

Survey On Spatio Temporal Clustering

The Definitive Volume on Cutting-Edge Exploratory Analysis of Massive Spatial and Spatiotemporal Databases Since the publication of the first edition of *Geographic Data Mining and Knowledge Discovery*, new techniques for geographic data warehousing (GDW), spatial data mining, and geovisualization (GVis) have been developed. In addition, there has been a comprehensive text on foundations and techniques of graph neural networks with applications in NLP, data mining, vision and healthcare.

The six-volume set LNCS 12742, 12743, 12744, 12745, 12746, and 12747 constitutes the proceedings of the 21st International Conference on Computational Science, ICCS 2021, held in Krakow, Poland, in June 2021.* The total of 260 full papers and 57 short papers presented in this book set were carefully reviewed and selected from 635 submissions. 48 full and 14 short papers were accepted to the main track from 156 submissions; 212 full and 43 short papers were accepted to the workshops/ thematic tracks from 479 submissions. The papers were organized in topical sections named: Part I: ICCS Main Track Part II: Advances in High-Performance Computational Earth Sciences: Applications and Frameworks; Applications of Computational Methods in Artificial Intelligence and Machine Learning; Artificial Intelligence and High-Performance Computing for Advanced Simulations; Biomedical and Bioinformatics Challenges for Computer Science Part III: Classifier Learning from Difficult Data; Computational Analysis of Complex Social Systems; Computational Collective Intelligence; Computational Health Part IV: Computational Methods for Emerging Problems in (dis-)Information Analysis; Computational Methods in Smart Agriculture; Computational Optimization, Modelling and Simulation; Computational Science in IoT and Smart Systems Part V: Computer Graphics, Image Processing and Artificial Intelligence; Data-Driven Computational Sciences; Machine Learning and Data Assimilation for Dynamical Systems; MeshFree Methods and Radial Basis Functions in Computational Sciences; Multiscale Modelling and Simulation Part VI: Quantum Computing Workshop; Simulations of Flow and Transport: Modeling, Algorithms and Computation; Smart Systems: Bringing Together Computer Vision, Sensor Networks and Machine Learning; Software Engineering for Computational Science; Solving Problems with Uncertainty; Teaching Computational Science; Uncertainty Quantification for Computational Models *The conference was held virtually. Chapter "Deep Learning Driven Self-adaptive hp Finite Element Method" is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

Winner of the 2013 DeGroot Prize. A state-of-the-art presentation of spatio-temporal processes, bridging classic ideas with modern hierarchical statistical modeling concepts and the latest computational methods Noel Cressie and Christopher K. Wikle, are also winners of the 2011 PROSE Award in the Mathematics category, for the book "Statistics for Spatio-Temporal Data" (2011), published by John Wiley and Sons. (The PROSE awards, for Professional and Scholarly Excellence, are given by the Association of American Publishers, the national trade association of the US book publishing industry.) *Statistics for Spatio-Temporal Data* has now been reprinted with small corrections to the text and the bibliography. The overall content and pagination of the new printing remains the same; the difference comes in the form of corrections to typographical errors, editing of incomplete and missing references, and some updated spatio-temporal interpretations. From understanding environmental processes and climate trends to developing new technologies for mapping public-health data and the spread of invasive-species, there is a high demand for statistical analyses of data that take spatial, temporal, and spatio-temporal information into account. *Statistics for Spatio-Temporal Data* presents a systematic approach to key quantitative techniques that incorporate the latest advances in statistical computing as well as hierarchical, particularly Bayesian, statistical modeling, with an emphasis on dynamical spatio-temporal models. Cressie and Wikle supply a unique presentation that incorporates ideas from the areas of time series and spatial statistics as well as stochastic processes. Beginning with separate treatments of temporal data and spatial data, the book combines these concepts to discuss spatio-temporal statistical methods for understanding complex processes. Topics of coverage include: Exploratory methods for spatio-temporal data, including visualization, spectral analysis, empirical orthogonal function analysis, and LISAs Spatio-temporal covariance functions, spatio-temporal kriging, and time series of spatial processes Development of hierarchical dynamical spatio-temporal models (DSTMs), with discussion of linear and nonlinear DSTMs and computational algorithms for their implementation Quantifying and exploring spatio-temporal variability in scientific applications, including case studies based on real-world environmental data Throughout the book, interesting applications demonstrate the relevance of the presented concepts. Vivid, full-color graphics emphasize the visual nature of the topic, and a related FTP site contains supplementary material. *Statistics for Spatio-Temporal Data* is an excellent book for a graduate-level course on spatio-temporal statistics. It is also a valuable reference for researchers and practitioners in the fields of applied mathematics, engineering, and the environmental and health sciences.

