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Demystifying Big Data, Machine Learning, and Deep Learning for Healthcare Analytics - Pradeep N 2021-06-25

Demystifying Big Data, Machine Learning, and Deep Learning for Healthcare Analytics presents the changing world of data utilization, especially in clinical healthcare. Various techniques, methodologies, and algorithms are presented in this book to organize data in a structured manner that will assist physicians in the care of patients and help biomedical engineers and computer scientists understand the impact of these techniques on healthcare analytics. The book is divided into two parts: Part 1 covers big data aspects such as healthcare decision support systems and analytics-related topics. Part 2 focuses on the current frameworks and applications of deep learning and machine learning, and provides an outlook on future directions of research and development. The entire book takes a case study approach, providing a wealth of real-world case studies in the application chapters to act as a foundational reference for biomedical engineers, computer scientists, healthcare researchers, and clinicians. Provides a comprehensive reference for biomedical engineers, computer scientists, advanced industry practitioners, researchers, and clinicians to understand and develop healthcare analytics using advanced tools and technologies Includes in-depth illustrations of advanced techniques via dataset samples, statistical tables, and graphs with algorithms and computational methods for developing new applications in healthcare informatics Unique case study approach provides readers with insights for practical clinical implementation

Competing on Healthcare Analytics - J. Bryan Bennett 2016-04-02

The rate of change in the healthcare industry has been staggering. From Electronic Health Records to ICD-10 to

Population Health, few industries have undergone such change in such a short amount of time. The silver lining is the treasure trove of digital data, which will enable providers to analyze and compare information across thousands of patients instead of relying on the anecdotal evidence they previously used. To access this knowledge, organizations are turning to analytics. Unfortunately, many organizations are rushing to implement any type of healthcare analytics program without consideration of the steps that must take place to build an effective, long-term analytics solution. Competing on Healthcare Analytics is a practical guide to implementing population health analytics. The book makes a clear argument for how an analytics initiative should be implemented using Mr. Bennett's foundational approach and identifies the most critical success factors. Healthcare organizations should re-access their approach to implementing population health analytics after reading this book. This book includes: - A detailed healthcare transformation model which tracks the progression of analytics to become an "Analytics Focused" healthcare organization;- A discussion of the value of using the foundational approach;- Research studies performed with healthcare organization participants supporting the approach;- A healthcare organization readiness assessment;- An implementation roadmap with critical success factors;- A discussion on what it takes to be a healthcare analytics competitor.Professor Bennett has been presenting his approach to implementing population health analytics to audiences across the country to rave reviews since the summer of 2014. Now it is your turn to access this knowledge that has been honed through his work in healthcare as well as in other industries with clients such as Microsoft, BellSouth, Chase and many others.

Knowledge Modelling and

Big Data Analytics in Healthcare - Mayuri Mehta 2021-11

"This book focuses on automated analytical techniques for healthcare applications used to extract knowledge from a large amount of data. It brings together a variety of different aspects of the healthcare system and aids in the decision-making processes for healthcare professionals. Knowledge Modelling and Big Data Analytics in Healthcare: Advances and Applications connects four contemporary areas of research rarely brought together in one book: artificial intelligence, big data analytics, knowledge modelling, and healthcare. It presents state-of-the-art research from the healthcare sector, including research on medical imaging, healthcare analysis, and the applications of artificial intelligence in drug discovery. This book is intended for data scientists, academicians, and industry professionals in the healthcare sector"--

Machine Learning for Healthcare Analytics Projects - Eduonix Learning Solutions 2018-10-30

Create real-world machine learning solutions using NumPy, pandas, matplotlib, and scikit-learn Key FeaturesDevelop a range of healthcare analytics projects using real-world datasetsImplement key machine learning algorithms using a range of libraries from the Python ecosystemAccomplish intermediate-to-complex tasks by building smart AI applications using neural network methodologiesBook Description Machine Learning (ML) has changed the way organizations and individuals use data to improve the efficiency of a system. ML algorithms allow strategists to deal with a variety of structured, unstructured, and semi-structured data. Machine Learning for Healthcare Analytics Projects is packed with new approaches and methodologies for creating powerful solutions for

