used also outside of business, such as in demography and climatology. The book introduces readers to the most popular statistical models and data mining algorithms used in practice. It covers issues relating to different steps of the forecasting process, from goal definition through data collection, visualization, pre-processing, modeling, performance evaluation to implementation and communication. The second edition offers a large amount of new content and improved organization. Practical Time Series Forecasting is suitable for courses on forecasting at the upper-undergraduate and graduate levels. It offers clear explanations, examples, end-of-chapter problems and a case. Methods are illustrated using XLMiner, an Excel add-on. However, any software that has time series forecasting capabilities can be used with the book. A companion website to the book is available at www.ForecastingBook.com Galit Shmueli is the SRITNE Chaired Professor of Data Analytics at the Indian School of Business. She is co-author of the textbook Data Mining for Business Intelligence and the book Modeling Online Auctions, among several other books and many publications in professional journals. She has been teaching courses on forecasting, data mining and other data analytics topics at the Indian School of Business, University of Maryland's Smith School of Business, and online at Statistics.com.

Time Series - Robert Shumway 2019-05-17

The goals of this text are to develop the skills and an appreciation for the richness and versatility of modern time series analysis as a tool for analyzing dependent data. A useful feature of the presentation is the inclusion of nontrivial data sets illustrating the richness of potential applications to problems in the biological, physical, and social sciences as well as medicine. The text presents a balanced and comprehensive treatment of both time and frequency domain methods with an emphasis on data analysis. Numerous examples using data illustrate solutions to problems such as discovering natural and anthropogenic climate change, evaluating pain perception experiments using functional magnetic resonance imaging, and the analysis of economic and financial problems. The text can be used for a one semester/quarter introductory time series course where the prerequisites are an understanding of linear regression, basic calculus-based probability skills, and math skills at the high school level. All of the numerical examples use the R statistical package without assuming that the reader has previously used the software. Robert H. Shumway is Professor Emeritus of Statistics, University of California, Davis. He is a Fellow of the American Statistical Association and has won the American Statistical Association Award for Outstanding Statistical Application. He is the author of numerous texts and served on editorial boards such as the Journal of Forecasting and the Journal of the American Statistical Association. David S. Stoffer is Professor of Statistics, University of Pittsburgh. He is a Fellow of the American Statistical Association and has won the American Statistical Association Award for Outstanding Statistical Application. He is currently on the editorial boards of the Journal of Forecasting, the Annals of Statistical Mathematics, and the Journal of Time Series Analysis. He served as a Program Director in the Division of Mathematical Sciences at the National Science Foundation and as an Associate Editor for the Journal of the American Statistical Association and the Journal of Business & Economic Statistics.

Data Mining for Business Analytics - Galit Shmueli 2019-10-14

Data Mining for Business Analytics: Concepts, Techniques, and Applications in Python presents an applied approach to data mining concepts and methods, using Python software for illustration. Readers will learn how to implement a variety of popular data mining algorithms in Python (a free and open-source software) to tackle business problems and opportunities. This is the sixth version of this successful text, and the first using Python. It covers both statistical and machine learning algorithms for prediction, classification, visualization, dimension reduction, recommender systems, clustering, text mining and network analysis. It also includes: A new co-author, Peter Gedeck, who brings

both experience teaching business analytics courses using Python, and expertise in the application of machine learning methods to the drug-discovery process. A new section on ethical issues in data mining. Updates and new material based on feedback from instructors teaching MBA, undergraduate, diploma and executive courses, and from their students. More than a dozen case studies demonstrating applications for the data mining techniques described. End-of-chapter exercises that help readers gauge and expand their comprehension and competency of the material presented. A companion website with more than two dozen data sets, and instructor materials including exercise solutions, PowerPoint slides, and case solutions. Data Mining for Business Analytics: Concepts, Techniques, and Applications in Python is an ideal textbook for graduate and upper-undergraduate level courses in data mining, predictive analytics, and business analytics. This new edition is also an excellent reference for analysts, researchers, and practitioners working with quantitative methods in the fields of business, finance, marketing, computer science, and information technology. "This book has by far the most comprehensive review of business analytics methods that I have ever seen, covering everything from classical approaches such as linear and logistic regression, through to modern methods like neural networks, bagging and boosting, and even much more business specific procedures such as social network analysis and text mining. If not the bible, it is at the least a definitive manual on the subject." —Gareth M. James, University of Southern California and co-author (with Witten, Hastie and Tibshirani) of the best-selling book An Introduction to Statistical Learning, with Applications in R