Covariance Functions and Directional Properties

Comprehensive Geographic Information Systems

Web and Wireless Geographical Information Systems

Spatio-Temporal Data Streams

Bifurcation Theory and Spatio-temporal Pattern Formation

Confederated International Conferences, CoopIS, DOA, IS, and ODBASE 2009, Vilamoura, Portugal, November 1-6, 2009, Proceedings

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

This book is an updated version of a well-received book previously published in Chinese by Science Press of China (the first edition in 2006 and the second in 2013). It offers a systematic and practical overview of spatial data mining, which combines computer science and geospatial information science, allowing each field to profit from the knowledge and techniques of the other. To address the spatiotemporal specialties of spatial data, the authors introduce the key concepts and algorithms of the data field, cloud model, mining view, and Deren Li methods. The data field method captures the interactions between spatial objects by diffusing the data contribution from a universe of samples to a universe of population, thereby bridging the gap between the data model and the recognition model. The cloud model is a qualitative method that utilizes quantitative numerical characters to bridge the gap between pure data and linguistic concepts. The mining view method discriminates the different requirements by using scale, hierarchy, and granularity in order to uncover the anisotropy of spatial data mining. The Deren Li method performs data preprocessing to prepare it for further knowledge discovery by selecting a weight for iteration in order to clean the observed spatial data as much as possible. In addition to the essential algorithms and techniques, the book provides application examples of spatial data mining in geographic information science and remote sensing. The practical projects include spatiotemporal video data mining for protecting public security, serial image mining on nighttime lights for assessing the severity of the Syrian Crisis, and the applications in the government project 'the Belt and Road Initiatives'.

Data Fusion and Data Mining for Power System Monitoring provides a comprehensive treatment of advanced data fusion and data mining techniques for power system monitoring with focus on use of synchronized phasor networks. Relevant statistical data mining techniques are given, and efficient methods to cluster and visualize data collected from multiple sensors are discussed. Both linear and nonlinear data-driven mining and fusion techniques are reviewed, with emphasis on the analysis and visualization of massive distributed data sets. Challenges involved in realistic monitoring, visualization, and analysis of observation data from actual events are also emphasized, supported by examples of relevant applications. Features Focuses on systematic illustration of data mining and fusion in power systems Covers issues of standards used in the power industry for data mining and data analytics Applications to a wide range of power networks are provided including distribution and transmission networks Provides holistic approach to the problem of data mining and data fusion using cutting-edge methodologies and technologies Includes applications to massive spatiotemporal data from simulations and actual events

Modelling Spatial and Spatial-Temporal Data: A Bayesian Approach is aimed at statisticians and quantitative social, economic and public health students and researchers who work with spatial and spatial-temporal data. It assumes a grounding in statistical theory up to the standard linear regression model. The book compares both hierarchical and spatial econometric modelling, providing both a reference and a teaching text with exercises in each chapter. The book provides a fully Bayesian, self-contained, treatment of the underlying statistical theory, with chapters dedicated to substantive applications. The book includes WinBUGS code and R code and all datasets are available online. Part I covers fundamental issues arising when modelling spatial and spatial-temporal data. Part II focuses on modelling cross-sectional spatial data and begins by describing exploratory methods that help guide the modelling process. There are then two theoretical chapters on Bayesian models and a chapter of applications. Two chapters follow on spatial econometric modelling, one describing different models, the other substantive applications. Part III discusses modelling spatial-temporal data, first introducing models for time series data. Exploratory methods for detecting different types of space-time interaction are presented followed by two chapters on the theory of space-time separable (without space-time interaction) and inseparable (with space-time interaction) models. An applications chapter includes: the evaluation of a policy intervention; analysing the temporal dynamics of crime hotspots; chronic disease surveillance; and testing for evidence of spatial spillovers in the spread of an infectious disease. A final chapter suggests some future directions and challenges.

