

# Intelligent Data Analysis

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*Intelligent Data Analysis*

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## HANA GRANT

Guide to Intelligent Data Science Springer

Models and methods for operational risks assessment and mitigation are gaining importance in financial institutions, healthcare organizations, industry, businesses and organisations in general. This book introduces modern Operational Risk Management and describes how various data sources of different types, both numeric and semantic sources such as text can be integrated and analyzed. The book also demonstrates how Operational Risk Management is synergetic to other risk management activities such as Financial Risk Management and Safety Management. Operational Risk Management: a practical approach to intelligent data analysis provides practical and tested methodologies for combining structured and unstructured, semantic-based data, and numeric data, in Operational Risk Management (OpR) data analysis. Key Features: The book is presented in four parts: 1) Introduction to OpR Management, 2) Data for OpR Management, 3) OpR Analytics and 4) OpR Applications and its Integration with other Disciplines. Explores integration of semantic, unstructured textual data, in Operational Risk Management. Provides novel techniques for combining qualitative and quantitative information to assess risks and design mitigation strategies. Presents a comprehensive treatment of "near-misses" data and incidents in Operational Risk Management. Looks at case studies in the financial and industrial sector. Discusses application of ontology engineering to model knowledge used in Operational Risk Management. Many real life examples are presented, mostly based on the MUSING project co-funded by the EU FP6 Information Society Technology Programme. It provides a unique multidisciplinary perspective on the important and evolving topic of Operational Risk Management. The book will be useful to operational risk practitioners, risk managers in banks, hospitals and industry looking for modern approaches to risk management that combine an analysis of structured and unstructured data. The book will also benefit academics interested in research in this field, looking for techniques developed in response to real world problems.

## DATA ANALYTICS FOR INTELLIGENT TRANSPORTATION SYSTEMS

CRC Press

This book is a comprehensive introduction to the methods and algorithms of modern data analytics. It provides a sound mathematical basis, discusses advantages and drawbacks of different approaches, and enables the reader to design and implement data analytics solutions for real-world applications. This book has been used for more than ten years in the Data Mining course at the Technical University of Munich. Much of the content is based on the results of industrial research and development projects at Siemens.

*An Introduction* Springer Nature

This book collects research works of data-driven medical diagnosis done via Artificial Intelligence based solutions, such as Machine Learning, Deep Learning and Intelligent Optimization. Physical devices powered with Artificial Intelligence are gaining importance in diagnosis and healthcare. Medical data from different sources can also be analyzed via Artificial Intelligence techniques for more effective results.

*Intelligent Data Analysis: Developing New Methodologies Through Pattern Discovery and Recovery* John Wiley & Sons

Big Data Analytics and Intelligence is essential reading for researchers and experts working in the fields of health care, data

science, analytics, the internet of things, and information retrieval.

*15th International Symposium, IDA 2016, Stockholm, Sweden, October 13-15, 2016, Proceedings* Springer

This second and revised edition contains a detailed introduction to the key classes of intelligent data analysis methods. The twelve coherently written chapters by leading experts provide complete coverage of the core issues. The first half of the book is devoted to the discussion of classical statistical issues. The following chapters concentrate on machine learning and artificial intelligence, rule induction methods, neural networks, fuzzy logic, and stochastic search methods. The book concludes with a chapter on visualization and an advanced overview of IDA processes.

*Intelligent Data Analysis for COVID-19 Pandemic* Springer  
 This volume comprises eight well-versed contributed chapters devoted to report the latest findings on the intelligent approaches to multimedia data analysis. Multimedia data is a combination of different discrete and continuous content forms like text, audio, images, videos, animations and interactional data. At least a single continuous media in the transmitted information generates multimedia information. Due to these different types of varieties, multimedia data present varied degrees of uncertainties and imprecision, which cannot be easy to deal by the conventional computing paradigm. Soft computing technologies are quite efficient to handle the imprecision and uncertainty of the multimedia data and they are flexible enough to process the real-world information. Proper analysis of multimedia data finds wide applications in medical diagnosis, video surveillance, text annotation etc. This volume is intended to be used as a reference by undergraduate and post graduate students of the disciplines of computer science, electronics and telecommunication, information science and electrical engineering. THE SERIES: FRONTIERS IN COMPUTATIONAL INTELLIGENCE The series Frontiers In Computational Intelligence is envisioned to provide comprehensive coverage and understanding of cutting edge research in computational intelligence. It intends to augment the scholarly discourse on all topics relating to the advances in artificial life and machine learning in the form of metaheuristics, approximate reasoning, and robotics. Latest research findings are coupled with applications to varied domains of engineering and computer sciences. This field is steadily growing especially with the advent of novel machine learning algorithms being applied to different domains of engineering and technology. The series brings together leading researchers that intend to continue to advance the field and create a broad knowledge about the most recent state of the art.

