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Theory and Practice of Computation - Proceedings of Workshop on Computation Shin-ya Nishizaki 2015-11-30

Handbook of Drought and Water Scarcity Saeid Eslamian 2017-08-02 This volume include over 30 chapters, written by experts from around the world. It examines drought and all of the fundamental principles relating to drought and water scarcity. It includes coverage of the causes of drought, occurences, preparations, drought vulnerability assessments, societal implications, and more.

Assessment of Intraseasonal to Interannual Climate Prediction and Predictability National Research Council 2010-09-08 More accurate forecasts of climate conditions over time periods of weeks to a few years could help people plan agricultural activities, mitigate drought, and manage energy resources, amongst other activities; however, current forecast systems have limited ability on these time- scales. Models for such climate forecasts must take into account complex interactions among the ocean, atmosphere, and land surface. Such processes can be difficult to represent realistically. To improve the quality of forecasts, this book makes recommendations about the development of the tools used in forecasting and about specific research goals for improving understanding of sources of predictability. To improve the accessibility of these forecasts to decision-makers and researchers, this book also suggests best practices to improve how forecasts are made and disseminated.

Hidden Markov Models for Time Series Walter Zucchini 2017-12-19 Hidden Markov Models for Time Series: An Introduction Using R, Second Edition illustrates the great flexibility of hidden Markov models (HMMs) as general-purpose models for time series data. The book provides a broad understanding of the models and their uses. After presenting the basic model formulation, the book covers

estimation, forecasting, decoding, prediction, model selection, and Bayesian inference for HMMs. Through examples and applications, the authors describe how to extend and generalize the basic model so that it can be applied in a rich variety of situations. The book demonstrates how HMMs can be applied to a wide range of types of time series: continuous-valued, circular, multivariate, binary, bounded and unbounded counts, and categorical observations. It also discusses how to employ the freely available computing environment R to carry out the computations. Features Presents an accessible overview of HMMs Explores a variety of applications in ecology, finance, epidemiology, climatology, and sociology Includes numerous theoretical and programming exercises Provides most of the analysed data sets online New to the second edition A total of five chapters on extensions, including HMMs for longitudinal data, hidden semi-Markov models and models with continuous-valued state process New case studies on animal movement, rainfall occurrence and capture-recapture data

Operational Flood Forecasting, Warning and Response for Multi-Scale Flood Risks in Developing Cities María Carolina Rogelis 2020-04-22 The aim of this book is to contribute to understanding risk knowledge and to forecasting components of early flood warning, particularly in the environment of tropical high mountains in developing cities. This research covers a challenge, taking into account the persistent lack of data, limited resources and often complex climatic, hydrologic and hydraulic conditions. In this research, a regional method is proposed for assessing flash flood susceptibility and for identifying debris flow predisposition at the watershed scale. An indication of hazard is obtained from the flash flood susceptibility analysis and continually, the vulnerability and an indication of flood risk at watershed scale was obtained. Based on risk analyses, the research follows the modelling steps for flood forecasting development. Input precipitation is addressed in the environment of complex topography commonly found in mountainous tropical areas. A distributed model, a semi-distributed model and a lumped model were all used to simulate the discharges of a tropical high mountain basin with a páramo upper basin. Performance analysis and diagnostics were carried out in order to identify the most appropriate model for the study area for flood early warning. Finally, the Weather Research and Forecasting (WRF) model was used to explore the added value of numerical weather models for flood early warning in a páramo area.

Rainfall Time Series Modeling for a Mountainous Region in West Iran Fatemeh Mekanik 2010 One of the major problems of water resources management is rainfall forecasting. Different linear and non-linear methods have been used in order to have an accurate forecast. Whilst there are some debates on whether the use of linear or non-linear techniques is better, it was found that rainfall modelling for the short term period is receiving more attention than those for long-term periods. This study gives attention to long-term rainfall modelling since long-term forecasting could provide better data for optimal management of a resource that is to be used over a substantial period of time. Hence, this study is to investigate the effect of linear and non-linear techniques on long-term rainfall forecasting. One of the non-linear techniques being widely used is the Artificial Neural Networks (ANN) approach which has