healthcare analytics. This book will teach you how to implement key machine learning algorithms and walk you through their use cases by employing a range of libraries from the Python ecosystem. You will build five end-to-end projects to evaluate the efficiency of Artificial Intelligence (AI) applications for carrying out simple-to-complex healthcare analytics tasks. With each project, you will gain new insights, which will then help you handle healthcare data efficiently. As you make your way through the book, you will use ML to detect cancer in a set of patients using support vector machines (SVMs) and k-Nearest neighbors (KNN) models. In the final chapters, you will create a deep neural network in Keras to predict the onset of diabetes in a huge dataset of patients. You will also learn how to predict heart diseases using neural networks. By the end of this book, you will have learned how to address long-standing challenges, provide specialized solutions for how to deal with them, and carry out a range of cognitive tasks in the healthcare domain. What you will learnExplore super imaging and natural language processing (NLP) to classify DNA sequencingDetect cancer based on the cell information provided to the SVMApply supervised learning techniques to diagnose autism spectrum disorder (ASD)Implement a deep learning grid and deep neural networks for detecting diabetesAnalyze data from blood pressure, heart rate, and cholesterol level tests using neural networksUse ML algorithms to detect autistic disordersWho this book is for Machine Learning for Healthcare Analytics Projects is for data scientists, machine learning engineers, and healthcare professionals who want to implement machine learning algorithms to build smart AI applications. Basic knowledge of Python or any programming language is expected to get the most from this book.

Data Science and Predictive Analytics - Ivo D. Dinov

2018-08-27

Over the past decade, Big Data have become ubiquitous in all economic sectors, scientific disciplines, and human activities. They have led to striking technological advances, affecting all human experiences. Our ability to manage, understand, interrogate, and interpret such extremely large, multisource, heterogeneous, incomplete, multiscale, and incongruent data has not kept pace with the rapid increase of the volume, complexity and proliferation of the deluge of digital information. There are three reasons for this shortfall. First, the volume of data is increasing much faster than the corresponding rise of our computational processing power (Kryder's law > Moore's law). Second, traditional discipline-bounds inhibit expeditious progress. Third, our education and training activities have fallen behind the accelerated trend of scientific, information, and communication advances. There are very few rigorous instructional resources, interactive learning materials, and dynamic training environments that support active data science learning. The textbook balances the mathematical foundations with dexterous demonstrations and examples of data, tools, modules and workflows that serve as pillars for the urgently needed bridge to close that supply and demand predictive analytic skills gap. Exposing the enormous opportunities presented by the tsunami of Big data, this textbook aims to identify specific knowledge gaps, educational barriers, and workforce readiness deficiencies. Specifically, it focuses on the development of a transdisciplinary curriculum integrating modern computational methods, advanced data science techniques, innovative biomedical applications, and impactful health analytics. The content of this graduate-level textbook fills a substantial gap in integrating modern engineering concepts, computational algorithms,

mathematical optimization, statistical computing and biomedical inference. Big data analytic techniques and predictive scientific methods demand broad transdisciplinary knowledge, appeal to an extremely wide spectrum of readers/learners, and provide incredible opportunities for engagement throughout the academy, industry, regulatory and funding agencies. The two examples below demonstrate the powerful need for scientific knowledge, computational abilities, interdisciplinary expertise, and modern technologies necessary to achieve desired outcomes (improving human health and optimizing future return on investment). This can only be achieved by appropriately trained teams of researchers who can develop robust decision support systems using modern techniques and effective end-to-end protocols, like the ones described in this textbook. • A geriatric neurologist is examining a patient complaining of gait imbalance and posture instability. To determine if the patient may suffer from Parkinson's disease, the physician acquires clinical, cognitive, phenotypic, imaging, and genetics data (Big Data). Most clinics and healthcare centers are not equipped with skilled data analytic teams that can wrangle, harmonize and interpret such complex datasets. A learner that completes a course of study using this textbook will have the competency and ability to manage the data, generate a protocol for deriving biomarkers, and provide an actionable decision support system. The results of this protocol will help the physician understand the entire patient dataset and assist in making a holistic evidence-based, data-driven, clinical diagnosis. • To improve the return on investment for their shareholders, a healthcare manufacturer needs to forecast the demand for their product subject to environmental, demographic, economic, and bio-social sentiment data (Big

Data). The organization's data-analytics team is tasked with developing a protocol that identifies, aggregates, harmonizes, models and analyzes these heterogeneous data elements to generate a trend forecast. This system needs to provide an automated, adaptive, scalable, and reliable prediction of the optimal investment, e.g., R&D allocation, that maximizes the company's bottom line. A reader that complete a course of study using this textbook will be able to ingest the observed structured and unstructured data, mathematically represent the data as a computable object, apply appropriate model-based and model-free prediction techniques. The results of these techniques may be used to forecast the expected relation between the company's investment, product supply, general demand of healthcare (providers and patients), and estimate the return on initial investments.