*Intelligent Multimedia Data Analysis* Emerald Group Publishing  
 This book constitutes the refereed proceedings of the 5th International Conference on Intelligent Data Analysis, IDA 2003, held in Berlin, Germany in August 2003. The 56 revised papers presented were carefully reviewed and selected from 180 submissions. The papers are organized in topical sections on machine learning, probability and topology, classification and pattern recognition, clustering, applications, modeling, and data processing.

## ADVANCES IN INTELLIGENT DATA ANALYSIS AND APPLICATIONS

Springer

Making use of data is not anymore a niche project but central to almost every project. With access to massive compute resources and vast amounts of data, it seems at least in principle possible to solve any problem. However, successful data science projects

result from the intelligent application of: human intuition in combination with computational power; sound background knowledge with computer-aided modelling; and critical reflection of the obtained insights and results. Substantially updating the previous edition, then entitled Guide to Intelligent Data Analysis, this core textbook continues to provide a hands-on instructional approach to many data science techniques, and explains how these are used to solve real world problems. The work balances the practical aspects of applying and using data science techniques with the theoretical and algorithmic underpinnings from mathematics and statistics. Major updates on techniques and subject coverage (including deep learning) are included. Topics and features: guides the reader through the process of data science, following the interdependent steps of project understanding, data understanding, data blending and transformation, modeling, as well as deployment and monitoring; includes numerous examples using the open source KNIME Analytics Platform, together with an introductory appendix; provides a review of the basics of classical statistics that support and justify many data analysis methods, and a glossary of statistical terms; integrates illustrations and case-study-style examples to support pedagogical exposition; supplies further tools and information at an associated website. This practical and systematic textbook/reference is a "need-to-have" tool for graduate and advanced undergraduate students and essential reading for all professionals who face data science problems. Moreover, it is a "need to use, need to keep" resource following one's exploration of the subject.

## 6TH INTERNATIONAL SYMPOSIUM ON INTELLIGENT DATA ANALYSIS, IDA 2005, MADRID, SPAIN, SEPTEMBER 8-10, 2005, PROCEEDINGS

Morgan Kaufmann

Each passing year bears witness to the development of ever more powerful computers, increasingly fast and cheap storage media, and even higher bandwidth data connections. This makes it easy to believe that we can now - at least in principle - solve any problem we are faced with so long as we only have enough data. Yet this is not the case. Although large databases allow us to retrieve many different single pieces of information and to compute simple aggregations, general patterns and regularities often go undetected. Furthermore, it is exactly these patterns, regularities and trends that are often most valuable. To avoid the danger of "drowning in information, but starving for knowledge" the branch of research known as data analysis has emerged, and a considerable number of methods and software tools have been developed. However, it is not these tools alone but the intelligent application of human intuition in combination with computational power, of sound background knowledge with computer-aided modeling, and of critical reflection with convenient automatic model construction, that results in successful intelligent data analysis projects. Guide to Intelligent Data Analysis provides a hands-on instructional approach to many basic data analysis techniques, and explains how these are used to solve data analysis problems. Topics and features: guides the reader through the process of data analysis, following the interdependent steps of project understanding, data understanding, data preparation, modeling, and deployment and monitoring; equips the reader with the necessary information in order to obtain hands-on experience of the topics under discussion; provides a review of the basics of classical statistics that support and justify many data analysis methods, and a glossary of statistical terms; includes numerous examples using R and KNIME, together with appendices introducing the open source software; integrates