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the ability of mapping between input and output patterns without a priori knowledge of the system being modelled. The more popular linear techniques include the Box-Jenkins family of models. A feedforward Artificial Neural Network (ANN) rainfall model and a Seasonal Autoregressive Integrated Moving Average (SARIMA) rainfall model were developed to investigate their potentials in forecasting rainfall. The study area is the west mountainous region of Iran. Three meteorological stations among the several stations over the region were chosen as case study. The stations are the Hamedan Foroudgah, Nujeh, and Arak. Three different ANN models with three different input sets were trained. The first model investigated the effect of number of lags on the performance of the ANN. The number of lags varied from 1-12 previous months. The second model investigated the effect of adding monthly average to the inputs, and the third model considered seasonal average as an extra input in addition to the ones in the second model. The effect of the number of hidden nodes on ANN modeling was also examined. The preliminary inputs for SARIMA were found by examining the Autocorrelation and Partial Autocorrelation of the series. The 26 years monthly rainfall of 1977-2002 was used for training the models. The ANN models were trained and simulated using a program written in MATLAB environment (M-file). The SARIMA models were developed using SPSS syntax. The models were tested with one year monthly rainfall of 2003. It was proven that the larger lags outperform the lower ones in ANN modeling. Also, adding the extra monthly and seasonal average to the input set leads to better model performance. The number of hidden nodes was varied from 1-30. It was demonstrated that input nodes have more effect on performance criteria than the hidden nodes. The models were trained based on the Levenberg-Marquardt algorithm with tansigmoid activation function for the hidden layer and purelin activation function for the output layer. Simulation results for the independent testing data series showed that the model can perform well in simulating one year monthly rainfall in advance .The SARIMA models were built using the same set of data as for the ANN. Model selection was done among multiplicative and additive models and the results revealed that additive SARIMA models have the best performance. The simulation results from the ANN and SARIMA model showed that the SARIMA model has a better performance both in training and testing. Thus, it is recommended for modeling rainfall in the region.

Flood Forecasting Using Machine Learning Methods Fi-John Chang 2019-02-28 Nowadays, the degree and scale of flood hazards has been massively increasing as a result of the changing climate, and large-scale floods jeopardize lives and properties, causing great economic losses, in the inundation-prone areas of the world. Early flood warning systems are promising countermeasures against flood hazards and losses. A collaborative assessment according to multiple disciplines, comprising hydrology, remote sensing, and meteorology, of the magnitude and impacts of flood hazards on inundation areas significantly contributes to model the integrity and precision of flood forecasting. Methodologically oriented countermeasures against flood hazards may involve the forecasting of reservoir inflows, river flows, tropical cyclone tracks, and flooding at different lead times and/or scales. Analyses of impacts, risks, uncertainty, resilience, and scenarios coupled with policy-oriented suggestions

will give information for flood hazard mitigation. Emerging advances in computing technologies coupled with big-data mining have boosted data-driven applications, among which Machine Learning technology, with its flexibility and scalability in pattern extraction, has modernized not only scientific thinking but also predictive applications. This book explores recent Machine Learning advances on flood forecast and management in a timely manner and presents interdisciplinary approaches to modelling the complexity of flood hazards-related issues, with contributions to integrative solutions from a local, regional or global perspective.

Operational Weather Forecasting Peter Michael Inness 2012-12-06 This book offers a complete primer, covering the end-to-endprocess of forecast production, and bringing together a descriptionof all the relevant aspects together in a single volume; withplenty of explanation of some of the more complex issues andexamples of current, state-of-the-art practices. Operational Weather Forecasting covers the whole processof forecast production, from understanding the nature of theforecasting problem, gathering the observational data with which toinitialise and verify forecasts, designing and building a model (ormodels) to advance those initial conditions forwards in time andthen interpreting the model output and putting it into a form whichis relevant to customers of weather forecasts. Included is thegeneration of forecasts on the monthly-to-seasonal timescales,often excluded in text-books despite this type of forecastinghaving been undertaken for several years. This is a rapidly developing field, with a lot of variations inpractices between different forecasting centres. Thus theauthors have tried to be as generic as possible when describingaspects of numerical model design and formulation. Despitethe reliance on NWP, the human forecaster still has a big part toplay in producing weather forecasts and this is described, alongwith the issue of forecast verification – how forecastcentres measure their own performance and improve upon it. Advanced undergraduates and postgraduate students will use thisbook to understand how the theory comes together in the day-to-dayapplications of weather forecast production. In addition,professional weather forecasting practitioners, professional usersof weather forecasts and trainers will all find this new member ofthe RMetS Advancing Weather and Climate series avaluable tool. Provides an end-to-end description of the weather forecastingprocess Clearly structured and pitched at an accessible level, the bookdiscusses the practical choices that operational forecastingcentres have to make in terms of what numerical models they use andwhen they are run. Takes a very practical approach, using real life case-studiesto contextualize information Discusses the latest advances in the area, including ensemblemethods, monthly to seasonal range prediction and use of'nowcasting' tools such as radar and satelliteimagery Full colour throughout Written by a highly respected team of authors with experiencein both academia and practice. Part of the RMetS book series 'Advancing Weather andClimate'