Mapping COVID-19 in Space and Time

Spatial Cluster Modelling

Computer Network Security

A Bayesian Approach

Computational Science – ICCS 2021

Statistics for Spatio-Temporal Data

This book is a collection of original research papers that focus on recent developments in Spatial Analysis and Modelling with direct relevance to settlements and infrastructure. Topics include new types of data (such as simulation data), applications of methods to support decision-making, and investigations of human-environment data in order to recognize significance for structures, functions and processes of attributes. Research incorporated ranges from theoretical through methodological to applied work. It is subdivided into four main parts: the first focusing on the research of settlements and infrastructure, the second studies aspects of Geographic Data Mining, the third presents contributions in the field of Spatial Modelling, System Dynamics and Geosimulation, and the fourth part is dedicated to Multi-Scale Representation and Analysis. The book is valuable to those with a scholarly interest in spatial sciences, urban and spatial planning, as well as anyone interested in spatial analysis and the planning of human settlements and infrastructure. Most of the selected papers were originally presented at the "International Land Use Symposium (ILUS 2015): Trends in Spatial Analysis and Modelling of Settlements and Infrastructure" November 11-13 2015, in Dresden, Germany. Due to continual progress in the large-scale integration of semiconductor circuits, parallel computing principles can already be met in low-cost systems: numerous examples exist in image processing, for which special hardware is implementable with quite modest resources even by nonprofessional designers. Principles of content addressing, if thoroughly understood, can thereby be applied effectively using standard components. On the other hand, mass storage based on associative principles still exists only in the long term plans of computer technologists. This situation is somewhat confused by the fact that certain expectations are held for the development of new storage media such as optical memories and "spin glasses" (metal alloys with low-density magnetic impurities). Their technologies, however, may not ripen until after "fifth generation" computers have been built. It seems that software methods for content addressing, especially those based on hash coding principles, are still holding their position firmly, and a few innovations have been developed recently. As they need no special hardware, one might expect that

they will spread to a wide circle of users. This monograph is based on an extensive literature survey, most of which was published in the First Edition. I have added Chap. 2, which contains a review of more recent work. This updated book now has references to over 1200 original publications. In the editing of the new material, I received valuable help from Anneli Heimbürger, M. Sc., and Mrs. Leila Koivisto.

Geographical Information Systems is a computer system used to capture, store, analyze and display information related to positions on the Earth's surface. It has the ability to show multiple types of information on multiple geographical locations in a single map, enabling users to assess patterns and relationships between different information points, a crucial component for multiple aspects of modern life and industry. This 3-volume reference provides an up-to-date account of this growing discipline through in-depth reviews authored by leading experts in the field. VOLUME EDITORS Thomas J. Cova The University of Utah, Salt Lake City, UT, United States Ming-Hsiang Tsou San Diego State University, San Diego, CA, United States Georg Bareth University of Cologne, Cologne, Germany Chunqiao Song University of California, Los Angeles, CA, United States Yan Song University of North Carolina at Chapel Hill, Chapel Hill, NC, United States Kai Cao National University of Singapore, Singapore Elisabete A. Silva University of Cambridge, Cambridge, United Kingdom Covers a rapidly expanding discipline, providing readers with a detailed overview of all aspects of geographic information systems, principles and applications Emphasizes the practical, socioeconomic applications of GIS Provides readers with a reliable, one-stop comprehensive guide, saving them time in searching for the information they need from different sources

Developments in Geographic Information Technology have raised the expectations of users. A static map is no longer enough; there is now demand for a dynamic representation. Time is of great importance when operating on real world geographical phenomena, especially when these are dynamic. Researchers in the field of Temporal Geographical Infor

On the Move to Meaningful Internet Systems: OTM 2009

14th International Conference, Guimarães, Portugal, June 30 - July 3, 2004, Proceedings, Part I