illustrations and case-study-style examples to support pedagogical exposition. This practical and systematic textbook/reference for graduate and advanced undergraduate students is also essential reading for all professionals who face data analysis problems. Moreover, it is a book to be used following one's exploration of it. Dr. Michael R. Berthold is Nycomed-Professor of Bioinformatics and Information Mining at the University of Konstanz, Germany. Dr. Christian Borgelt is Principal Researcher at the Intelligent Data Analysis and Graphical Models Research Unit of the European Centre for Soft Computing, Spain. Dr. Frank Höppner is Professor of Information Systems at Ostfalia University of Applied Sciences, Germany. Dr. Frank Klawonn is a Professor in the Department of Computer Science and Head of the Data Analysis and Pattern Recognition Laboratory at Ostfalia University of Applied Sciences, Germany. He is also Head of the Bioinformatics and Statistics group at the Helmholtz Centre for Infection Research, Braunschweig, Germany.

*9th International Symposium, IDA 2010, Tucson, AZ, USA, May 19-21, 2010, Proceedings* Springer Nature  
**Big Data Analytics for Sensor-Network Collected Intelligence** explores state-of-the-art methods for using advanced ICT technologies to perform intelligent analysis on sensor collected data. The book shows how to develop systems that automatically detect natural and human-made events, how to examine people's behaviors, and how to unobtrusively provide better services. It begins by exploring big data architecture and platforms, covering the cloud computing infrastructure and how data is stored and visualized. The book then explores how big data is processed and managed, the key security and privacy issues involved, and the approaches used to ensure data quality. In addition, readers will find a thorough examination of big data analytics, analyzing statistical methods for data analytics and data mining, along with a detailed look at big data intelligence, ubiquitous and mobile computing, and designing intelligence system based on context and situation. Indexing: The books of this series are submitted to EI-Compendex and SCOPUS Contains contributions from noted scholars in computer science and electrical engineering from around the globe Provides a broad overview of recent developments in sensor collected intelligence Edited by a team comprised of leading thinkers in big data analytics

**Intelligent Data Analysis** Academic Press

This book presents intelligent data analysis as a tool to fight against COVID-19 pandemic. The intelligent data analysis includes machine learning, natural language processing, and computer vision applications to teach computers to use big data-based models for pattern recognition, explanation, and prediction. These functions are discussed in detail in the book to recognize (diagnose), predict, and explain (treat) COVID-19 infections, and help manage socio-economic impacts. It also discusses primary warnings and alerts; tracking and prediction; data dashboards; diagnosis and prognosis; treatments and cures; and social control by the use of intelligent data analysis. It provides analysis reports, solutions using real-time data, and solution through web applications details.

CRC Press

**Practical Machine Learning for Data Analysis Using Python** is a problem solver's guide for creating real-world intelligent systems. It provides a comprehensive approach with concepts, practices, hands-on examples, and sample code. The book teaches readers the vital skills required to understand and solve different problems with machine learning. It teaches machine learning techniques necessary to become a successful practitioner,

through the presentation of real-world case studies in Python machine learning ecosystems. The book also focuses on building a foundation of machine learning knowledge to solve different real-world case studies across various fields, including biomedical signal analysis, healthcare, security, economics, and finance. Moreover, it covers a wide range of machine learning models, including regression, classification, and forecasting. The goal of the book is to help a broad range of readers, including IT professionals, analysts, developers, data scientists, engineers, and graduate students, to solve their own real-world problems. Offers a comprehensive overview of the application of machine learning tools in data analysis across a wide range of subject areas Teaches readers how to apply machine learning techniques to biomedical signals, financial data, and healthcare data Explores important classification and regression algorithms as well as other machine learning techniques Explains how to use Python to handle data extraction, manipulation, and exploration techniques, as well as how to visualize data spread across multiple dimensions and extract useful features

**A Practical Approach to Intelligent Data Analysis** Springer  
 This volume of *Advances in Intelligent Systems and Computing* contains accepted papers presented in the main track of ECC 2015, the Second Euro-China Conference on Intelligent Data Analysis and Applications. The aim of ECC is to provide an internationally respected forum for scientific research in the broad area of intelligent data analysis, computational intelligence, signal processing, and all associated applications of AIs. The second edition of ECC was organized jointly by VSB - Technical University of Ostrava, Czech Republic, and Fujian University of Technology, Fuzhou, China. The conference, organized under the patronage of Mr. Miroslav Novak, President of the Moravian-Silesian Region, took place in late June and early July 2015 in the Campus of the VSB - Technical University of Ostrava, Czech Republic.