Artificial Intelligence of Things for Weather Forecasting and Climatic Behavioral Analysis Gupta, Rajeev Kumar 2022-06-10 Weather forecasting and climate behavioral analysis have traditionally been done using complicated

physics models and accompanying atmospheric variables. However, the traditional approaches lack common tools, which can lead to incomplete information about the weather and climate conditions, in turn affecting the prediction accuracy rate. To address these problems, the advanced technological aspects through the spectrum of artificial intelligence of things (AIoT) models serve as a budding solution. Further study on artificial intelligence of things and how it can be utilized to improve weather forecasting and climatic behavioral analysis is crucial to appropriately employ the technology. Artificial Intelligence of Things for Weather Forecasting and Climatic Behavioral Analysis discusses practical applications of artificial intelligence of things for interpretation of weather patterns and how weather information can be used to make critical decisions about harvesting, aviation, etc. This book also considers artificial intelligence of things issues such as managing natural disasters that impact the lives of millions. Covering topics such as deep learning, remote sensing, and meteorological applications, this reference work is ideal for data scientists, industry professionals, researchers, academicians, scholars, practitioners, instructors, and students.

Proceedings of the Second International Conference on the Future of ASEAN (ICoFA) 2017 – Volume 2 Rizauddin Saian 2018-05-04 This book examines how business, the social sciences, science and technology will impact the future of ASEAN. Following the ASEAN VISION 2020, it analyses the issues faced by ASEAN countries, which are diverse, while also positioning ASEAN as a competitive entity through partnerships. On the 30th anniversary of ASEAN, all ASEAN leaders agreed to the establishment of the ASEAN VISION 2020, which delineates the formation of a peaceful, stable and dynamically developed region while maintaining a community of caring societies in Malaysia, Indonesia, Singapore, Brunei, Vietnam, Thailand, the Philippines, Myanmar, Laos and Cambodia. In keeping with this aspiration, Universiti Teknologi MARA Perlis took the initial steps to organise conferences and activities that highlight the role of the ASEAN region. The Second International Conference on the Future of ASEAN (ICoFA) 2017 was organised by the Office of Academic Affairs, Universiti Teknologi MARA Perlis, to promote more comprehensive integration among ASEAN members. This book, divided into two volumes, offers a useful guide for all those engaged in research on business, the social sciences, science and technology. It will also benefit researchers worldwide who want to gain more knowledge about ASEAN countries

Statistical Forecasting of Florida Monthly Rainfall Linden S. Wolf 2009 ABSTRACT: This study computes statistical forecasts of monthly and three-monthly rainfall for seven regions of Florida defined by the National Climatic Data Center. First, time-lagged auto- and cross-correlations are computed involving monthly regional rainfall time series and various potential predictors. Various statistical monthly forecasting models are then built for each of the seven regions based on teleconnection indices and principal components of monthly heights of the global 500 hPa pressure surface. To compare these forecasts to those of the Climate Prediction Center (CPC), the forecasts are categorized into terciles, corresponding to the upper, middle,

and lower thirds of the climatological distribution of rainfall for each of the twelve months for each region. Following CPC, these are scored with the Heidke Skill Score. The variability of model coefficients and forecast skill is measured using cross-validation.

<u>2021 6th International Conference on Inventive Computation Technologies (ICICT)</u>
IEEE Staff 2021-01-20 From past decades, Computational Intelligence CI encompasses a wide range of computational methodologies, which mainly includes neural networks, Fuzzy Systems, Genetic algorithms and other such hybrid computing models to address various real world complexities and uncertainties Recently, the emerging intelligent computing technologies focus primarily on solving the data analysis challenges in various real time applications like industries, financial and business models, scientific and social networking applications The International Conference on Inventive Computation technologies ICICT 2021 organized by RVS Technical Campus on 20 22 January, 2021 attempts to create a collaborative research platform to foster innovative research insights in the design, development, and applications of intelligent computing technologies

Applied Time Series and Box-Jenkins Models Walter Vandaele 1983 This book can be used in an advanced undergraduate course or beginning graduate course on time series forecasting. Such a course could be part of a business school, department of economics, or engineering curriculum. Social science departments (education, psychology, public health, medicine) have also started to introduce such a course in their curriculum and researchers in these fields are using the time series methodology covered in this book in their applied work.