New Contributions in Information Systems and Technologies

Volume 2

Content-Addressable Memories

Computer, Communication and Electrical Technology

Issues in Global, Public, Community, and Institutional Health: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Global, Public, Community, and Institutional Health. The editors have built Issues in Global, Public, Community, and Institutional Health: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Global, Public, Community, and Institutional Health in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Global, Public, Community, and Institutional Health: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Data mining or knowledge discovery refers to a variety of techniques having the intent of uncovering useful patterns and associations from large databases. The initial steps of data mining are concerned with preparation of data, including data cleaning intended to resolve errors and missing data and integration of data from multiple heterogeneous sources. Next are the steps needed to prepare for actual data mining including the selection of the specific data relevant to the task and the transformation of this data into a format required by the data mining approach. Finally specific data mining algorithms such as class description, association rules and classification clustering are applied. There are specific characteristics of spatial and temporal data, as found in GIS and multi-media data, that make knowledge discovery in this domain more complex than in mining ordinary data such as found in typical business sales applications. Here we provide a survey of work in spatio-temporal data mining emphasizing the special characteristics. An overview is given of different sources and types of geospatial, oceanographic and meteorological data and the associated issues inherent in their use in knowledge discovery. This book constitutes the refereed proceedings of the 13th International Conference entitled Beyond Databases, Architectures and Structures, BDAS 2017, held in Ustron, Poland, in May/June 2017. It consists of 44 carefully reviewed papers selected from 118 submissions. The papers are organized in topical sections, namely big data and cloud computing; artificial intelligence, data mining and knowledge discovery; architectures, structures and algorithms for efficient data processing; text mining, natural language processing, ontologies and semantic web; bioinformatics and biological data analysis; industrial applications; data mining tools, optimization and compression. In the spatial or spatio-temporal context, specifying the correct covariance function is fundamental to obtain efficient predictions, and to understand the underlying physical process of interest. This book focuses on covariance and variogram functions, their role in prediction, and appropriate choice of these functions in applications. Both

recent and more established methods are illustrated to assess many common assumptions on these functions, such as, isotropy, separability, symmetry, and intrinsic correlation. After an extensive introduction to spatial methodology, the book details the effects of common covariance assumptions and addresses methods to assess the appropriateness of such assumptions for various data structures. Key features: An extensive introduction to spatial methodology including a survey of spatial covariance functions and their use in spatial prediction (kriging) is given. Explores methodology for assessing the appropriateness of assumptions on covariance functions in the spatial, spatio-temporal, multivariate spatial, and point pattern settings. Provides illustrations of all methods based on data and simulation experiments to demonstrate all methodology and guide to proper usage of all methods. Presents a brief survey of spatial and spatio-temporal models, highlighting the Gaussian case and the binary data setting, along with the different methodologies for estimation and model fitting for these two data structures. Discusses models that allow for anisotropic and nonseparable behaviour in covariance functions in the spatial, spatio-temporal and multivariate settings. Gives an introduction to point pattern models, including testing for randomness, and fitting regular and clustered point patterns. The importance and assessment of isotropy of point patterns is detailed. Statisticians, researchers, and data analysts working with spatial and space-time data will benefit from this book as well as will graduate students with a background in basic statistics following courses in engineering, quantitative ecology or atmospheric science.

Decision-Support and Planning Strategies

Proceedings of the International Conference on Advancement of Computer Communication and Electrical Technology (ACCET 2016), West Bengal, India, 21-22 October 2016

Second International Conference, ADMA 2006, Xi'an, China, August 14-16, 2006, Proceedings

Spatial Statistics and Spatio-Temporal Data

Mathematical Morphology in Geomorphology and GISci

New Trends

This volume contains technical papers and panel position papers selected from the proceedings of the International Symposium on Information Systems and Technologies for Network Society, held together with the IPSJ (information processing society of Japan) National Convention, in September 1997. Papers were submitted from all over the world, especially from Japan, Korea and China. Since these countries are believed to form one of the major computer manufacturing centers in the world, a panel on "Computer Science Education for the 21st Century" was set up. A special session on the Japanese project on Software Engineering invited representative researchers from the project, which is supported by the Ministry of Education, Japan. Here are the proceedings of the 2nd International Conference on Advanced Data Mining and Applications, ADMA 2006, held in Xi'an, China, August 2006. The book presents 41 revised full papers and 74 revised short papers together with 4 invited papers. The papers are organized in topical sections on association rules, classification, clustering, novel algorithms, multimedia mining, sequential data mining and time series mining, web mining, biomedical mining, advanced applications, and more.

The First International Conference on Advancement of Computer, Communication and Electrical Technology focuses on key technologies and recent progress in computer vision, information technology applications, VLSI, signal processing, power electronics & drives, and application of sensors & transducers, etc. Topics in this conference include: Computer Science This conference encompassed relevant topics in computer science such as computer vision & intelligent system, networking theory, and application of information technology. Communication Engineering To enhance the theory & technology of communication engineering, ACCET 2016 highlighted the state-of-the-art research work in the field of VLSI, optical communication, and signal processing of various data formatting. Research work in the field of microwave engineering, cognitive radio and networks are also included. Electrical Technology The state-of-the-art research topic in the field of electrical & instrumentation engineering is included in this conference such as power system stability & protection, non-conventional energy resources, electrical drives, and biomedical engineering. Research work in the area of optimization and application in control, measurement & instrumentation are included as well.