Machine Learning for Time-Series with Python - Ben Auffarth 2021-10-29

Get better insights from time-series data and become proficient in model performance analysis. Key Features: Explore popular and modern machine learning methods including the latest online and deep learning algorithms. Learn to increase the accuracy of your predictions by matching the right model with the right problem. Master time series via real-world case studies on operations management, digital marketing, finance, and healthcare. Book Description: The Python time-series ecosystem is huge and often quite hard to get a good grasp on, especially for time-series since there are so many new libraries and new models. This book aims to deepen your understanding of time series by providing a comprehensive overview of popular Python time-series packages and help you build better predictive systems. Machine Learning for Time-Series with Python starts by re-introducing the basics of time series and then builds your understanding of traditional autoregressive models as well as modern non-parametric models. By observing practical examples and the theory behind them, you will become confident with loading time-series datasets from any source, deep learning models like recurrent neural networks and causal convolutional network models, and gradient boosting with feature engineering. This book will also guide you in matching the right model to the right problem by explaining the theory behind several useful models. You'll also have a look at real-world case studies covering weather, traffic, biking, and stock market data. By the end of this book, you should feel at home with effectively analyzing and applying machine learning methods to time-series. What you will learn: Understand the main classes of time series and learn how to detect outliers and patterns. Choose the right method to solve time-series problems. Characterize seasonal and correlation patterns through autocorrelation and statistical techniques. Get to grips with time-series data visualization. Understand classical time-series models like ARMA and ARIMA. Implement deep learning models, like Gaussian processes, transformers, and state-of-the-art machine learning models. Become familiar with many libraries like Prophet, XGboost, and TensorFlow. Who this book is for: This book is ideal for data analysts, data scientists, and Python developers who want instantly useful and practical recipes to implement today, and a comprehensive reference book for tomorrow. Basic knowledge of the Python Programming language is a must, while familiarity with statistics will help you get the most out of this book.

Introduction to Time Series and Forecasting - Peter J. Brockwell 2013-03-14

Some of the key mathematical results are stated without proof in order to make the underlying theory accessible to a wider audience. The book assumes a knowledge only of basic calculus, matrix algebra, and elementary statistics. The emphasis is on methods and the analysis of data sets. The logic and tools of model-building for stationary and non-stationary time series are developed in detail and numerous exercises, many of which make use of the included computer package, provide the reader with ample opportunity to develop skills in this area. The core of the book covers stationary processes, ARMA and ARIMA processes,

multivariate time series and state-space models, with an optional chapter on spectral analysis. Additional topics include harmonic regression, the Burg and Hannan-Rissanen algorithms, unit roots, regression with ARMA errors, structural models, the EM algorithm, generalized state-space models with applications to time series of count data, exponential smoothing, the Holt-Winters and ARAR forecasting algorithms, transfer function models and intervention analysis. Brief introductions are also given to cointegration and to non-linear, continuous-time and long-memory models. The time series package included in the back of the book is a slightly modified version of the package ITSM, published separately as ITSM for Windows, by Springer-Verlag, 1994. It does not handle such large data sets as ITSM for Windows, but like the latter, runs on IBM-PC compatible computers under either DOS or Windows (version 3.1 or later). The programs are all menu-driven so that the reader can immediately apply the techniques in the book to time series data, with a minimal investment of time in the computational and algorithmic aspects of the analysis.