Healthcare Analytics - Hui Yang 2016-08-01

Features of statistical and operational research methods and tools being used to improve the healthcare industry With a focus on cutting-edge approaches to the quickly growing field of healthcare, Healthcare Analytics: From Data to Knowledge to Healthcare Improvement provides an integrated and comprehensive treatment on recent research advancements in data-driven healthcare analytics in an effort to provide more personalized and smarter healthcare services. Emphasizing data and healthcare analytics from an operational management and statistical perspective, the book details how analytical methods and tools can be utilized to enhance healthcare quality and operational efficiency. Organized into two main sections, Part I features biomedical and health informatics and specifically addresses the analytics of genomic and proteomic data; physiological signals from patient-monitoring systems;

data uncertainty in clinical laboratory tests; predictive modeling; disease modeling for sepsis; and the design of cyber infrastructures for early prediction of epidemic events. Part II focuses on healthcare delivery systems, including system advances for transforming clinic workflow and patient care; macro analysis of patient flow distribution; intensive care units; primary care; demand and resource allocation; mathematical models for predicting patient readmission and postoperative outcome; physician–patient interactions; insurance claims; and the role of social media in healthcare. Healthcare Analytics: From Data to Knowledge to Healthcare Improvement also features: • Contributions from well-known international experts who shed light on new approaches in this growing area • Discussions on contemporary methods and techniques to address the handling of rich and large-scale healthcare data as well as the overall optimization of healthcare system operations • Numerous real-world examples and case studies that emphasize the vast potential of statistical and operational research tools and techniques to address the big data environment within the healthcare industry • Plentiful applications that showcase analytical methods and tools tailored for successful healthcare systems modeling and improvement The book is an ideal reference for academics and practitioners in operations research, management science, applied mathematics, statistics, business, industrial and systems engineering, healthcare systems, and economics. Healthcare Analytics: From Data to Knowledge to Healthcare Improvement is also appropriate for graduate-level courses typically offered within operations research, industrial engineering, business, and public health departments.

Data Management and Analytics for Medicine and Healthcare - Edmon Begoli

2017-08-26

This book constitutes the thoroughly refereed conference proceedings of the Third International Workshop on Data Management and Analytics for Medicine and Healthcare, DMAH 2017, in Munich, Germany, in September 2017, held in conjunction with the 43rd International Conference on Very Large Data Bases, VLDB 2017. The 9 revised full papers presented together with 2 keynote abstracts were carefully reviewed and selected from 16 initial submissions. The papers are organized in topical sections on data privacy and trustability for electronic health records; biomedical data management and Integration; online mining of Health related data; and clinical data analytics.

Statistics & Data Analytics for Health Data Management - Nadinia Davis 2015-12-04

Introducing Statistics & Data Analytics for Health Data Management by Nadinia Davis and Betsy Shiland, an engaging new text that emphasizes the easy-to-learn, practical use of statistics and manipulation of data in the health care setting. With its unique hands-on approach and friendly writing style, this vivid text uses real-world examples to show you how to identify the problem, find the right data, generate the statistics, and present the information to other users. Brief Case scenarios ask you to apply information to situations Health Information Management professionals encounter every day, and review questions are tied to learning objectives and Bloom's taxonomy to reinforce core content. From planning budgets to explaining accounting methodologies, Statistics & Data Analytics addresses the key HIM Associate Degree-Entry Level competencies required by CAHIIM and covered in the RHIT exam. Meets key HIM Associate Degree-Entry Level competencies, as required by CAHIIM and covered on the RHIT registry exam, so you get the most accurate and timely

