

Periodicity In Time Series Of Wind Direction Data

This book presents selected peer-reviewed contributions from the International Work-Conference on Time Series, ITISE 2017, held in Granada, Spain, September 18-20, 2017. It discusses topics in time series analysis and forecasting, including advanced mathematical methodology, computational intelligence methods for time series, dimensionality reduction and similarity measures, econometric models, energy time series forecasting, forecasting in real problems, online learning in time series as well as high-dimensional and complex/big data time series. The series of ITISE conferences provides a forum for scientists, engineers, educators and students to discuss the latest ideas and implementations in the foundations, theory, models and applications in the field of time series analysis and forecasting. It focuses on interdisciplinary and multidisciplinary research encompassing computer science, mathematics, statistics and econometrics.

Large Scale and Big Data: Processing and Management provides readers with a central source of reference on the data management techniques currently available for large-scale data processing. Presenting chapters written by leading researchers, academics, and practitioners, it addresses the fundamental challenges associated with Big Data processing tools and techniques across a range of computing environments. The book begins by discussing the basic concepts and tools of large-scale Big Data processing and cloud computing. It also provides an overview of different programming models and cloud-based deployment models. The book's second section examines the usage of advanced Big Data processing techniques in different domains, including semantic web, graph processing, and stream processing. The third section discusses advanced topics of Big Data processing such as consistency management, privacy, and security. Supplying a comprehensive summary from both the research and applied perspectives, the book covers recent research discoveries and applications, making it an ideal reference for a wide range of audiences, including researchers and academics working on databases, data mining, and web scale data processing. After reading this book, you will gain a fundamental understanding of how to use Big Data-processing tools and techniques effectively across application domains. Coverage includes cloud data management architectures, big data analytics visualization, data management, analytics for vast amounts of unstructured data, clustering, classification, link analysis of big data, scalable data mining, and machine learning techniques.

The book is a summary of a time series forecasting competition that was held a number of years ago. It aims to provide a snapshot of the range of new techniques that are used to study time series, both as a reference for experts and as a guide for novices.

In this insightful, modern study of the use of periodic models in the description and forecasting of economic data the authors investigate such areas as seasonal time series, periodic time series models, periodic integration and periodic cointegration.

Fourier Analysis of Time Series

Time series analysis of biologging data

Foundations of Intelligent Systems
2018 IEEE Recent Advances in Intelligent Computational Systems (RAICS).
Theory, Algorithms, and Applications
This book provides an essential appraisal of the recent advances in technologies, mathematical models and computational software used by those working with geodetic data. It explains the latest methods in processing and analyzing geodetic time series data from various space missions (i.e. GNSS, GRACE) and other technologies (i.e. tide gauges), using the most recent mathematical models. The book provides practical examples of how to apply these models to estimate seal level rise as well as rapid and evolving land motion changes due to gravity (ice sheet loss) and earthquakes respectively. It also provides a necessary overview of geodetic software and where to obtain them.
This volume contains the 137 papers accepted for presentation at the 15th European Conference on Artificial Intelligence (ECAI'02), which is organized by the European Co-ordination Committee on Artificial Intelligence.
Economic Time Series: Modeling and Seasonality is a focused resource on analysis of economic time series as pertains to modeling and seasonality, presenting cutting-edge research that would otherwise be scattered throughout diverse peer-reviewed journals. This compilation of 21 chapters showcases the cross-fertilization between the fields of time series modeling and seasonal adjustment, as is reflected both in the contents of the chapters and in their authorship, with contributors coming from academia and government statistical agencies. For easier perusal and absorption, the contents have been grouped into seven topical sections: Section I deals with periodic modeling of time series, introducing, applying, and comparing various seasonally periodic models Section II examines the estimation of time series components when models for series are misspecified in some sense, and the broader implications this has for seasonal adjustment and business cycle estimation Section III examines the quantification of error in X-11 seasonal adjustments, with comparisons to error in model-based seasonal adjustments Section IV discusses some practical problems that arise in seasonal adjustment: developing asymmetric trend-cycle filters, dealing with both temporal and contemporaneous benchmark constraints, detecting trading-day effects in monthly and quarterly time series, and using diagnostics in conjunction with model-based seasonal adjustment Section V explores outlier detection and the modeling of time series containing extreme values, developing new procedures and extending previous work Section VI examines some alternative models and inference procedures for analysis of seasonal economic time series Section VII deals with aspects of modeling, estimation, and forecasting for nonseasonal economic time series By presenting new methodological developments as well as pertinent empirical analyses and reviews of established methods, the book provides much that is stimulating and practically useful for the serious researcher and analyst of economic time series.
Periodicity and Stochastic Trends in Economic Time SeriesOxford University Press, USA
Analysis of Poisson count time series with unknown periodicity
4th ECML PKDD Workshop, AALTD 2019, Würzburg, Germany, September 20, 2019, Revised Selected Papers
Processing and Management