[Deep Learning for Coders with fastai and PyTorch](#) - Jeremy Howard
2020-06-29

Deep learning is often viewed as the exclusive domain of math PhDs and big tech companies. But as this hands-on guide demonstrates, programmers comfortable with Python can achieve impressive results in deep learning with little math background, small amounts of data, and minimal code. How? With fastai, the first library to provide a consistent interface to the most frequently used deep learning applications. Authors Jeremy Howard and Sylvain Gugger, the creators of fastai, show you how to train a model on a wide range of tasks using fastai and PyTorch. You'll also dive progressively further into deep learning theory to gain a complete understanding of the algorithms behind the scenes. Train models in computer vision, natural language processing, tabular data, and collaborative filtering Learn the latest deep learning techniques that matter most in practice Improve accuracy, speed, and reliability by understanding how deep learning models work Discover how to turn your models into web applications Implement deep learning algorithms from scratch Consider the ethical implications of your work Gain insight from the foreword by PyTorch cofounder, Soumith Chintala

[Practical Time Series Forecasting](#) - Galit Shmueli 2016-08-30

Practical Time Series Forecasting: A Hands-On Guide, Third Edition provides an applied approach to time-series forecasting. Forecasting is an essential component of predictive analytics. The book introduces popular forecasting methods and approaches used in a variety of business applications. The book offers clear explanations, practical examples, and end-of-chapter exercises and cases. Readers will learn to use forecasting methods to develop effective forecasting solutions that extract business value from time-series data. Featuring improved organization and new material, the Second Edition also includes: - Popular forecasting methods including smoothing algorithms, regression models, and neural networks - A practical approach to evaluating the performance of forecasting solutions - A business-analytics exposition focused on linking time-series forecasting to business goals - Guided cases for integrating the acquired knowledge using real data - End-of-chapter problems to facilitate active learning - A companion site with data sets, learning resources, and instructor materials (solutions to exercises, case studies) - Globally-available textbook, available in both softcover and Kindle formats Practical Time Series Forecasting: A Hands-On Guide, Third Edition is the perfect textbook for upper-undergraduate, graduate and MBA-level courses as well as professional programs in data science and business analytics. The book is also designed for practitioners in the fields of operations research, supply chain management, marketing, economics, finance and management. For more information, visit forecastingbook.com

[Introduction to Time Series Forecasting With Python](#) - Jason Brownlee
2017-02-16

Time series forecasting is different from other machine learning problems. The key difference is the fixed sequence of observations and the constraints and additional structure this provides. In this Ebook, finally cut through the math and specialized methods for time series forecasting. Using clear explanations, standard Python libraries and step-by-step tutorials you will discover how to load and prepare data, evaluate model skill, and implement forecasting models for time series data.

[Machine Learning for Time Series Forecasting with Python](#) - Francesca Lazzeri 2020-12-03

Learn how to apply the principles of machine learning to time series modeling with this indispensable resource Machine Learning for Time Series Forecasting with Python is an incisive and straightforward

examination of one of the most crucial elements of decision-making in finance, marketing, education, and healthcare: time series modeling. Despite the centrality of time series forecasting, few business analysts are familiar with the power or utility of applying machine learning to time series modeling. Author Francesca Lazzeri, a distinguished machine learning scientist and economist, corrects that deficiency by providing readers with comprehensive and approachable explanation and treatment of the application of machine learning to time series forecasting. Written for readers who have little to no experience in time series forecasting or machine learning, the book comprehensively covers all the topics necessary to: Understand time series forecasting concepts, such as stationarity, horizon, trend, and seasonality Prepare time series data for modeling Evaluate time series forecasting models' performance and accuracy Understand when to use neural networks instead of traditional time series models in time series forecasting Machine Learning for Time Series Forecasting with Python is full real-world examples, resources and concrete strategies to help readers explore and transform data and develop usable, practical time series forecasts. Perfect for entry-level data scientists, business analysts, developers, and researchers, this book is an invaluable and indispensable guide to the fundamental and advanced concepts of machine learning applied to time series modeling.

[Introduction to Time Series Analysis and Forecasting](#) - Douglas C. Montgomery 2015-04-21

Praise for the First Edition "...[t]he book is great for readers who need to apply the methods and models presented but have little background in mathematics and statistics." -MAA Reviews Thoroughly updated throughout, Introduction to Time Series Analysis and Forecasting, Second Edition presents the underlying theories of time series analysis that are needed to analyze time-oriented data and construct real-world short- to medium-term statistical forecasts. Authored by highly-experienced academics and professionals in engineering statistics, the Second Edition features discussions on both popular and modern time series methodologies as well as an introduction to Bayesian methods in forecasting. Introduction to Time Series Analysis and Forecasting, Second Edition also includes: Over 300 exercises from diverse disciplines including health care, environmental studies, engineering, and finance More than 50 programming algorithms using JMP®, SAS®, and R that illustrate the theory and practicality of forecasting techniques in the context of time-oriented data New material on frequency domain and spatial temporal data analysis Expanded coverage of the variogram and spectrum with applications as well as transfer and intervention model functions A supplementary website featuring PowerPoint® slides, data sets, and select solutions to the problems Introduction to Time Series Analysis and Forecasting, Second Edition is an ideal textbook upper-undergraduate and graduate-levels courses in forecasting and time series. The book is also an excellent reference for practitioners and researchers who need to model and analyze time series data to generate forecasts.