It is our pleasure to invite you to participate in the 2nd IEEE International Workshop on Arabic and derived Script Analysis and Recognition (ASAR 2018), which will be hosted by the Alan Turing Institute, London, in collaboration with the LORIA laboratory (University Lorraine, France) and REGIM Lab (University of Sfax, Tunisia), and will be held in London (United Kingdom) on March 12-14, 2018. The ASAR workshop provides an excellent opportunity for researchers and practitioners at all levels of experience to meet colleagues and to share new ideas and knowledge about Arabic and derived script document analysis and recognition methods. The workshop enjoys strong participation from researchers in both industry and academia.

Issues in Global, Public, Community, and Institutional Health: 2011 Edition

Beyond Databases, Architectures and Structures. Towards Efficient Solutions for Data Analysis and Knowledge Representation

Periodic Pattern Mining

Digital Urban Modeling and Simulation

Advances in Spatio-Temporal Analysis

Geographic Data Mining and Knowledge Discovery

This SpringerBrief presents the fundamental concepts of a specialized class of data stream, spatio-temporal data streams, and demonstrates their distributed processing using Big Data frameworks and platforms. It explores a consistent framework which facilitates a thorough understanding of all different facets of the technology, from basic definitions to state-of-the-art techniques. Key topics include spatio-temporal continuous queries, distributed stream processing, SQL-like language embedding, and trajectory stream clustering. Over the course of the book, the reader will become familiar with spatio-temporal data streams management and data flow processing, which enables the analysis of huge volumes of location-aware continuous data streams. Applications range from mobile object tracking and real-time intelligent transportation systems to traffic monitoring and complex event processing. Spatio-Temporal Data Streams is a valuable resource for researchers studying spatio-temporal data streams and Big Data analytics, as well as data engineers and data scientists solving data management and analytics problems associated with this class of data.

This book constitutes the refereed proceedings of the 7th International Conference on Mathematical Methods, Models, and Architectures for Computer Network Security, MMM-ACNS 2017, held in Warsaw, Poland, in August 2017. The 12 revised full papers, 13 revised short presentations, and 3 invited papers were carefully reviewed and selected from a total of 40 submissions. The papers are organized in topical sections on Critical Infrastructure Protection and Visualization; Security and Resilience of Network Systems; Adaptive Security; Anti-malware Techniques: Detection, Analysis, Prevention; Security of Emerging Technologies; Applied Cryptography; New Ideas and Paradigms for Security.

Handbook of Spatial Epidemiology explains how to model epidemiological problems and improve inference about disease etiology from a geographical perspective. Top epidemiologists, geographers, and statisticians share interdisciplinary viewpoints on analyzing spatial data and space-time variations in disease incidences. These analyses can provide important information that leads to better decision making in public health. The first part of the book addresses general issues related to epidemiology, GIS, environmental studies, clustering, and ecological analysis. The second part presents basic statistical methods used in spatial epidemiology, including fundamental likelihood principles, Bayesian methods, and testing and nonparametric approaches. With a focus on special methods, the third part describes geostatistical models, splines, quantile regression, focused clustering, mixtures, multivariate methods, and much more. The final part examines special problems and application areas, such as residential history analysis, segregation, health services research, health surveys, infectious disease, veterinary topics, and health surveillance and clustering. Spatial epidemiology, also known as disease mapping, studies the geographical or spatial distribution of health outcomes. This handbook offers a wide-ranging overview of state-of-the-art approaches to determine the relationships between health and various risk factors, empowering researchers and policy makers to tackle public health problems.