Approaches for Validating Frequent Episodes Based on Periodicity in Time-series Data

15th European Conference on Artificial Intelligence, July 21-26, 2002, Lyon France : Including Prestigious Applications of Intelligent Systems (PAIS 2002) : Proceedings

6th International Conference, RSKT 2011, Banff, Canada, October 9-12, 2011, Proceedings

A new, revised edition of a yet unrivaled work on frequencydomain analysis Long recognized for his unique focus on frequency domain methodsfor the analysis of time series data as well as for his applied,easy-to-understand approach, Peter Bloomfield brings his well-known1976 work thoroughly up to date. With a minimum of mathematics andan engaging, highly rewarding style, Bloomfield provides in-depthdiscussions of harmonic regression, harmonic analysis, complexdemodulation, and spectrum analysis. All methods are clearlyillustrated using examples of specific data sets, while ampleexercises acquaint readers with Fourier analysis and itsapplications. The Second Edition: Devotes an entire chapter to complex demodulation Treats harmonic regression in two separate chapters Features a more succinct discussion of the fast Fouriertransform Uses S-PLUS commands (replacing FORTRAN) to accommodateprogramming needs and graphic flexibility Includes Web addresses for all time series data used in theexamples An invaluable reference for statisticians seeking to expandtheir understanding of frequency domain methods, FourierAnalysis of Time Series, Second Edition also provides easyaccess to sophisticated statistical tools for scientists andprofessionals in such areas as atmospheric science, oceanography,climatology, and biology.

This book presents the principles and methods for the practical analysis and prediction of economic and financial time series. It covers decomposition methods, autocorrelation methods for univariate time series, volatility and duration modeling for financial time series, and multivariate time series methods, such as cointegration and recursive state space modeling. It also includes numerous practical examples to demonstrate the theory using real-world data, as well as exercises at the end of each chapter to aid understanding. This book serves as a reference text for researchers, students and practitioners interested in time series, and can also be used for university courses on econometrics or computational finance.

Load curve data is a type of time series data which records the electric energy consumptions at time points and plays an important role in operation and planning of power systems. Unfortunately, load curves always contain abnormal, noisy, unrepresentative and missing data due to various random factors. It is crucial to power systems to identify and repair corrupted and unrepresentative data before load curve data can be used for planning and modeling. In this thesis we present a new class of X-outliers that have abnormal power consumption levels related to periodicity (X-axis) and propose a novel solution to detect these outliers. The underlying assumption is that the data set follows a periodicity and the length (not the pattern) of the periodicity is known. This is the case for most real load curve data collected at BC Hydro. In the above the periodicity is assumed to be known for X-outlier detection. In some other applications, however, the periodicity needs to be discovered. The latter is the case when the periodicity evolves, when a new time series is collected, or when conditions that affect time series have changed. Periodicity detection for time series has important applications in forecasting, planning, trend detection, and outlier detection. For time series with unknown periodicity, X-outlier detection could still be performed after the periodicity is detected. Thus X-outlier detection and periodicity detection are highly related and periodicity detection could be considered as a pre-processing step of X-outlier detection for time series with unknown periodicity. Therefore, in this thesis, we also propose a trend based periodicity detection algorithm for time series data with unknown periodicity. This approach is trend preserving and noise resilient. Real load curve data in the BC Hydro system is used to demonstrate the effectiveness and accuracy of the proposed methods.