content, plus in-depth knowledge of statistics as used on the job. Friendly, engaging writing style offers a student-centered approach to the often daunting subject of statistics. Four-color design with ample visuals makes this the only textbook of its kind to approach bland statistical concepts and unfamiliar health care settings with vivid illustrations and photos. Math review chapter brings you up-to-speed on the math skills you need to complete the text. Brief Case scenarios strengthen the text's hands-on, practical approach by taking the information presented and asking you to apply it to situations HIM professionals encounter every day. Takeaway boxes highlight key points and important concepts. Math Review boxes remind you of basic arithmetic, often while providing additional practice. Stat Tip boxes explain trickier calculations, often with Excel formulas, and warn of pitfalls in tabulation. Review questions are tied to learning objectives and Bloom's taxonomy to reinforce core content and let you check your understanding of all aspects of a topic. Integrated exercises give you time to pause, reflect, and retain what you have learned. Answers to integrated exercises, Brief Case scenarios, and review questions in the back of the book offer an opportunity for self-study. Appendix of commonly used formulas provides easy reference to every formula used in the textbook. A comprehensive glossary gives you one central location to look up the meaning of new terminology. Instructor resources include TEACH lesson plans, PowerPoint slides, classroom handouts, and a 500-question Test Bank in ExamView that help prepare instructors for classroom lectures.

Analytics in Healthcare and the Life Sciences - Dwight McNeill 2014

Make healthcare analytics work: leverage its powerful opportunities for improving outcomes, cost, and efficiency.This book gives you

thepractical frameworks, strategies, tactics, and case studies you need to go beyond talk to action. The contributing healthcare analytics innovators survey the field's current state, present start-to-finish guidance for planning and implementation, and help decision-makers prepare for tomorrow's advances. They present in-depth case studies revealing how leading organizations have organized and executed analytic strategies that work, and fully cover the primary applications of analytics in all three sectors of the healthcare ecosystem: Provider, Payer, and Life Sciences. Co-published with the International Institute for Analytics (IIA), this book features the combined expertise of IIA's team of leading health analytics practitioners and researchers. Each chapter is written by a member of the IIA faculty, and bridges the latest research findings with proven best practices. This book will be valuable to professionals and decision-makers throughout the healthcare ecosystem, including provider organization clinicians and managers; life sciences researchers and practitioners; and informaticists, actuaries, and managers at payer organizations. It will also be valuable in diverse analytics, operations, and IT courses in business, engineering, and healthcare certificate programs.

Data Science for Healthcare - Sergio Consoli 2019-02-23

This book seeks to promote the exploitation of data science in healthcare systems. The focus is on advancing the automated analytical methods used to extract new knowledge from data for healthcare applications. To do so, the book draws on several interrelated disciplines, including machine learning, big data analytics, statistics, pattern recognition, computer vision, and Semantic Web technologies, and focuses on their direct application to healthcare. Building on three tutorial-like chapters on data science in healthcare, the following eleven chapters

highlight success stories on the application of data science in healthcare, where data science and artificial intelligence technologies have proven to be very promising. This book is primarily intended for data scientists involved in the healthcare or medical sector. By reading this book, they will gain essential insights into the modern data science technologies needed to advance innovation for both healthcare businesses and patients. A basic grasp of data science is recommended in order to fully benefit from this book.

Handbook on Intelligent Healthcare Analytics - A. Jaya 2022-05-09

HANDBOOK OF INTELLIGENT HEALTHCARE ANALYTICS The book explores the various recent tools and techniques used for deriving knowledge from healthcare data analytics for researchers and practitioners. The power of healthcare data analytics is being increasingly used in the industry. Advanced analytics techniques are used against large data sets to uncover hidden patterns, unknown correlations, market trends, customer preferences, and other useful information. A Handbook on Intelligent Healthcare Analytics covers both the theory and application of the tools, techniques, and algorithms for use in big data in healthcare and clinical research. It provides the most recent research findings to derive knowledge using big data analytics, which helps to analyze huge amounts of real-time healthcare data, the analysis of which can provide further insights in terms of procedural, technical, medical, and other types of improvements in healthcare. In addition, the reader will find in this Handbook: Innovative hybrid machine learning and deep learning techniques applied in various healthcare data sets, as well as various kinds of machine learning algorithms existing such as supervised, unsupervised, semi-supervised, reinforcement learning, and guides how readers can implement the

Python environment for machine learning; An exploration of predictive analytics in healthcare; The various challenges for smart healthcare, including privacy, confidentiality, authenticity, loss of information, attacks, etc., that create a new burden for providers to maintain compliance with healthcare data security. In addition, this book also explores various sources of personalized healthcare data and the commercial platforms for healthcare data analytics. Audience Healthcare professionals, researchers, and practitioners who wish to figure out the core concepts of smart healthcare applications and the innovative methods and technologies used in healthcare will all benefit from this book.