Hydrological Forecasting with Radar and the Probability Distributed Hydrological Model (PDM) Gbotemi Abraham Adediran 2015-07-01 The efficiency of a probabilistic hydrological forecasting system with weather radar and the Probability distributed hydrological model (PDM) was evaluated at the Brue catchment; south-western England. The ability of the radar to measure gauged precipitation in 2007 (regarded as the ground truth) was evaluated using Normalized Bias (NB) and Normalized Error (NE) statistics as the objective function of evaluation. The radar overestimated precipitation measurements by average gauges with NB value of 0.41 and a considerably low NE of 0.68. Furthermore, the effectiveness of a Deterministic nowcasting system (DNS) to forecast radar measured precipitation at 132 forecast time series of 6hrs forecast lead time was assessed. The DNS overestimated the radar measured precipitation with a NB value of 87% and recorded an accumulated NE of 146%. Moreover, the efficiencies of 10 ensemble precipitation forecats generated from a Stochastic nowcasting system (SNS) over the singular deterministic forecasts from the DNS was evaluated at 3 major hydrological events. Some of the ensembles significantly performed better than the deterministic forecast and brilliantly captured the radar measured precipitation at most of the forecast time series. Furthermore, the efficiencies of these sources of precipitation measurement to simulate flows with the PDM at the Brue catchment were also assessed by integrating the radar-based forecasts with measurements from

average gauges. The PDM performed satisfactorily well in simulating the flows of 17th January 2007 with an average Nash–Sutcliffe Efficiency Index (NSE) of 0.65 and the model was judged insensitive to the significantly high precipitation inputs for the hydrological event of 27th of May 2007. However, the PDM performed poorly in simulating flows for the historical storms of 20th of July 2007; with the model under estimating flows with bias value of over 250 cumecs for an event popular for its devastating flooding in the Southwest of England. The model inadequacies was however associated to poor radar precipitation measurements and forecasts on which flow simulation was based. This work therefore emphasis the need for developments in hydrological modeling as well as advancement in weather radar technology to effectively correct radar errors due to radar calibration, signal attenuation, clutter and anomalous propagation, vertical variation of reflectivity, range effects, Z-R relationships, variations of drop size distributions, vertical air motions, beam overshooting the shallow precipitation and sampling issues, that has been identified to affect radar measurements.

Smart Computing Techniques and Applications Suresh Chandra Satapathy 2021-07-07 This book presents best selected papers presented at the 4th International Conference on Smart Computing and Informatics (SCI 2020), held at the Department of Computer Science and Engineering, Vasavi College of Engineering (Autonomous), Hyderabad, Telangana, India. It presents advanced and multi-disciplinary research towards the design of smart computing and informatics. The theme is on a broader front which focuses on various innovation paradigms in system knowledge, intelligence and sustainability that may be applied to provide realistic solutions to varied problems in society, environment and industries. The scope is also extended towards the deployment of emerging computational and knowledge transfer approaches, optimizing solutions in various disciplines of science, technology and health care.

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.

Advanced Soft Computing Techniques in Data Science, IoT and Cloud Computing Sujata Dash

Time Series Modelling of Water Resources and Environmental Systems K.W. Hipel 1994-04-07 This is a comprehensive presentation of the theory and practice of time series modelling of environmental systems. A variety of time series models are explained and illustrated, including ARMA (autoregressive-moving average), nonstationary, long memory, three families of seasonal, multiple input-single output, intervention and multivariate ARMA models. Other topics in environmetrics covered in this book include time series analysis in decision

making, estimating missing observations, simulation, the Hurst phenomenon, forecasting experiments and causality. Professionals working in fields overlapping with environmetrics - such as water resources engineers, environmental scientists, hydrologists, geophysicists, geographers, earth scientists and planners - will find this book a valuable resource. Equally, environmetrics, systems scientists, economists, mechanical engineers, chemical engineers, and management scientists will find the time series methods presented in this book useful.

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 fi rst model with only a few lines of code. You'll then cover advanced features such as visualizing your forecasts, adding holidays, seasonality, and trend changepoints, 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.

Applications of Seasonal Climate Forecasting in Agricultural and Natural Ecosystems Graeme L. Hammer 2013-03-09 Climate variability has major impacts in many parts of the world, including Australia. Developments in understanding of

the El Niño - Southern Oscillation Phenomenon have introduced some skill in seasonal to inter-annual climate forecasting. Can this skill be harnessed to advantage? Or do we just continue to observe these impacts? How does a decision-maker managing an agricultural or natural ecosystem modify decisions in response to a skillful, but imprecise, seasonal climate forecast? Using Australian experience as a basis, this book focuses on these questions in pursuing means to better manage climate risks. The state of the science in climate forecasting is reviewed before considering detailed examples of applications to: farm scale agricultural decisions (such as management of cropping and grazing systems); regional and national scale agricultural decisions (such as commodity trading and government policy); and natural systems (such as water resources, pests and diseases, and natural fauna). Many of the examples highlight the participatory and inter-disciplinary approach required among decision-makers, resource systems scientists/analysts, and climate scientists to bring about the effective applications. The experiences discussed provide valuable insights beyond the geographical and disciplinary focus of this book. The book is ideally suited to professionals and postgraduate students in ecology, agricultural climatology, environmental planning, and climate science.

