# Time Seris Model Using For Forecast Rainfall

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*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.
Soft Computing: Theories and Applications - Millie Pant 2020-06-29
This book focuses on soft computing and how it can be applied to solve real-world problems arising in various domains, ranging from medicine and healthcare, to supply chain management, image processing and cryptanalysis. It gathers high-quality papers presented at the International Conference on Soft Computing: Theories and Applications (SoCTA 2019), organized by the National Institute of Technology Patna, India. Offering valuable insights into soft computing for teachers and researchers alike, the book will inspire further research in this dynamic field.
*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.
**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.
*Twenty-Seventh International Congress on Large Dams Vingt-Septième Congrès International des Grands Barrages* - ICOLD CIGB 2022-05-20
The International Committee on Large Dams (ICOLD) held its 27th International Congress in Marseille, France (12-19 November 2021). The proceedings of the congress focus on four main questions: 1. Reservoir sedimentation and sustainable development; 2. Safety and risk analysis; 3. Geology and dams, and 4. Small dams and levees. The book thoroughly discusses these questions and is indispensable for academics, engineers and professionals involved or interested in engineering, hydraulic engineering and related disciplines.
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.
**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.
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.
*Ubiquitous Intelligent Systems* - P. Karuppusamy 2021-10-08
This book features a collection of high-quality, peer-reviewed papers presented at International Conference on Ubiquitous Intelligent Systems (ICUIS 2021) organized by Shree Venkateshwara Hi-Tech Engineering College, Tamil Nadu, India, during April 16–17, 2021. The book covers topics such as cloud computing, mobile computing and networks, embedded computing frameworks, modeling and analysis of ubiquitous information systems, communication networking models, big data models and applications, ubiquitous information processing systems, next-generation ubiquitous networks and protocols, advanced intelligent systems, Internet of things, wireless communication and storage networks, intelligent information retrieval techniques, AI-based intelligent information visualization techniques, cognitive informatics, smart automation systems, healthcare informatics and bioinformatics models, security and privacy of intelligent information systems, and smart distributed information 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.
Proceedings of the Thirteenth Annual Climate Diagnostics Workshop - 1989

**Intelligent Information and Database Systems** - Jeng-Shyang Pan 2012-03-02
The three-volume set LNAI 7196, LNAI 7197 and LNAI 7198 constitutes the refereed proceedings of the 4th Asian Conference on Intelligent Information and Database Systems, ACIIDS 2012, held in Kaohsiung, Taiwan in March 2012. The 161 revised papers presented were carefully reviewed and selected from more than 472 submissions. The papers included cover the following topics: intelligent database systems, data warehouses and data mining, natural language processing and computational linguistics, semantic Web, social networks and recommendation systems, collaborative systems and applications, e-bussiness and e-commerce systems, e-learning systems, information modeling and requirements engineering, information retrieval systems, intelligent agents and multi-agent systems, intelligent information systems, intelligent internet systems, intelligent optimization techniques, object-relational DBMS, ontologies and knowledge sharing, semi-structured and XML database systems, unified modeling language and unified processes, Web services and semantic Web, computer networks and communication systems.
**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.
**Visualization Techniques for Climate Change with Machine Learning and Artificial Intelligence** - Arun Lal Srivastav 2022-11-18
Visualization Techniques for Climate Change with Machine Learning and Artificial Intelligence covers computer-aided artificial intelligence and machine learning technologies as related to the impacts of climate change and its potential to prevent/remediate the effects. As such, different types of algorithms, mathematical relations and software models may help us to understand our current reality, predict future weather events and create new products and services to minimize human impact, chances of improving and saving lives and creating a healthier world. This book covers different types of tools for the prediction of climate change and alternative systems which can reduce the levels of threats observed by climate change scientists. Moreover, the book will help to achieve at least one of 17 sustainable development goals i.e., climate action. Includes case studies on the application of AI and machine learning for monitoring climate change effects and management Features applications of software and algorithms for modeling and forecasting climate change Shows how real-time monitoring of specific factors (temperature, level of greenhouse gases, rain fall patterns, etc.) are responsible for climate change and possible mitigation efforts to achieve environmental sustainability
*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.
**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’

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.

**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

*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.

**Soft Computing Applications and Intelligent Systems** - Shahrul Azman Noah 2013-08-16

This book constitutes the refereed proceedings of the International Second International Multi-Conference on Artificial Intelligence Technology, M-CAIT 2013, held in Shah Alam, in August 2013. The 25 revised full papers presented were carefully reviewed and selected from 110 submissions. M-CAIT 2013 hosted four special tracks in a single event: Intelligence Computation on Pattern Analysis and Robotics (ICPAIR 2013), Data Mining and Optimization (DMO 2013), Semantic Technology and Information Retrieval (STAIR 2013) and Industrial Computing & Applied Informatics (IComp 2013). The papers address issues of state-of-the-art research, development, implementation and applications within the four focus areas in CAIT: pattern recognition, data mining and optimization, knowledge technology and industrial computing.