Big Data Analytics and Intelligence - Poonam Tanwar 2020-09-30

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.

Data-Driven Healthcare - Laura B. Madsen 2014-09-23

Healthcare is changing, and data is the catalyst Data is taking over in a powerful way, and it's revolutionizingthe healthcare industry. You have more data available than everbefore, and applying the right analytics can spur growth. Benefitsextend to patients, providers, and board members, and thetechnology can make centralized patient management a reality.Despite the potential for growth, many in the industry andgovernment are questioning the value of data in health care,wondering if it's worth the investment. Data-Driven Healthcare: How Analytics and BI are Transformingthe Industry tackles the issue and proves why BI is not onlyworth it, but necessary for industry advancement. Healthcare BIguru Laura Madsen challenges the notion that data have little valuein healthcare, and shows how BI can ease

regulatory reportingpressures and streamline the entire system as it evolves. Madsenillustrates how a data-driven organization is created, and how itcan transform the industry. Learn why BI is a boon to providers Create powerful infographics to communicate data moreeffectively Find out how Big Data has transformed other industries, and howit applies to healthcare Data-Driven Healthcare: How Analytics and BI are Transformingthe Industry provides tables, checklists, and forms that allowyou to take immediate action in implementing BI in yourorganization. You can't afford to be behind the curve. The industryis moving on, with or without you. Data-Driven Healthcare: HowAnalytics and BI are Transforming the Industry is your guide toutilizing data to advance your operation in an industry wheredata-fueled growth will be the new norm.

Big Data and Health Analytics - Katherine Marconi 2014-12-20

Data availability is surpassing existing paradigms for governing, managing, analyzing, and interpreting health data. Big Data and Health Analytics provides frameworks, use cases, and examples that illustrate the role of big data and analytics in modern health care, including how public health information can inform health delivery. Written for health care professionals and executives, this is not a technical book on the use of statistics and machine-learning algorithms for extracting knowledge out of data, nor a book on the intricacies of database design. Instead, this book presents the current thinking of academic and industry researchers and leaders from around the world. Using non-technical language, this book is accessible to health care professionals who might not have an IT and analytics background. It includes case studies that illustrate the business processes underlying the use of big data and health analytics to improve health care delivery. Highlighting lessons learned from the case

studies, the book supplies readers with the foundation required for further specialized study in health analytics and data management. Coverage includes community health information, information visualization which offers interactive environments and analytic processes that support exploration of EHR data, the governance structure required to enable data analytics and use, federal regulations and the constraints they place on analytics, and information security. Links to websites, videos, articles, and other online content that expand and support the primary learning objectives for each major section of the book are also included to help you develop the skills you will need to achieve quality improvements in health care delivery through the effective use of data and analytics.

Knowledge Modelling and Big Data Analytics in Healthcare - Mayuri Mehta 2021-12-09

Knowledge Modelling and Big Data Analytics in Healthcare: Advances and Applications focuses on automated analytical techniques for healthcare applications used to extract knowledge from a vast amount of data. It brings together a variety of different aspects of the healthcare system and aids in the decision-making processes for healthcare professionals. The editors connect four contemporary areas of research rarely brought together in one book: artificial intelligence, big data analytics, knowledge modelling, and healthcare. They present state-of-the-art research from the healthcare sector, including research on medical imaging, healthcare analysis, and the applications of artificial intelligence in drug discovery. This book is intended for data scientists, academicians, and industry professionals in the healthcare sector.

Healthcare Analytics - Ross M. Mullner 2019-09-09

This is a comprehensive, practical guide which looks at the advantages and limitations of new data analysis

techniques being introduced across public health and administration services. The Affordable Care Act (ACT) and free market reforms in healthcare are generating a rapid change of pace. The "electronification" of medical records from paper to digital, which is required to meet the meaningful use standards set forth by the Act, is advancing what and how information can be analyzed. Coupled with the advent of more computing power and big data analytics and techniques, practitioners now more than ever need to stay on top of these trends. This book presents a comprehensive look at healthcare analytics from population data to geospatial analysis using current case studies and data analysis examples in health. This resource will appeal to undergraduate and graduate students in health administration and public health. It will benefit healthcare professionals and administrators within nursing, public health, and medical students who are interested in the future of data within healthcare. d administrators within nursing, public health, and medical students who are interested in the future of data within healthcare.