River Basin Modelling for Flood Risk Mitigation Donald Knight 2005-11-17 Flooding accounts for one-third of natural disasters worldwide and for over half the deaths which occur as a result of natural disasters. As the frequency and volume of flooding increases, as a result of climate change, there is a new urgency amongst researchers and professionals working in flood risk management. River Basin Modelling for Flood Risk Mitigation brings together thirty edited papers by leading experts who gathered for the European Union's Advanced Study Course at the University of Birmingham, UK. The scope of the course ranged from issues concerning the protection of life, to river restoration and wetland management. A variety of topics is covered in the book including climate change, hydro-informatics, hydro-meterology, river flow forecasting systems and dam-break modelling. The approach is broad, but integrated, providing an attractive and informative package that will satisfy researchers and professionals, while offering a sound introduction to students in Engineering and Geography.

Intermittent Demand Forecasting John E. Boylan 2021-06-02 INTERMITTENT DEMAND FORECASTING The first text to focus on the methods and approaches of intermittent, rather than fast, demand forecasting Intermittent Demand Forecasting is for anyone who is interested in improving forecasts of intermittent demand products, and enhancing the management of inventories. Whether you are a practitioner, at the sharp end of demand planning, a software designer, a student, an academic teaching operational research or operations management courses, or a researcher in this field, we hope that the book will inspire you to rethink demand forecasting. If you do so, then you can contribute towards significant economic and environmental benefits. No prior knowledge of intermittent demand forecasting or inventory management is assumed in this book. The key formulae are accompanied by worked examples to show how

they can be implemented in practice. For those wishing to understand the theory in more depth, technical notes are provided at the end of each chapter, as well as an extensive and up-to-date collection of references for further study. Software developments are reviewed, to give an appreciation of the current state of the art in commercial and open source software. "Intermittent demand forecasting may seem like a specialized area but actually is at the center of sustainability efforts to consume less and to waste less. Boylan and Syntetos have done a superb job in showing how improvements in inventory management are pivotal in achieving this. Their book covers both the theory and practice of intermittent demand forecasting and my prediction is that it will fast become the bible of the field." —Spyros Makridakis, Professor, University of Nicosia, and Director, Institute for the Future and the Makridakis Open Forecasting Center (MOFC). "We have been able to support our clients by adopting many of the ideas discussed in this excellent book, and implementing them in our software. I am sure that these ideas will be equally helpful for other supply chain software vendors and for companies wanting to update and upgrade their capabilities in forecasting and inventory management." —Suresh Acharya, VP, Research and Development, Blue Yonder. "As product variants proliferate and the pace of business quickens, more and more items have intermittent demand. Boylan and Syntetos have long been leaders in extending forecasting and inventory methods to accommodate this new reality. Their book gathers and clarifies decades of research in this area, and explains how practitioners can exploit this knowledge to make their operations more efficient and effective." —Thomas R. Willemain, Professor Emeritus, Rensselaer Polytechnic Institute.

Ubiquitous Intelligent Systems P. Karuppusamy

Stochasticity, Nonlinearity and Forecasting of Streamflow Processes Wen Wang 2006 "Streamflow forecasting is of great importance to water resources management and flood defense. On the other hand, a better understanding of the streamflow process is fundamental for improving the skill of streamflow forecasting. The methods for forecasting streamflows may fall into two general classes: process-driven methods and data-driven methods. Equivalently, methods for understanding streamflow processes may also be broken into two categories: physically-based methods and mathematically-based methods. This publication focuses on using mathematically-based methods to analyze stochasticity and nonlinearity of streamflow processes based on univariate historic streamflow records, and presents data-driven models that are also mainly based on univariate streamflow time series. Six streamflow processes of five rivers in different geological regions are investigated for stochasticity and nonlinearity at several characteristic timescales (i.e., one day, one month, 1/3 month and one year). But only the streamflows of the upper Yellow River in northern China are considered for forecasting."

Artificial Intelligence and Security Xingming Sun 2019-07-18 The 4-volume set LNCS 11632 until LNCS 11635 constitutes the refereed proceedings of the 5th International Conference on Artificial Intelligence and Security, ICAIS 2019, which was held in New York, USA, in July 2019. The conference was formerly

called "International Conference on Cloud Computing and Security" with the acronym ICCCS. The total of 230 full papers presented in this 4-volume proceedings was carefully reviewed and selected from 1529 submissions. The papers were organized in topical sections as follows: Part I: cloud computing; Part II: artificial intelligence; big data; and cloud computing and security; Part III: cloud computing and security; information hiding; IoT security; multimedia forensics; and encryption and cybersecurity; Part IV: encryption and cybersecurity.