The theory of mean periodic functions is a subject which goes back to works of Littlewood, Delsarte, John and that has undergone a vigorous development in recent years. There has been much progress in a number of problems concerning local - pects of spectral analysis and spectral synthesis on homogeneous spaces. The study oftheseproblemsturnsouttobe closelyrelatedtoavarietyofquestionsinharmonic analysis, complex analysis, partial differential equations, integral geometry, appr- imation theory, and other branches of contemporary mathematics. The present book describes recent advances in this direction of research. Symmetric spaces and the Heisenberg group are an active ?eld of investigation at 2 the moment. The simplest examples of symmetric spaces, the classical 2-sphere S 2 and the hyperbolic plane H , play familiar roles in many areas in mathematics. The n Heisenberg groupH is a principal model for nilpotent groups, and results obtained n forH may suggest results that hold more generally for this important class of Lie groups. The purpose of this book is to develop harmonic analysis of mean periodic functions on the above spaces.

Advances in Knowledge Discovery and Data Mining

Periodic Time Series Models

Geodetic Time Series Analysis in Earth Sciences

Proceedings of ICAEES 2014, Volume 1

Singular Spectrum Analysis for Time Series

Periodic Systems

The book is a collection of high-quality peer-reviewed research papers presented in Proceedings of International Conference on Artificial Intelligence and Evolutionary Algorithms in Engineering Systems (ICAEEES 2014) held at Noorul Islam Centre for Higher Education,

Kumaracoil, India. These research papers provide the latest developments in the broad area of use of artificial intelligence and evolutionary algorithms in engineering systems. The book discusses wide variety of industrial, engineering and scientific applications of the

emerging techniques. It presents invited papers from the inventors/originators of new applications and advanced technologies.

This book offers a comprehensive treatment of the theory of periodic systems, including the problems of filtering and control. It covers an array of topics, presenting an overview of the field and focusing on discrete-time signals and systems.

Of Testing ExperimentsConclusion; Acknowledgments; References; Can Relational Learning Scale Up?. Introduction; Phase Transition in Hypothesis Testing; Experiment Goal and Setting; Results; Interpretation; The Phase Transition Is an Attractor; Correct Identification of the

Target Concept; Good Approximation of the Target Concept; Conclusion; References; Discovering Geographic Knowledge: The INGENS System; Introduction; INGENS Software Architecture and Object Data Model; Learning Classification Rules for Geographical Objects; Application to

Apulian Map Interpretation.

Since 1967, the main scientific events of the General Assemblies of the International Astronomical Union have been published in the separate series, Highlights of Astronomy. The present Volume 11 presents the major scientific presentations made at the XXIIIrd General

Assembly, August 18-30, 1997, in Kyoto, Japan. The two volumes (11A + B) contain the text of the three Invited Discourses as well as the proceedings or extended summaries of the 21 Joint Discussions and two Special Sessions held during the General Assembly.

Forecasting The Future And Understanding The Past

Sequence Data Mining

As Presented at the XXIIIrd General Assembly of the IAU, 1997

Modeling and Seasonality

Autoregressive Models for Periodicity Detection in DNA Microarray Time Series Data

Time Series Prediction

There is ongoing research on sequence mining of time-series data. We study Hybrid Apriori, an interval-based approach to episode discovery that deals with different periodicities in time-series data. Our study identifies the anomaly in the Hybrid Apriori by confirming the false positives in the frequent episodes discovered. The anomaly is due to the frequent episodes in order to compress data. We propose a main memory based solution to distinguish the false positives from the true frequent episodes. Our algorithm to validate the frequent episodes has several alternatives such as the naive approach, the partitioned approach and the parallel approach in order to minimize the overhead of validation. We generalize our approach to different periodicities. We discuss the advantages and disadvantages of each approach and do extensive experiments to demonstrate the performance and scalability of each approach.