Research has generated a number of advances in methods for spatial cluster modelling in recent years, particularly in the area of Bayesian cluster modelling. Along with these advances has come an explosion of interest in the potential applications of this work, especially in epidemiology and genome research. In one integrated volume, this book reviews the state-of-the-art in spatial clustering and spatial cluster modelling, bringing together research and applications previously scattered throughout the literature. It begins with an overview of the field, then presents a series of chapters that illuminate the nature and purpose of cluster modelling within different application areas, including astrophysics, epidemiology, ecology, and imaging. The focus then shifts to methods, with discussions on point and object process modelling, perfect sampling of cluster processes, partitioning in space and space-time, spatial and spatio-temporal process modelling, nonparametric methods for clustering, and spatio-temporal cluster modelling. Many figures, some in full color, complement the text, and a single section of references cited makes it easy to locate source material. Leading specialists in the field of cluster modelling authored each chapter, and an introduction by the editors to each chapter provides a cohesion not typically found in contributed works. Spatial Cluster Modelling thus offers a singular opportunity to explore this exciting new field, understand its techniques, and apply them in your own research.

Spatio-Temporal Data Mining and Knowledge Discovery: Issues Overview

Spatial Big Data Science

2018 IEEE 2nd International Workshop on Arabic and Derived Script Analysis and Recognition (ASAR)

7th International Conference on Mathematical Methods, Models, and Architectures for Computer Network Security, MMM-ACNS 2017, Warsaw, Poland, August 28-30, 2017, Proceedings

Applying Graph Theory in Ecological Research

Outlier Detection for Temporal Data

This book is thematically positioned at the intersections of Urban Design, Architecture, Civil Engineering and Computer Science, and it has the goal to provide specialists coming from respective fields a multi-angle overview of state-of-the-art work currently being carried out. It addresses both newcomers who wish to obtain more knowledge about this growing area of interest, as well as established researchers and practitioners who want to keep up to date. In terms of organization, the volume starts out with chapters looking at the domain at a wide-angle and then moves focus towards technical viewpoints and approaches.

This book constitutes the proceedings of the 11th International Symposium on Web and Wireless Geographical Information Systems, W2GIS 2012, held in Naples, Italy, in April 2012. The 13 full and 4 short papers presented in this book were carefully reviewed and selected from 32 submissions. The papers are organized in topical sections named: 3D and multimodal spatial interaction; positioning; spatial human-computer interaction; trajectory analysis; geo semantics; and sensor networks.

"This book is an updated look at the state of technology in the field of data mining and analytics offering the latest technological, analytical, ethical, and commercial perspectives on topics in data mining"--Provided by publisher.

Nonlinear dynamical systems and the formation of spatio-temporal patterns play an important role in current research on partial differential equations. This book contains articles on topics of current interest in applications of dynamical systems theory to problems of pattern formation in space and time. Topics covered include aspects of lattice dynamical systems, convection in fluid layers with large aspect ratios, mixed mode oscillations and canards, bacterial remediation of waste, gyroscopic systems, data clustering, and the second part of Hilbert's 16th problem. Most of the book consists of expository survey material, and so can serve

as a source of convenient entry points to current research topics in nonlinear dynamics and pattern formation. This volume arose from a workshop held at the Fields Institute in December of 2003, honoring Professor William E Langford's fundamental work on the occasion of his sixtieth birthday.

Scan Statistics

Data Fusion and Data Mining for Power System Monitoring

Information Systems And Technologies For Network Society: Proceedings Of The Ipsj International Symposium

Trends in Spatial Analysis and Modelling

21st International Conference, Krakow, Poland, June 16–18, 2021, Proceedings, Part I

Spatial Data Mining

In many statistical applications, scientists have to analyze the occurrence of observed clusters of events in time or space. Scientists are especially interested in determining whether an observed cluster of events has occurred by chance if it is assumed that the events are distributed independently and uniformly over time or space. Scan statistics have relevant applications in many areas of science and technology including geology, geography, medicine, minefield detection, molecular biology, photography, quality control and reliability theory and radio-optics.