Healthcare Business Intelligence, + Website - Laura Madsen 2012-09-04 Solid business intelligence guidance uniquely designed for healthcare organizations Increasing regulatory pressures on healthcare organizations have created a national conversation on data, reporting and analytics in healthcare. Behind the scenes, business intelligence (BI) and data warehousing (DW) capabilities are key drivers that empower these functions. Healthcare Business Intelligence is designed as a guidebook for healthcare organizations dipping their toes into the areas of business intelligence and data warehousing. This volume is essential in how a BI capability can ease the increasing regulatory reporting pressures on all healthcare organizations.

Explores the five tenets of healthcare business intelligence Offers tips for creating a BI team Identifies what healthcare organizations should focus on first Shows you how to gain support for your BI program Provides tools and techniques that will jump start your BI Program Explains how to market and maintain your BI Program The risk associated with doing BI/DW wrong is high, and failures are well documented. Healthcare Business Intelligence helps you get it right, with expert guidance on getting your BI program started and successfully keep it going.

Handbook on Intelligent Healthcare Analytics - A. Jaya 2022-06-01

HANDBOOK OF INTELLIGENT HEALTHCARE ANALYTICS The book explores the various recent tools and techniques used for deriving knowledge from healthcare data analytics for researchers and practitioners. The power of healthcare data analytics is being increasingly used in the industry. Advanced analytics techniques are used against large data sets to uncover hidden patterns, unknown correlations, market trends, customer preferences, and other useful information. A Handbook on Intelligent Healthcare Analytics covers both the theory and application of the tools, techniques, and algorithms for use in big data in healthcare and clinical research. It provides the most recent research findings to derive knowledge using big data analytics, which helps to analyze huge amounts of real-time healthcare data, the analysis of which can provide further insights in terms of procedural, technical, medical, and other types of improvements in healthcare. In addition, the reader will find in this Handbook: Innovative hybrid machine learning and deep learning techniques applied in various healthcare data sets, as well as various kinds of machine learning algorithms existing such as supervised, unsupervised, semi-supervised, reinforcement learning, and guides how

readers can implement the Python environment for machine learning; An exploration of predictive analytics in healthcare; The various challenges for smart healthcare, including privacy, confidentiality, authenticity, loss of information, attacks, etc., that create a new burden for providers to maintain compliance with healthcare data security. In addition, this book also explores various sources of personalized healthcare data and the commercial platforms for healthcare data analytics. Audience Healthcare professionals, researchers, and practitioners who wish to figure out the core concepts of smart healthcare applications and the innovative methods and technologies used in healthcare will all benefit from this book.

Information Quality - Ron S. Kenett 2016-10-13

Provides an important framework for data analysts in assessing the quality of data and its potential to provide meaningful insights through analysis Analytics and statistical analysis have become pervasive topics, mainly due to the growing availability of data and analytic tools. Technology, however, fails to deliver insights with added value if the quality of the information it generates is not assured. Information Quality (InfoQ) is a tool developed by the authors to assess the potential of a dataset to achieve a goal of interest, using data analysis. Whether the information quality of a dataset is sufficient is of practical importance at many stages of the data analytics journey, from the pre-data collection stage to the post-data collection and post-analysis stages. It is also critical to various stakeholders: data collection agencies, analysts, data scientists, and management. This book: Explains how to integrate the notions of goal, data, analysis and utility that are the main building blocks of data analysis within any domain. Presents a framework for integrating domain knowledge with data

analysis. Provides a combination of both methodological and practical aspects of data analysis. Discusses issues surrounding the implementation and integration of InfoQ in both academic programmes and business / industrial projects. Showcases numerous case studies in a variety of application areas such as education, healthcare, official statistics, risk management and marketing surveys. Presents a review of software tools from the InfoQ perspective along with example datasets on an accompanying website. This book will be beneficial for researchers in academia and in industry, analysts, consultants, and agencies that collect and analyse data as well as undergraduate and postgraduate courses involving data analysis.