This book provides a self-contained account of periodic models for seasonally observed economic time series with stochastic trends. Two key concepts are periodic integration and periodic cointegration. Periodic integration implies that a seasonally varying differencing filter is required to remove a stochastic trend. Periodic cointegration implies that the parameters to vary with the season. The emphasis is on useful econrameters and shometric models that explicitly describe seasonal variation and can reasonably be interpreted in terms of economic behaviour. The analysis considers econometric theory, Monte Carlo simulation, and forecasting, and it is illustrated with numerous empirical time series. Seasonally changing seasonal fluctuations depend on the trend and business cycle fluctuations. In the case of such dependence, it is shown that seasonal adjustment leads to inappropriate results.

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 treatment of forecasting. It presents enough information about each method for readers to use them sensibly.

Understanding sequence data, and the ability to utilize this hidden knowledge, will create a significant impact on many aspects of our society. Examples of sequence data include DNA, protein, customer purchase history, web surfing history, and more. This book provides thorough coverage of the existing results on sequence data mining and forecasting. It offers balanced coverage on data mining and sequence data analysis, allowing readers to access the state-of-the-art results in one place.

Algorithms and Data Structures for External Memory

Economic Time Series

Filtering and Control

Artificial Intelligence and Evolutionary Algorithms in Engineering Systems

Forecasting: principles and practice

Time Series Analysis and Forecasting

Singular spectrum analysis (SSA) is a technique of time series analysis and forecasting combining elements of classical time series analysis, multivariate statistics, multivariate geometry, dynamical systems and signal processing. SSA seeks to decompose the original series into a sum of a small number of interpretable components such as trend, oscillatory components and noise. It is based on the singular value decomposition of a specific matrix constructed upon the time series. Neither a parametric model nor stationarity are assumed for the time series. This makes SSA a model-free method and hence enables SSA to have a very wide range of applicability. The present book is devoted to the methodology of SSA and shows how to use SSA both safely and with maximum effect. Potential readers of the book include: professional statisticians and econometricians, specialists in any discipline in which problems of time series analysis and forecasting occur, specialists in signal processing and those needed to extract signals from noisy data, and students taking courses on applied time series analysis.

"Contains over 2500 equations and exhaustively covers not only nonparametrics but also parametric, semiparametric, frequentist, Bayesian, bootstrap, adaptive, univariate, and multivariate statistical methods, as well as practical uses of Markov chain models."

This book provides an introduction to the field of periodic pattern mining, reviews state-of-the-art techniques, discusses recent advances, and reviews open-source software. Periodic pattern mining is a popular and emerging research area in the field of data mining. It involves discovering all regularly occurring patterns in temporal databases. One of the major applications of periodic pattern mining is the analysis of customer transaction databases to discover sets of items that have been regularly purchased by customers. Discovering such patterns has several implications for understanding the behavior of customers. Since the first work on periodic pattern mining, numerous studies have been published and great advances have been made in this field. The book consists of three main parts: introduction, algorithms, and applications. The first chapter is an introduction to pattern mining and periodic pattern mining. The concepts of periodicity, periodic support, search space exploration techniques, and pruning strategies are discussed. The main types of algorithms are also presented such as periodic-frequent pattern growth, partial periodic pattern-growth, and periodic high-utility itemset mining algorithm. Challenges and research opportunities are reviewed. The chapters that follow present state-of-the-art techniques for discovering periodic patterns in (1) transactional databases, (2) temporal databases, (3) quantitative temporal databases, and (4) big data. Then, the theory on concise representations of periodic patterns is presented, as well as hiding sensitive information using privacy-preserving data mining techniques. The book concludes with several applications of periodic pattern mining, including applications in air pollution data analytics, accident data analytics, and traffic congestion analytics.