[Neural Networks for Time Series Forecasting with R](#) - Niels B. Lewis
2017-03-27

Finally, A Blueprint for Neural Network Time Series Forecasting with R! Neural Networks for Time Series Forecasting with R offers a practical tutorial that uses hands-on examples to step through real-world applications using clear and practical case studies. Through this process it takes you on a gentle, fun and unhurried journey to creating neural network models for time series forecasting with R. Whether you are new to data science or a veteran, this book offers a powerful set of tools for quickly and easily gaining insight from your data using R. NO EXPERIENCE REQUIRED: This book uses plain language rather than a ton of equations; I'm assuming you never did like linear algebra, don't want to see things derived, dislike complicated computer code, and you're here because you want to try neural networks for time series forecasting for yourself. YOUR PERSONAL BLUE PRINT: Through a simple to follow step by step process, you will learn how to build neural network time series forecasting models using R. Once you have mastered the process, it will be easy for you to translate your knowledge into your own powerful applications. THIS BOOK IS FOR YOU IF YOU WANT: Explanations rather than mathematical derivation Practical illustrations that use real data. Illustrations to deepen your understanding. Worked examples in R you can easily follow and immediately implement. Ideas you can actually use and try on your own data. TAKE THE SHORTCUT: This guide was written for people just like you. Individuals who want to get up to speed as quickly as possible. In this book you will learn how to: YOU'LL LEARN HOW TO: Unleash the power of Long Short-Term

Memory Neural Networks. Develop hands on skills using the Gated Recurrent Unit Neural Network. Design successful applications with Recurrent Neural Networks. Deploy Jordan and Elman Partially Recurrent Neural Networks. Adapt Deep Neural Networks for Time Series Forecasting. Master the General Method of Data Handling Type Neural Networks. For each neural network model, every step in the process is detailed, from preparing the data for analysis, to evaluating the results. These steps will build the knowledge you need to apply them to your own data science tasks. Using plain language, this book offers a simple, intuitive, practical, non-mathematical, easy to follow guide to the most successful ideas, outstanding techniques and usable solutions available using R. Everything you need to get started is contained within this book. Neural Networks for Time Series Forecasting with R is your very own hands on practical, tactical, easy to follow guide to mastery. Buy this book today and accelerate your progress!

Time Series Forecasting using Deep Learning - Ivan Gridin
2021-10-15

Explore the infinite possibilities offered by Artificial Intelligence and Neural Networks
KEY FEATURES ● Covers numerous concepts, techniques, best practices and troubleshooting tips by community experts. ● Includes practical demonstration of robust deep learning prediction models with exciting use-cases. ● Covers the use of the most powerful research toolkit such as Python, PyTorch, and Neural Network Intelligence.
DESCRIPTION This book is aimed at teaching the readers how to apply the deep learning techniques to the time series forecasting challenges and how to build prediction models using PyTorch. The readers will learn the fundamentals of PyTorch in the early stages of the book. Next, the time series forecasting is covered in greater depth after the programme has been developed. You will try to use machine learning to identify the patterns that can help us forecast the future results. It covers methodologies such as Recurrent Neural Network, Encoder-decoder model, and Temporal Convolutional Network, all of which are state-of-the-art neural network architectures. Furthermore, for good measure, we have also introduced the neural architecture search, which automates searching for an ideal neural network design for a certain task. Finally by the end of the book, readers would be able to solve complex real-world prediction issues by applying the models and strategies learnt throughout the course of the book. This book also offers another great way of mastering deep learning and its various techniques.
WHAT YOU WILL LEARN ● Work with the Encoder-Decoder concept and Temporal Convolutional Network mechanics. ● Learn the basics of neural architecture search with Neural Network Intelligence. ● Combine standard statistical analysis methods with deep learning approaches. ● Automate the search for optimal predictive architecture. ● Design your custom neural network architecture for specific tasks. ● Apply predictive models to real-world problems of forecasting stock quotes, weather, and natural processes.
WHO THIS BOOK IS FOR This book is written for engineers, data scientists, and stock traders who want to build time series forecasting programs using deep learning. Possessing some familiarity of Python is sufficient, while a basic understanding of machine learning is desirable but not needed.
TABLE OF CONTENTS 1. Time Series Problems and Challenges 2. Deep Learning with PyTorch 3. Time Series as Deep Learning Problem 4. Recurrent Neural Networks 5. Advanced Forecasting Models 6. PyTorch Model Tuning with Neural Network Intelligence 7. Applying Deep Learning to Real-world Forecasting Problems 8. PyTorch Forecasting Package 9. What is Next?