Outlier (or anomaly) detection is a very broad field which has been studied in the context of a large number of research areas like statistics, data mining, sensor networks, environmental science, distributed systems, spatio-temporal mining, etc. Initial research in outlier detection focused on time series-based outliers (in statistics). Since then, outlier detection has been studied on a large variety of data types including high-dimensional data, uncertain data, stream data, network data, time series data, spatial data, and spatio-temporal data. While there have been many tutorials and surveys for general outlier detection, we focus on outlier detection for temporal data in this book. A large number of applications generate temporal datasets. For example, in our everyday life, various kinds of records like credit, personnel, financial, judicial, medical, etc., are all temporal. This stresses the need for an organized and detailed study of outliers with respect to such temporal data. In the past decade, there has been a lot of research on various forms of temporal data including consecutive data snapshots, series of data snapshots and data streams. Besides the initial work on time series, researchers have focused on rich forms of data including multiple data streams, spatio-temporal data, network data, community distribution data, etc. Compared to general outlier detection, techniques for temporal outlier detection are very different. In this book, we will present an organized picture of both recent and past research in temporal outlier detection. We start with the basics and then ramp up the reader to the main ideas in state-of-the-art outlier detection techniques. We motivate the importance of temporal outlier detection and brief the challenges beyond usual outlier detection. Then, we list down a taxonomy of proposed techniques for temporal outlier detection. Such techniques broadly include statistical techniques (like AR models, Markov models, histograms, neural networks), distance- and density-based approaches, grouping-based approaches (clustering, community detection), network-based approaches, and spatio-temporal outlier detection approaches. We summarize by presenting a wide collection of applications where temporal outlier detection techniques have been applied to discover interesting outliers. Table of Contents: Preface / Acknowledgments / Figure Credits / Introduction and Challenges / Outlier Detection for Time Series and Data Sequences / Outlier Detection for Data Streams / Outlier Detection for Distributed Data Streams / Outlier Detection for Spatio-Temporal Data / Outlier Detection for Temporal Network Data / Applications of Outlier Detection for Temporal Data / Conclusions and Research Directions / Bibliography / Authors' Biographies

This book contains a selection of articles from The 2015 World Conference on Information Systems and Technologies (WorldCIST'15), held between the 1st and 3rd of April in Funchal, Madeira, Portugal, a global forum for researchers and practitioners to present and discuss recent results and innovations, current trends, professional experiences and challenges of modern Information Systems and Technologies research, technological development and applications. The main topics covered are: Information and Knowledge Management; Organizational Models and Information Systems; Intelligent and Decision Support Systems; Big Data Analytics and Applications; Software Systems, Architectures, Applications and Tools; Multimedia Systems and Applications; Computer Networks, Mobility and Pervasive Systems; Human-Computer Interaction; Health Informatics; Information Technologies in Education; Information Technologies in Radio communications.

Mathematical Morphology in Geomorphology and GISci presents a multitude of mathematical morphological approaches for processing and analyzing digital images in quantitative geomorphology and geographic information science (GISci). Covering many interdisciplinary applications, the book explains how to use mathematical morphology not only to perform

Deep Learning on Graphs

13th International Conference, BDAS 2017, Ustroń, Poland, May 30 - June 2, 2017, Proceedings

Handbook of Spatial Epidemiology

Modeling, Computing and Data Handling Methodologies for Maritime Transportation

Modelling Spatial and Spatial-Temporal Data: A Bayesian Approach

This book clearly describes the many applications of graph theory to ecological questions, providing instruction and encouragement to researchers.

Emerging Spatial Big Data (SBD) has transformative potential in solving many grand societal challenges such as water resource management, food security, disaster response, and transportation. However, significant computational challenges exist in analyzing SBD due to the unique spatial characteristics including spatial autocorrelation, anisotropy, heterogeneity, multiple scales and resolutions which is illustrated in this book. This book also discusses current techniques for, spatial big data science with a particular focus on classification techniques for earth observation imagery big data. Specifically, the authors introduce several recent spatial classification techniques, such as spatial decision trees and spatial ensemble learning. Several potential future research directions are also discussed. This book targets an interdisciplinary audience including computer scientists, practitioners and researchers working in the field of data mining, big data, as well as domain scientists working in earth science (e.g., hydrology, disaster), public safety and public health. Advanced level students in computer science will also find this book useful as a reference.

This book describes the spatial and temporal perspectives on COVID-19 and its impacts and deepens our understanding of human dynamics during and after the global pandemic. It critically examines the role smart city technologies play in

shaping our lives in the years to come. The book covers a wide-range of issues related to conceptual, theoretical and data issues, analysis and modeling, and applications and policy implications such as socio-ecological perspectives, geospatial data ethics, mobility and migration during COVID-19, population health resilience and much more. With accelerated pace of technological advances and growing divide on political and policy options, a better understanding of disruptive global events such as COVID-19 with spatial and temporal perspectives is an imperative and will make the ultimate difference in public health and economic decision making. Through in-depth analyses of concepts, data, methods, and policies, this book stimulates future studies on global pandemics and their impacts on society at different levels.