Climate and Land Degradation Mannava VK Sivakumar 2007-10-11 Based on an International Workshop held in Arusha, Tanzania, this book presents state-of-the-art papers, real world applications, and innovative techniques for combating land degradation. It offers recommendations for effectively using weather and climate information for sustainable land management practices.

Forecasting, Structural Time Series Models and the Kalman Filter Andrew C. Harvey 1990-02-22 In this book, Andrew Harvey sets out to provide a unified and comprehensive theory of structural time series models. Unlike the traditional ARIMA models, structural time series models consist explicitly of unobserved components, such as trends and seasonals, which have a direct interpretation. As a result the model selection methodology associated with structural models is much closer to econometric methodology. The link with econometrics is made even closer by the natural way in which the models can be extended to include explanatory variables and to cope with multivariate time series. From the technical point of view, state space models and the Kalman filter play a key role in the statistical treatment of structural time series models. The book includes a detailed treatment of the Kalman filter. This technique was originally developed in control engineering, but is becoming increasingly important in fields such as economics and operations research. This book is concerned primarily with modelling economic and social time series, and with addressing the special problems which the treatment of such series poses. The properties of the models and the methodological techniques used to select them are illustrated with various applications. These range from the modellling of trends and cycles in US macroeconomic time series to to an evaluation of the effects of seat belt legislation in the UK.

Intelligent Systems, Technologies and Applications Marcin Paprzycki 2021-05-31 This book offers to readers a selection of refereed papers that were presented at the Sixth International Symposium on Intelligent Systems Technologies and Applications (ISTA'20). All submissions were evaluated on the basis of their significance, novelty, and technical quality. This book consists of 28 papers (19 regular and 9 short papers) that were virtually presented at the Symposium. The papers cover different areas such as big data analytics, security and privacy, Internet of things, machine and deep learning, health informatics, visual computing, signal processing, and natural language processing. The book is directed to the researchers and scientists engaged in various fields of intelligent systems.

Advances in Computing and Data Sciences Mayank Singh 2020-07-17 This book constitutes the post-conference proceedings of the 4th International Conference on Advances in Computing and Data Sciences, ICACDS 2020, held in Valletta, Malta, in April 2020.* The 46 full papers were carefully reviewed and selected from 354 submissions. The papers are centered around topics like advanced computing, data sciences, distributed systems organizing principles, development frameworks and environments, software verification and validation, computational complexity and cryptography, machine learning theory, database theory, probabilistic representations. * The conference was held virtually due to the COVID-19 pandemic.

Remote Sensing Applications in Dryland Natural Resource Management Dr. Mahesh Gaur 2013-01-01 Arid and semi-arid areas are now facing a threefold holistic crisis: economic, food, and climate. What has emerged from these crises is the vital importance of inter-linkages among them on the one hand, and the missed opportunities in putting these pieces together on the other. This book has tried to explore these challenges though in-depth discussions of the individual. It is anticipated to inspire a forward looking debate that looks at the lessons from the past and points to actions for the future. Expertise views have been shared scientists and persons of eminence on the national and state level challenges with futuristic remedial approaches.

Beyond Traditional Probabilistic Methods in Economics Vladik Kreinovich 2018-11-24 This book presents recent research on probabilistic methods in economics, from machine learning to statistical analysis. Economics is a very important – and at the same a very difficult discipline. It is not easy to predict how an economy will evolve or to identify the measures needed to make an economy prosper. One of the main reasons for this is the high level of uncertainty: different difficult-to-predict events can influence the future economic behavior. To make good predictions and reasonable recommendations, this uncertainty has to be taken into account. In the past, most related research results were based on using traditional techniques from probability and statistics, such as p-value-based hypothesis testing. These techniques led to numerous successful applications, but in the last decades, several examples have emerged showing that these techniques often lead to unreliable and inaccurate predictions. It is therefore necessary to come up with new techniques for processing the corresponding uncertainty that go beyond the traditional probabilistic techniques. This book focuses on such techniques, their economic applications and the remaining challenges, presenting both related theoretical developments and their practical applications.