Healthcare Data Analytics - Chandan K. Reddy 2020-06-30
Supplying a comprehensive overview of healthcare analytics research, Healthcare Data Analytics provides an understanding of the analytical techniques currently available to solve healthcare problems. The book details novel techniques for acquiring, handling, retrieving, and making best use of healthcare data. It analyzes recent devel

Health Informatics Vision: From Data via Information to Knowledge - J. Mantas 2019-08-06
The latest developments in data, informatics and technology continue to enable health professionals and informaticians to improve healthcare for the benefit of patients everywhere. This book presents full papers from ICIMTH 2019, the 17th International Conference on Informatics, Management and Technology in Healthcare, held in Athens, Greece from 5 to 7 July 2019. Of the 150 submissions received, 95 were selected for presentation at the conference following review and are included here. The conference focused on increasing and improving knowledge of healthcare applications spanning the

entire spectrum from clinical and health informatics to public health informatics as applied in the healthcare domain. The field of biomedical and health informatics is examined in a very broad framework, presenting the research and application outcomes of informatics from cell to population and exploring a number of technologies such as imaging, sensors, and biomedical equipment, together with management and organizational aspects including legal and social issues. Setting research priorities in health informatics is also addressed. Providing an overview of the latest developments in health informatics, the book will be of interest to all those working in the field.

Handbook of Healthcare Analytics - Tinglong Dai 2018-07-30

How can analytics scholars and healthcare professionals access the most exciting and important healthcare topics and tools for the 21st century? Editors Tinglong Dai and Sridhar Tayur, aided by a team of internationally acclaimed experts, have curated this timely volume to help newcomers and seasoned researchers alike to rapidly comprehend a diverse set of thrusts and tools in this rapidly growing cross-disciplinary field. The Handbook covers a wide range of macro-, meso- and micro-level thrusts—such as market design, competing interests, global health, personalized medicine, residential care and concierge medicine, among others—and structures what has been a highly fragmented research area into a coherent scientific discipline. The handbook also provides an easy-to-comprehend introduction to five essential research tools—Markov decision process, game theory and information economics, queueing games, econometric methods, and data science—by illustrating their uses and applicability on examples from diverse healthcare settings, thus connecting tools with thrusts. The primary audience

of the Handbook includes analytics scholars interested in healthcare and healthcare practitioners interested in analytics. This Handbook: Instills analytics scholars with a way of thinking that incorporates behavioral, incentive, and policy considerations in various healthcare settings. This change in perspective—a shift in gaze away from narrow, local and one-off operational improvement efforts that do not replicate, scale or remain sustainable—can lead to new knowledge and innovative solutions that healthcare has been seeking so desperately. Facilitates collaboration between healthcare experts and analytics scholar to frame and tackle their pressing concerns through appropriate modern mathematical tools designed for this very purpose. The handbook is designed to be accessible to the independent reader, and it may be used in a variety of settings, from a short lecture series on specific topics to a semester-long course.

Leveraging Biomedical and Healthcare Data - Firas Kobeissy 2018-11-23

Leveraging Biomedical and Healthcare Data: Semantics, Analytics and Knowledge provides an overview of the approaches used in semantic systems biology, introduces novel areas of its application, and describes step-wise protocols for transforming heterogeneous data into useful knowledge that can influence healthcare and biomedical research. Given the astronomical increase in the number of published reports, papers, and datasets over the last few decades, the ability to curate this data has become a new field of biomedical and healthcare research. This book discusses big data text-based mining to better understand the molecular architecture of diseases and to guide health care decision. It will be a valuable resource for bioinformaticians and members of several areas of the biomedical field who are interested in understanding more about how to process and apply great amounts of data to

improve their research. Includes at each section resource pages containing a list of available curated raw and processed data that can be used by researchers in the field Provides demonstrative and relevant examples that serve as a general tutorial Presents a list of algorithm names and computational tools available for basic and clinical researchers

New Horizons for a Data-Driven Economy - José María Cavanillas 2016-04-04

In this book readers will find technological discussions on the existing and emerging technologies across the different stages of the big data value chain. They will learn about legal aspects of big data, the social impact, and about education needs and requirements. And they will discover the business perspective and how big data technology can be exploited to deliver value within different sectors of the economy. The book is structured in four parts: Part I "The Big Data Opportunity" explores the value potential of big data with a particular focus on the European context. It also describes the legal, business and social dimensions that need to be addressed, and briefly introduces the European Commission's BIG project. Part II "The Big Data Value Chain" details the complete big data lifecycle from a technical point of view, ranging from data acquisition, analysis, curation and storage, to data usage and exploitation. Next, Part III "Usage and Exploitation of Big Data" illustrates the value creation possibilities of big data applications in various sectors, including industry, healthcare, finance, energy, media and public services. Finally, Part IV "A Roadmap for Big Data Research" identifies and prioritizes the cross-sectorial requirements for big data research, and outlines the most urgent and challenging technological, economic, political and societal issues for big data in Europe. This compendium summarizes more than two years of work

performed by a leading group of major European research centers and industries in the context of the BIG project. It brings together research findings, forecasts and estimates related to this challenging technological context that is becoming the major axis of the new digitally transformed business environment.