Applied Time Series Analysis - Terence C. Mills 2019-02-08

Written for those who need an introduction, Applied Time Series Analysis reviews applications of the popular econometric analysis technique across disciplines. Carefully balancing accessibility with rigor, it spans economics, finance, economic history, climatology, meteorology, and public health. Terence Mills provides a practical, step-by-step approach that emphasizes core theories and results without becoming bogged down by excessive technical details. Including univariate and multivariate techniques, Applied Time Series Analysis provides data sets and program files that support a broad range of multidisciplinary applications, distinguishing this book from others. Focuses on practical application of time series analysis, using step-by-step techniques and without excessive technical detail Supported by copious disciplinary examples, helping readers quickly adapt time series analysis to their area of study Covers both univariate and multivariate techniques in one volume Provides expert tips on, and helps mitigate common pitfalls of, powerful statistical software including EVIEWS and R Written in jargon-free and clear English from a master educator with 30 years+ experience explaining time series to novices Accompanied by a microsite with

disciplinary data sets and files explaining how to build the calculations used in examples

Data Mining for Business Analytics - Galit Shmueli 2016-04-18

An applied approach to data mining and predictive analytics with clear exposition, hands-on exercises, and real-life case studies. Readers will work with all of the standard data mining methods using the Microsoft® Office Excel® add-in XLMiner® to develop predictive models and learn how to obtain business value from Big Data. Featuring updated topical coverage on text mining, social network analysis, collaborative filtering, ensemble methods, uplift modeling and more, the Third Edition also includes: Real-world examples to build a theoretical and practical understanding of key data mining methods End-of-chapter exercises that help readers better understand the presented material Data-rich case studies to illustrate various applications of data mining techniques Completely new chapters on social network analysis and text mining A companion site with additional data sets, instructors material that include solutions to exercises and case studies, and Microsoft PowerPoint® slides <https://www.dataminingbook.com> Free 140-day license to use XLMiner for Education software Data Mining for Business Analytics: Concepts, Techniques, and Applications in XLMiner®, Third Edition is an ideal textbook for upper-undergraduate and graduate-level courses as well as professional programs on data mining, predictive modeling, and Big Data analytics. The new edition is also a unique reference for analysts, researchers, and practitioners working with predictive analytics in the fields of business, finance, marketing, computer science, and information technology. Praise for the Second Edition "...full of vivid and thought-provoking anecdotes... needs to be read by anyone with a serious interest in research and marketing." - Research Magazine "Shmueli et al. have done a wonderful job in presenting the field of data mining - a welcome addition to the literature." - ComputingReviews.com "Excellent choice for business analysts...The book is a perfect fit for its intended audience." - Keith McCormick, Consultant and Author of SPSS Statistics For Dummies, Third Edition and SPSS Statistics for Data Analysis and Visualization Galit Shmueli, PhD, is Distinguished Professor at National Tsing Hua University's Institute of Service Science. She has designed and instructed data mining courses since 2004 at University of Maryland, Statistics.com, The Indian School of Business, and National Tsing Hua University, Taiwan. Professor Shmueli is known for her research and teaching in business analytics, with a focus on statistical and data mining methods in information systems and healthcare. She has authored over 70 journal articles, books, textbooks and book chapters. Peter C. Bruce is President and Founder of the Institute for Statistics Education at www.statistics.com. He has written multiple journal articles and is the developer of Resampling Stats software. He is the author of Introductory Statistics and Analytics: A Resampling Perspective, also published by Wiley. Nitin R. Patel, PhD, is Chairman and cofounder of Cytel, Inc., based in Cambridge, Massachusetts. A Fellow of the American Statistical Association, Dr. Patel has also served as a Visiting Professor at the Massachusetts Institute of Technology and at Harvard University. He is a Fellow of the Computer Society of India and was a professor at the Indian Institute of Management, Ahmedabad for 15 years.