Intelligent Computing Methodologies De-Shuang Huang 2020-10-15 This two-volume set of LNCS 12463 and LNCS 12464 constitutes - in conjunction with the volume LNAI 12465 - the refereed proceedings of the 16th International Conference on Intelligent Computing, ICIC 2020, held in Bari, Italy, in October 2020. The 162 full papers of the three proceedings volumes were carefully reviewed and selected from 457 submissions. The ICIC theme unifies the picture of contemporary intelligent computing techniques as an integral concept that

highlights the trends in advanced computational intelligence and bridges theoretical research with applications. The theme for this conference is "Advanced Intelligent Computing Methodologies and Applications." Papers related to this theme are especially solicited, addressing theories, methodologies, and applications in science and technology.

Information Systems Design and Intelligent Applications J. K. Mandal 2015-01-20 The second international conference on INformation Systems Design and Intelligent Applications (INDIA – 2015) held in Kalyani, India during January 8-9, 2015. The book covers all aspects of information system design, computer science and technology, general sciences, and educational research. Upon a double blind review process, a number of high quality papers are selected and collected in the book, which is composed of two different volumes, and covers a variety of topics, including natural language processing, artificial intelligence, security and privacy, communications, wireless and sensor networks, microelectronics, circuit and systems, machine learning, soft computing, mobile computing and applications, cloud computing, software engineering, graphics and image processing, rural engineering, e-commerce, e-governance, business computing, molecular computing, nano-computing, chemical computing, intelligent computing for GIS and remote sensing, bio-informatics and bio-computing. These fields are not only limited to computer researchers but also include mathematics, chemistry, biology, bio-chemistry, engineering, statistics, and all others in which computer techniques may assist.

Stochastic Hydrology and its Use in Water Resources Systems Simulation and Optimization J.B. Marco 2012-12-06 Stochastic hydrology is an essential base of water resources systems analysis, due to the inherent randomness of the input, and consequently of the results. These results have to be incorporated in a decision-making process regarding the planning and management of water systems. It is through this application that stochastic hydrology finds its true meaning, otherwise it becomes merely an academic exercise. A set of well known specialists from both stochastic hydrology and water resources systems present a synthesis of the actual knowledge currently used in real-world planning and management. The book is intended for both practitioners and researchers who are willing to apply advanced approaches for incorporating hydrological randomness and uncertainty into the simulation and optimization of water resources systems. (abstract) Stochastic hydrology is a basic tool for water resources systems analysis, due to inherent randomness of the hydrologic cycle. This book contains actual techniques in use for water resources planning and management, incorporating randomness into the decision making process. Optimization and simulation, the classical systems-analysis technologies, are revisited under up-to-date statistical hydrology findings backed by real world applications.

Introductory Time Series with R Paul S.P. Cowpertwait 2009-05-28 This book gives you a step-by-step introduction to analysing time series using the open source software R. Each time series model is motivated with practical applications, and is defined in mathematical notation. Once the model has been introduced it is used to generate synthetic data, using R code, and these

generated data are then used to estimate its parameters. This sequence enhances understanding of both the time series model and the R function used to fit the model to data. Finally, the model is used to analyse observed data taken from a practical application. By using R, the whole procedure can be reproduced by the reader. All the data sets used in the book are available on the website http://staff.elena.aut.ac.nz/Paul-Cowpertwait/ts/. The book is written for undergraduate students of mathematics, economics, business and finance, geography, engineering and related disciplines, and postgraduate students who may need to analyse time series as part of their taught programme or their research.

Internet of Things and Machine Learning in Agriculture Jyotir Moy Chatterjee 2021-02-08 Agriculture is one of the most fundamental human activities. As the farming capacity has expanded, the usage of resources such as land, fertilizer, and water has grown exponentially, and environmental pressures from modern farming techniques have stressed natural landscapes. Still, by some estimates, worldwide food production needs to increase to keep up with global food demand. Machine Learning and the Internet of Things can play a promising role in the Agricultural industry, and help to increase food production while respecting the environment. This book explains how these technologies can be applied, offering many case studies developed in the research world.

Hydrometeorology Christopher G. Collier 2016-07-22 Hydrometeorology presents an introduction to relevant topics in the interdisciplinary fields of hydrology and meteorology. This book is one of the few books aiming to provide a balance between aspects of meteorological and hydrological processes. The transfer of energy and water between the land surface and lower atmosphere within the hydrological cycle is addressed followed by a description of the nature of precipitation, and how it is formed. Forecasting precipitation is reviewed on all scales, and the range of rainfall-runoff models and coastal surge models and forecasts (including tsunamis) which have been, and are being, used are discussed. The mechanisms of snow, ice (glacier, sea and tundra), evaporation and transpiration, how drought occurs and the representation of wind are described. How rainfall (including radar measurements) and river flow information is gathered and analysed (including, frequency analysis, Probable Maximum Precipitation and Flood) are presented. Satellite measurements of precipitation are discussed. Examples of major past floods and droughts are given. Past and future climate change, which is included, underpins the importance of hydro-meteorological processes. The structure of the general circulation of the atmosphere and how it influences weather and climate including the Hadley, Ferrel and Polar cells, the Trade winds and the El Nino, is outlined. Finally, the influence of urban areas on rainfall formation, dealing with urban drainage and air quality are described. Each chapter ends with one or two specific points as appendices, elements discussed in the chapter and a list of sample problems to aid understanding. Readership: This book is aimed at 3rd year undergraduate and postgraduate students on hydrology/hydrometeorology, environmental science and geography courses. Professionals in environmental protection agencies and consultancies will also