This book considers periodic time series models for seasonal data, characterized by parameters that differ across the seasons, and focuses on their usefulness for out-of-sample forecasting. Providing an up-to-date survey of the recent developments in periodic time series, the book presents a large number of empirical results. The first part of the book deals with model selection, diagnostic checking and forecasting of univariate periodic autoregressive models. Tests for periodic integration, are discussed, and an extensive discussion of the role of deterministic regressors in testing for periodic integration and in forecasting is provided. The second part discusses multivariate periodic autoregressive models. It provides an overview of periodic cointegration models, as these are the most relevant. This overview contains single-equation type tests and a full-system approach based on generalized method of moments. All methods are illustrated with extensive examples, and the book will be of interest to advanced graduate students and researchers in econometrics, as well as practitioners looking for an understanding of how to approach seasonal data.

Periodic Pattern Mining**Time Series Modelling with Unobserved Components****Selected Contributions from ITISE 2017****Time Series with Mixed Spectra****Harmonic Analysis of Mean Periodic Functions on Symmetric Spaces and the Heisenberg Group****Periodicity, Non-stationarity, and Forecasting of Economic and Financial Time Series**

Artificial Intelligence, Autonomous Systems, Big Data Processing, Biomedical Technologies, Biotechnology, Building Technologies, Chemical, Biological, Radiological and Nuclear Defense, Criminal and Forensic Science, Cognitive Systems, Current Issues and Challenges in Innovation, Environmental Chemistry and Toxicology, Fuel Cell and Water Splitter, Geographic Information System, Green Energy and Green Technology, Grid and Cloud Computing, Intellectual Property Rights, Intelligent Communications and Networks, Laser and Photonic, Lean Manufacturing Technologies, Machine Learning Technologies, Material Technologies and Secondary Process, Microfluidics, Nanotechnology and Material Sciences, Nano and MicroElectro Mechanical Systems, Nuclear Science and Techniques, Polymer Science, Recycling Technologies, Simulation Technologies, Smart Grid, Space Application, Terahertz Spectroscopy and Applications, Weapon and Ammunition Systems, Unmanned Aerial Vehicle, Virtual Reality

Despite the unobserved components model (UCM) having many advantages over more popular forecasting techniques based on regression analysis, exponential smoothing, and ARIMA, the UCM is not well known among practitioners outside the academic community. Time Series Modelling with Unobserved Components rectifies this deficiency by giving a practical o This book constitutes the refereed proceedings of the 6th International Conference on Rough Sets and Knowledge Technology, RSKT 2011, held in Banff, Canada, in September 2011. The 89 revised full papers presented together with 3 keynote lectures and 1 invited tutorial session were carefully reviewed and selected from 229 submissions. The papers are organized in topical sections on attribute reduction and feature selection, generalized rough set models, machine learning with rough and hybrid techniques, knowledge technology and intelligent systems and applications.

This book constitutes the refereed proceedings of the 4th ECML PKDD Workshop on Advanced Analytics and Learning on Temporal Data, AALTD 2019, held in Würzburg, Germany, in September 2019. The 7 full papers presented together with 9 poster papers were carefully reviewed and selected from 31 submissions. The papers cover topics such as temporal data clustering; classification of univariate and multivariate time series; early classification of temporal data; deep learning and learning representations for temporal data; modeling temporal dependencies; advanced forecasting and prediction models; space-temporal statistical analysis; functional data analysis methods; temporal data streams; interpretable time-series analysis methods; dimensionality reduction, sparsity, algorithmic complexity and big data challenge; and bio-informatics, medical, energy consumption, on temporal data.

Mining Asynchronous Periodic Patterns in Time Series Data**12th International Symposium, ISMIS 2000, Charlotte, NC, USA October 11-14, 2000 Proceedings****Asymptotics, Nonparametrics, and Time Series****Rough Set and Knowledge Technology****ECAI 2002****autocorrelation reveals periodicity of diving behaviour in macaroni penguins**

Describes several useful paradigms for the design and implementation of efficient external memory (EM) algorithms and data structures. The problem domains considered include sorting, permuting, FFT, scientific computing, computational geometry, graphs, databases, geographic information systems, and text and string processing.