**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."

**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.

**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.

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.

**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.

**Selected Water Resources Abstracts** - 1991

**Advanced Soft Computing Techniques in Data Science, IoT and Cloud Computing** - Sujata Dash 2021-11-05

This book plays a significant role in improvising human life to a great extent. The new applications of soft computing can be regarded as an emerging field in computer science, automatic control engineering, medicine, biology application, natural environmental engineering, and pattern recognition. Now, the exemplar model for soft computing is human brain. The use of various techniques of soft computing is nowadays successfully implemented in many domestic, commercial, and industrial applications due to the low-cost and very high-performance digital processors and also the decline price of the memory chips. This is the main reason behind the wider expansion of soft computing techniques and its application areas. These computing methods also play a significant role in the design and optimization in diverse engineering disciplines. With the influence and the development of the Internet of things (IoT) concept, the need for using soft computing techniques has become more significant than ever. In general, soft computing methods are closely similar to biological processes than traditional techniques, which are mostly based on formal logical systems, such as sentential logic and predicate logic, or rely heavily on computer-aided numerical analysis. Soft computing techniques are anticipated to complement each other. The aim of these techniques is to accept imprecision, uncertainties, and approximations to get a rapid solution. However, recent advancements in representation soft computing algorithms (fuzzy logic,evolutionary computation, machine learning, and probabilistic reasoning) generate a more intelligent and robust system providing a human interpretable, low-cost, approximate solution. Soft computing-based algorithms have demonstrated great performance to a variety of areas including multimedia retrieval, fault tolerance, system modelling, network architecture, Web semantics, big data analytics, time series, biomedical and health informatics, etc. Soft computing approaches such as genetic programming (GP), support vector machine–firefly algorithm (SVM-FFA), artificial neural network (ANN), and support vector machine–wavelet (SVM–Wavelet) have emerged as powerful computational models. These have also shown significant success in dealing with massive data analysis for large number of applications. All the researchers and practitioners will be highly benefited those who are working in field of computer engineering, medicine, biology application, signal processing, and mechanical engineering. This book is a good collection of state-of-the-art approaches for soft computing-based applications to various engineering fields. It is very beneficial for the new researchers and practitioners working in the field to quickly know the best performing methods. They would be able to compare different approaches and can carry forward their research in the most important area of research which has direct impact on betterment of the human life and health. This book is very useful because there is no book in the market which provides a good collection of state-of-the-art methods of soft computing-based models for multimedia retrieval, fault tolerance, system modelling, network architecture, Web semantics, big data analytics, time series, and biomedical and health informatics.

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

This is the proceedings of the Third Workshop on Computing: Theory and Practice, WCTP 2014 devoted to theoretical and practical approaches to computation. This workshop was organized by four top universities in Japan and the Philippines: Tokyo Institute of Technology, Osaka University, University of the Philippines - Diliman, and De La Salle University. The proceedings provides a view of the current movement in research in these two countries. The papers included in the proceedings focus on the two research areas: theoretical and practical aspects of computation.

*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.

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.

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.

*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.

**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.

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.

**Flood Risk Management** - Theodore V Hromadka II 2017-08-30

In this book, contributions from several experts specializing in the area of flood risk management are assembled into a single volume. Application and testing of numerical and statistical models that can simulate the complex reality along with effective flood management strategies that are being implemented in various nations are presented. This collection of topics will provide an update to the reader as to the state of the art in this important technical field.

**Use of Meta-Heuristic Techniques in Rainfall-Runoff Modelling** - Kwok-wing Chau 2018-07-10

This book is a printed edition of the Special Issue "Use of Meta-Heuristic Techniques in Rainfall-Runoff Modelling" that was published in Water

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

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.

**Computational Intelligence in the Internet of Things** - Purnomo, Hindriyanto Dwi 2019-03-15

In recent years, the need for smart equipment has increased exponentially with the upsurge in technological advances. To work to their fullest capacity, these devices need to be able to communicate with other devices in their network to exchange information and receive instructions. Computational Intelligence in the Internet of Things is an essential reference source that provides relevant theoretical frameworks and the latest empirical research findings in the area of computational intelligence and the Internet of Things. Featuring research on topics such as data analytics, machine learning, and neural networks, this book is ideally designed for IT specialists, managers, professionals, researchers, and academicians.

**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.