Advanced Data Mining and Applications Second International Conference, ADMA 2006, Xi'an, China, August 14-16, 2006, Proceedings Springer Science & Business Media

1991 Statistical Summary

Exploring Advances in Interdisciplinary Data Mining and Analytics: New Trends

Proceeding of the International Conference on Computer Networks, Big Data and IoT (ICCBI - 2018)

Theory and Application

Computational Science and Its Applications - ICCSA 2014

11th International Symposium, W2GIS 2012, Naples, Italy, April 12-13, 2012, Proceedings

The six-volume set LNCS 8579–8584 constitutes the refereed proceedings of the 14th International Conference on Computational Science and Its Applications, ICCSA 2014, held in Guimarães, Portugal, in June/July 2014. The 347 revised papers presented in 30 workshops and a special track were carefully reviewed and selected from 1167 initial submissions. The 289 papers presented in the workshops cover various areas in computational science ranging from computational science technologies to specific areas of computational science such as computational geometry and security.

This book presents the proceedings of the International Conference on Computer Networks, Big Data and IoT (ICCBI-2018), held on December 19–20, 2018 in Madurai, India. In recent years, advances in information and communication technologies [ICT] have collectively aimed to streamline the evolution of internet applications. In this context, increasing the ubiquity of emerging internet applications with an enhanced capability to communicate in a distributed environment has become a major need for existing networking models and applications. To achieve this, Internet of Things [IoT] models have been developed to facilitate a smart interconnection and information exchange among modern objects – which plays an essential role in every aspect of our lives. Due to their pervasive nature, computer networks and IoT can easily connect and engage effectively with their network users. This vast network continuously generates data from heterogeneous devices, creating a need to utilize big data, which provides new and unprecedented opportunities to process these huge volumes of data. This International Conference on Computer Networks, Big Data, and Internet of Things [ICCBI] brings together state-of-the-art research work, which briefly describes advanced IoT applications in the era of big data. As such, it offers valuable insights for researchers and scientists involved in developing next-generation, big-data-driven IoT applications to address the real-world challenges in building a smartly connected environment.

This book is one of very few in the maritime literature that solely focus on the latest developments in information technology (IT) methodologies in this field. It provides the reader with a concise overview of how IT can truly improve the efficacy of operations in the maritime industry. It consists of seven chapters that address a range of topics related to the synergy between Computer Science and Maritime Science. Specifically, Chapters 1 and 2 explore two important problems in maritime logistics pertaining to quayside operational planning, while Chapters 3 and 4 focus on maritime routing methodologies. Chapters 5 and 6 present decision-making support systems for safe shipping and port security. Last, Chapter 7 presents simulation methodologies for modeling maritime traffic. The intended readership of the book spans both an academic audience and professionals in the areas of Operational Research, Transportation Science, and Maritime Science interested in applying IT methodologies in their areas of expertise.

This two-volume set LNCS 5870/5871 constitutes the refereed proceedings of the four confederated international conferences on Cooperative Information Systems (CoopIS 2009), Distributed Objects and Applications (DOA 2009), Information Security (IS 2009), and Ontologies, Databases and Applications of Semantics (ODBASE 2009), held as OTM 2009 in Vilamoura, Portugal, in November 2009. The 83 revised full papers presented together with 4 keynote talks were carefully reviewed and selected from a total of 234 submissions. Corresponding to the four OTM 2009 main conferences CoopIS, DOA, IS, and ODBASE the papers are organized in topical sections on workflow; process models; ontology challenges; network complexity; modeling cooperation; information complexity; infrastructure; information; aspect-oriented approaches for distributed middleware; distributed algorithms and communication protocols; distributed infrastructures for cluster and Grid computing; object-based, component-based, resource-oriented, event-oriented, and service-oriented middleware; peer-to-peer and centralized infrastructures; performance analysis of distributed computing systems; reliability, fault tolerance, quality of service, and real time support; self properties in distributed middleware; software engineering for*

distributed middleware systems; security and privacy in a connected world; ubiquitous and pervasive computing; information systems security; privacy and authentication; security policies and verification; managing ontologies; using ontologies; event processing; dealing with heterogeneity; building knowledge bases; and XML and XML schema.

Forest Health Monitoring

Understanding the Spatial and Temporal Dynamics of a Global Pandemic

Classification Techniques for Earth Observation Imagery

Theory, Algorithms, and Applications

Advanced Data Mining and Applications