Written at a readily accessible level, Basic Data Analysisfor Time Series with R emphasizes the mathematical importanceof collaborative analysis of data used to collect increments oftime or space. Balancing a theoretical and practical approach toanalyzing data within the context of serial correlation, the bookpresents a coherent and systematic regression-based approach tomodel selection. The book illustrates these principles ofmodel selection and model building through the use of informationcriteria, cross validation, hypothesis tests, and confidenceintervals. Focusing on frequency- and time-domain and trigonometricregression as the primary themes, the book also includes moderntopical coverage on Fourier series and Akaike's InformationCriterion (AIC). In addition, Basic Data Analysis for TimeSeries with R also features: Real-world examples to provide readers with practical hands-onexperience Multiple R software subroutines employed with graphicaldisplays Numerous exercise sets intended to support readersunderstanding of the core concepts Specific chapters devoted to the analysis of the Wolf sunspotnumber data and the Vostok ice core data sets

Abstract: "Periodicity detection in time series data is a challenging problem of great importance in many applications. Most previous work focused on mining synchronous periodic patterns and did not recognize misaligned presence of a pattern due to the intervention of random noise. In this paper, we propose a more flexible model of asynchronous periodic pattern that may be present only within a subsequence and whose occurrences may be shifted due to disturbance. Two parameters \min rep and \max dis are employed to specify the minimum number of repetitions that is required within each segment of non-disrupted pattern occurrences and the maximum allowed disturbance between any two successive valid segments. Upon satisfying these two requirements, the longest valid subsequence of a pattern is returned. A two phase algorithm is devised to first generate potential periods by distance-based pruning followed by an iterative procedure to derive and validate candidate patterns and locate the longest valid subsequence. We also show that this algorithm can not only provide linear time complexity with respect to the length of the sequence but also achieve space efficiency."

Time series with mixed spectra are characterized by hidden periodic components buried in random noise. Despite strong interest in the statistical and signal processing communities, no book offers a comprehensive and up-to-date treatment of the subject. Filling this void, Time Series with Mixed Spectra focuses on the methods and theory for the statistical analysis of time series with mixed spectra. It presents detailed theoretical and empirical analyses of important methods and algorithms. Using both simulated and real-world data to illustrate the analyses, the book discusses periodogram analysis, autoregression, maximum likelihood, and covariance analysis. It considers real- and complex-valued time series, with and without the Gaussian assumption. The author also includes the most recent results on the Laplace and quantile periodograms as extensions of the traditional periodogram. Complete in breadth and depth, this book explains how to perform the spectral analysis of time series data to detect and estimate the hidden periodicities represented by the sinusoidal functions. The book not only extends results from the existing literature but also contains original material, including the asymptotic theory for closely spaced frequencies and the proof of asymptotic normality of the nonlinear least-absolute-deviations frequency estimator.

Applied Modeling of Hydrologic Time Series**An Introduction****Periodicity and Stochastic Trends in Economic Time Series****Estimation of Periodicity in Time Series by Ordinal Analysis with Application to Speech****X-outlier Detection and Periodicity Detection in Load Curve Data in Power Systems****15th Pacific-Asia Conference, PAKDD 2011, Shenzhen, China, May 24-27, 2011, Proceedings, Part II**

The two-volume set LNAI 6634 and 6635 constitutes the refereed proceedings of the 15th Pacific-Asia Conference on Knowledge Discovery and Data Mining, PAKDD 2011, held in Shenzhen, China in May 2011. The total of 32 revised full papers and 58 revised short papers were carefully reviewed and selected from 331 submissions. The papers present new ideas, original research results, and practical development experiences from all KDD-related areas including data mining, machine learning, artificial intelligence and pattern recognition, data warehousing and databases, statistics, knowledge engineering, behavior sciences, visualization, and emerging areas such as social network analysis.

Time Series in Economics and Finance**Advanced Analytics and Learning on Temporal Data****Highlights of Astronomy, Volume 11A****2019 3rd International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT)****Watershed Hydrology****Large Scale and Big Data**