Hands-On Time Series Analysis with R - Rami Krispin 2019-05-31

Build efficient forecasting models using traditional time series models and machine learning algorithms. Key Features Perform time series analysis and forecasting using R packages such as Forecast and h2o Develop models and find patterns to create visualizations using the TSstudio and plotly packages Master statistics and implement time-series methods using examples mentioned Book Description Time series analysis is the art of extracting meaningful insights from, and revealing patterns in, time series data using statistical and data visualization approaches. These insights and patterns can then be utilized to explore past events and forecast future values in the series. This book explores the basics of time series analysis with R and lays the foundations you need to build forecasting models. You will learn how to preprocess raw time series data and clean and manipulate data with packages such as stats, lubridate, xts, and zoo. You will analyze data and extract meaningful information from it using both descriptive statistics and rich data visualization tools in R such as the TSstudio, plotly, and ggplot2 packages. The later section of the book delves into traditional forecasting models such as time series linear regression, exponential smoothing (Holt, Holt-Winter, and more) and Auto-Regressive Integrated Moving Average (ARIMA) models with the stats and forecast packages. You'll also cover advanced time series regression models with machine learning algorithms such as Random Forest and Gradient Boosting

Machine using the h2o package. By the end of this book, you will have the skills needed to explore your data, identify patterns, and build a forecasting model using various traditional and machine learning methods. What you will learn Visualize time series data and derive better insights Explore auto-correlation and master statistical techniques Use time series analysis tools from the stats, TSstudio, and forecast packages Explore and identify seasonal and correlation patterns Work with different time series formats in R Explore time series models such as ARIMA, Holt-Winters, and more Evaluate high-performance forecasting solutions Who this book is for Hands-On Time Series Analysis with R is ideal for data analysts, data scientists, and all R developers who are looking to perform time series analysis to predict outcomes effectively. A basic knowledge of statistics is required; some knowledge in R is expected, but not mandatory.

Machine Learning for Time Series Forecasting with Python - Francesca Lazzeri 2020-12-15

Learn how to apply the principles of machine learning to time series modeling with this indispensable resource Machine Learning for Time Series Forecasting with Python is an incisive and straightforward examination of one of the most crucial elements of decision-making in finance, marketing, education, and healthcare: time series modeling. Despite the centrality of time series forecasting, few business analysts are familiar with the power or utility of applying machine learning to time series modeling. Author Francesca Lazzeri, a distinguished machine learning scientist and economist, corrects that deficiency by providing readers with comprehensive and approachable explanation and treatment of the application of machine learning to time series forecasting. Written for readers who have little to no experience in time series forecasting or machine learning, the book comprehensively covers all the topics necessary to: Understand time series forecasting concepts, such as stationarity, horizon, trend, and seasonality Prepare time series data for modeling Evaluate time series forecasting models' performance and accuracy Understand when to use neural networks instead of traditional time series models in time series forecasting Machine Learning for Time Series Forecasting with Python is full real-world examples, resources and concrete strategies to help readers explore and transform data and develop usable, practical time series forecasts. Perfect for entry-level data scientists, business analysts, developers, and researchers, this book is an invaluable and indispensable guide to the fundamental and advanced concepts of machine learning applied to time series modeling.