*AI and Machine Learning Paradigms for Health Monitoring System*  
 Walter de Gruyter GmbH & Co KG

"This book explores the potential of utilizing medical data through the implementation of developed models in practical applications"--Provided by publisher.

**Intelligent Data Warehousing** IGI Global

**Intelligent Data-Analytics for Condition Monitoring: Smart Grid Applications** looks at intelligent and meaningful uses of data required for an optimized, efficient engineering processes. In addition, the book provides application perspectives of various deep learning models for the condition monitoring of electrical equipment. With chapters discussing the fundamentals of machine learning and data analytics, the book is divided into two parts, including i) The application of intelligent data analytics in Solar PV fault diagnostics, transformer health monitoring and faults diagnostics, and induction motor faults and ii) Forecasting issues using data analytics which looks at global solar radiation forecasting, wind data forecasting, and more. This reference is useful for all engineers and researchers who need preliminary knowledge on data analytics fundamentals and the working methodologies and architecture of smart grid systems. Features deep learning methodologies in smart grid deployment and maintenance applications Includes coding for intelligent data analytics for each application Covers advanced problems and solutions of smart grids using advance data analytic techniques

**An Introduction** Springer Science & Business Media

This book constitutes the refereed proceedings of the 9th International Conference on Intelligent Data Analysis, IDA 2010,

held in Tucson, AZ, USA in May 2010. The 21 revised papers presented together with 2 invited papers were carefully reviewed and selected from more than 40 submissions. All current aspects of intelligent data analysis are addressed, particularly intelligent support for modeling and analyzing complex, dynamical systems. Topics covered are end-to-end software systems; modeling complex systems such as gene regulatory networks, economic systems, ecological systems, resources such as water, and dynamical social systems such as online communities; and robustness, scaling properties and other usability issues.

**8th International Symposium on Intelligent Data Analysis, IDA 2009, Lyon, France, August 31 - September 2, 2009, Proceedings** Springer Science & Business Media

This book embodies principles and applications of advanced soft computing approaches in engineering, healthcare and allied domains directed toward the researchers aspiring to learn and apply intelligent data analytics techniques. The first part covers AI, machine learning and data analytics tools and techniques and their applications to the class of several hospital and health real-life problems. In the later part, the applications of AI, ML and data analytics shall be covered over the wide variety of applications in hospital, health, engineering and/or applied sciences such as the clinical services, medical image analysis, management support, quality analysis, bioinformatics, device analysis and operations. The book presents knowledge of experts in the form of chapters with the objective to introduce the theme of intelligent data analytics and discusses associated theoretical applications. At last, it presents simulation codes for the problems included in the book for better understanding for beginners.

**Models and Algorithms for Intelligent Data Analysis** Walter de Gruyter GmbH & Co KG

This book constitutes the refereed conference proceedings of the 15th International Conference on Intelligent Data Analysis, which was held in October 2016 in Stockholm, Sweden. The 36 revised full papers presented were carefully reviewed and selected from 75 submissions. The traditional focus of the IDA symposium series is on end-to-end intelligent support for data analysis. The symposium aims to provide a forum for inspiring research contributions that might be considered preliminary in other leading conferences and journals, but that have a potentially dramatic impact.

**BIG DATA ANALYTICS AND INTELLIGENCE**

Springer Science & Business Media

This book constitutes the refereed proceedings of the 4th International Conference on Intelligent Data Analysis, IDA 2001, held in Cascais, Portugal, in September 2001. The 37 revised full papers presented were carefully reviewed and selected from a total of almost 150 submissions. All current aspects of this interdisciplinary field are addressed; the areas covered include statistics, artificial intelligence, neural networks, machine learning, data mining, and interactive dynamic data visualization.

**From Data Gathering to Data Comprehension** Academic Press

This book is a comprehensive introduction to the methods and algorithms of modern data analytics. It provides a sound mathematical basis, discusses advantages and drawbacks of different approaches, and enables the reader to design and implement data analytics solutions for real-world applications. This book has been used for more than ten years in the Data Mining course at the Technical University of Munich. Much of the content is based on the results of industrial research and development projects at Siemens.

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