find the book of great interest. It contains a balance of both the physics and mathematics which underpin such courses and activities.

Time-Series Modeling of Rainfall Density Information Richard J. D'Accardi 1978 In the literature there are basically two approaches to the prediction of climatological occurrence (rainfall) statistics: (a) One can use large numbers of observations of climatological phenomena to compile statistics on the probability of occurrence. (b) One can use computational models and available climatological data (past history) to calculate occurrence statistics. Recent modeling attempts start with very small point rainfall distribution functions which are transformed into specific attenuation data. The point rainfall rates are based upon a large history of data which does not indicate the spatial variation of rain. There are, however, indications that outage time on line-of-sight communication links can be estimated from distributions of point rainfall rates. Due to the random nature of rainfall, and due to the time dependence of such information, a logical approach to forecasting this phenomenon and interpreting the results with respect to systems performance seems to lie within the realm of non-stationary time-series modeling. This report presents an attempt to develop statistical models which can be used to forecast in near-real-time and to characterize the underlying stochastic processes of short-term rainfall density information. It should be mentioned that the analysis and modeling are directed towards the accurate characterization of precipitation density and not the probability of precipitation occurrence. Due to the wavelengths involved in Line-of-Sight Communication links, i.e., 5-30 GHz, the size of raindrops have a definite dispersive and absorptive effect on propagated electromagnetic energy. The importance, therefore, of this work is self-evident.

Recent Trends in Image Processing and Pattern Recognition K. C. Santosh 2019-07-16 This three-book set constitutes the refereed proceedings of the Second International Conference on Recent Trends in Image Processing and Pattern Recognition (RTIP2R) 2018, held in Solapur, India, in December 2018. The 173 revised full papers presented were carefully reviewed and selected from 374 submissions. The papers are organized in topical sections in the tree volumes. Part I: computer vision and pattern recognition; machine learning and applications; and image processing. Part II: healthcare and medical imaging; biometrics and applications. Part III: document image analysis; image analysis in agriculture; and data mining, information retrieval and applications.

Advances in Streamflow Forecasting Priyanka Sharma 2021-06-20 Advances in Streamflow Forecasting: From Traditional to Modern Approaches covers the three major data-driven approaches of streamflow forecasting including traditional approach of statistical and stochastic time-series modelling with their recent developments, stand-alone data-driven approach such as artificial intelligence techniques, and modern hybridized approach where data-driven models are combined with preprocessing methods to improve the forecast accuracy of streamflows and to reduce the forecast uncertainties. This book starts by providing the background information, overview, and advances made in streamflow

forecasting. The overview portrays the progress made in the field of streamflow forecasting over the decades. Thereafter, chapters describe theoretical methodology of the different data-driven tools and techniques used for streamflow forecasting along with case studies from different parts of the world. Each chapter provides a flowchart explaining step-by-step methodology followed in applying the data-driven approach in streamflow forecasting. This book addresses challenges in forecasting streamflows by abridging the gaps between theory and practice through amalgamation of theoretical descriptions of the data-driven techniques and systematic demonstration of procedures used in applying the techniques. Language of this book is kept simple to make the readers understand easily about different techniques and make them capable enough to straightforward replicate the approach in other areas of their interest. This book will be vital for hydrologists when optimizing the water resources system, and to mitigate the impact of destructive natural disasters such as floods and droughts by implementing long-term planning (structural and nonstructural measures), and short-term emergency warning. Moreover, this book will guide the readers in choosing an appropriate technique for streamflow forecasting depending upon the given set of conditions. Contributions from renowned researchers/experts of the subject from all over the world to provide the most authoritative outlook on streamflow forecasting Provides an excellent overview and advances made in streamflow forecasting over the past more than five decades and covers both traditional and modern data-driven approaches in streamflow forecasting Includes case studies along with detailed flowcharts demonstrating a systematic application of different data-driven models in streamflow forecasting, which helps understand the step-by-step procedures