Statistics in Volcanology - Jeffrey M. Mader 2006

Statistics in Volcanology is a comprehensive guide to modern statistical methods applied in volcanology written by today's leading authorities. The volume aims to show how the statistical analysis of complex volcanological data sets, including time series, and numerical models of volcanic processes can improve our ability to forecast volcanic eruptions. Specific topics include the use of expert elicitation and Bayesian methods in eruption forecasting, statistical models of temporal and spatial patterns of volcanic activity, analysis of time series in volcano seismology, probabilistic hazard assessment, and assessment of numerical models using robust statistical methods. Also provided are comprehensive overviews of volcanic phenomena, and a full glossary of both volcanological and statistical terms. Statistics in Volcanology is essential reading for advanced undergraduates, graduate students, and research scientists interested in this multidisciplinary field.

Time Series Analysis and Forecasting by Example - Søren Bisgaard 2011-08-24

An intuition-based approach enables you to master time series analysis with ease Time Series Analysis and Forecasting by Example provides the fundamental techniques in time series analysis using various examples. By introducing necessary theory through examples that showcase the discussed topics, the authors successfully help readers develop an intuitive understanding of seemingly complicated time series models and their implications. The book presents methodologies for time series analysis in a simplified, example-based approach. Using graphics, the authors discuss each presented example in detail and explain the

relevant theory while also focusing on the interpretation of results in data analysis. Following a discussion of why autocorrelation is often observed when data is collected in time, subsequent chapters explore related topics, including: Graphical tools in time series analysis Procedures for developing stationary, non-stationary, and seasonal models How to choose the best time series model Constant term and cancellation of terms in ARIMA models Forecasting using transfer function-noise models The final chapter is dedicated to key topics such as spurious relationships, autocorrelation in regression, and multiple time series. Throughout the book, real-world examples illustrate step-by-step procedures and instructions using statistical software packages such as SAS®, JMP, Minitab, SCA, and R. A related Web site features PowerPoint slides to accompany each chapter as well as the book's data sets. With its extensive use of graphics and examples to explain key concepts, Time Series Analysis and Forecasting by Example is an excellent book for courses on time series analysis at the upper-undergraduate and graduate levels. It also serves as a valuable resource for practitioners and researchers who carry out data and time series analysis in the fields of engineering, business, and economics.

Handbook of Financial Time Series - Torben Gustav Andersen 2009-04-21

The Handbook of Financial Time Series gives an up-to-date overview of the field and covers all relevant topics both from a statistical and an econometrical point of view. There are many fine contributions, and a preamble by Nobel Prize winner Robert F. Engle.

Practical Machine Learning for Data Analysis Using Python - Abdulhamit Subasi 2020-06-05

Practical Machine Learning for Data Analysis Using Python is a problem solver's guide for creating real-world intelligent systems. It provides a comprehensive approach with concepts, practices, hands-on examples, and sample code. The book teaches readers the vital skills required to understand and solve different problems with machine learning. It teaches machine learning techniques necessary to become a successful practitioner, through the presentation of real-world case studies in Python machine learning ecosystems. The book also focuses on building a foundation of machine learning knowledge to solve different real-world case studies across various fields, including biomedical signal analysis, healthcare, security, economics, and finance. Moreover, it covers a wide range of machine learning models, including regression, classification, and forecasting. The goal of the book is to help a broad range of readers, including IT professionals, analysts, developers, data scientists, engineers, and graduate students, to solve their own real-world problems. Offers a comprehensive overview of the application of machine learning tools in data analysis across a wide range of subject areas Teaches readers how to apply machine learning techniques to biomedical signals, financial data, and healthcare data Explores important classification and regression algorithms as well as other machine learning techniques Explains how to use Python to handle data extraction, manipulation, and exploration techniques, as well as how to visualize data spread across multiple dimensions and extract useful features

Analysis of Financial Time Series - Ruey S. Tsay 2010-10-26

This book provides a broad, mature, and systematic introduction to current financial econometric models and their applications to modeling and prediction of financial time series data. It utilizes real-world examples and real financial data throughout the book to apply the models and methods described. The author begins with basic characteristics of financial time series data before covering three main topics: Analysis and application of univariate financial time series The return series of multiple assets Bayesian inference in finance methods Key features of the new edition include additional coverage of modern day topics such as arbitrage, pair trading, realized volatility, and credit risk modeling; a smooth transition from S-Plus to R; and expanded empirical financial data sets. The overall objective of the book is to provide some knowledge of financial time series, introduce some statistical tools useful for analyzing these series and gain experience in financial applications of various econometric methods.