Data Analytics in Medicine: Concepts, Methodologies, Tools, and Applications - Management Association, Information Resources 2019-12-06

Advancements in data science have created opportunities to sort, manage, and analyze large amounts of data more effectively and efficiently. Applying these new technologies to the healthcare industry, which has vast quantities of patient and medical data and is increasingly becoming more data-reliant, is crucial for refining medical practices and patient care. Data Analytics in Medicine: Concepts, Methodologies, Tools, and Applications is a vital reference source that examines practical applications of healthcare analytics for improved patient care, resource allocation, and medical performance, as well as for diagnosing, predicting, and identifying at-risk populations. Highlighting a range of topics such as data security and privacy, health informatics, and predictive analytics, this multi-volume book is ideally designed for doctors, hospital administrators, nurses, medical professionals, IT specialists, computer engineers, information technologists, biomedical engineers, data-processing specialists, healthcare practitioners, academicians, and researchers interested in current research on the connections between data analytics in the field of medicine.

Analytics in Healthcare - Christo El Morr 2019-01-21

This book offers a practical introduction to healthcare analytics that does not require a background in data science or statistics. It presents the

basics of data, analytics and tools and includes multiple examples of their applications in the field. The book also identifies practical challenges that fuel the need for analytics in healthcare as well as the solutions to address these problems. In the healthcare field, professionals have access to vast amount of data in the form of staff records, electronic patient record, clinical findings, diagnosis, prescription drug, medical imaging procedure, mobile health, resources available, etc. Managing the data and analyzing it to properly understand it and use it to make well-informed decisions can be a challenge for managers and health care professionals. A new generation of applications, sometimes referred to as end-user analytics or self-serve analytics, are specifically designed for non-technical users such as managers and business professionals. The ability to use these increasingly accessible tools with the abundant data requires a basic understanding of the core concepts of data, analytics, and interpretation of outcomes. This book is a resource for such individuals to demystify and learn the basics of data management and analytics for healthcare, while also looking towards future directions in the field.

Healthcare Analytics Made Simple - Vikas (Vik) Kumar 2018-07-31

Add a touch of data analytics to your healthcare systems and get insightful outcomes Key Features Perform healthcare analytics with Python and SQL Build predictive models on real healthcare data with pandas and scikit-learn Use analytics to improve healthcare performance Book Description In recent years, machine learning technologies and analytics have been widely utilized across the healthcare sector. Healthcare Analytics Made Simple bridges the gap between practising doctors and data scientists. It equips the data scientists' work with healthcare data and allows them to gain better insight

from this data in order to improve healthcare outcomes. This book is a complete overview of machine learning for healthcare analytics, briefly describing the current healthcare landscape, machine learning algorithms, and Python and SQL programming languages. The step-by-step instructions teach you how to obtain real healthcare data and perform descriptive, predictive, and prescriptive analytics using popular Python packages such as pandas and scikit-learn. The latest research results in disease detection and healthcare image analysis are reviewed. By the end of this book, you will understand how to use Python for healthcare data analysis, how to import, collect, clean, and refine data from electronic health record (EHR) surveys, and how to make predictive models with this data through real-world algorithms and code examples. What you will learn Gain valuable insight into healthcare incentives, finances, and legislation Discover the connection between machine learning and healthcare processes Use SQL and Python to analyze data Measure healthcare quality and provider performance Identify features and attributes to build successful healthcare models Build predictive models using real-world healthcare data Become an expert in predictive modeling with structured clinical data See what lies ahead for healthcare analytics Who this book is for Healthcare Analytics Made Simple is for you if you are a developer who has a working knowledge of Python or a related programming language, although you are new to healthcare or predictive modeling with healthcare data. Clinicians interested in analytics and healthcare computing will also benefit from this book. This book can also serve as a textbook for students enrolled in an introductory course on machine learning for healthcare.

Health Analytics - Jason Burke 2013-06-18

A hands-on, analytics road map

for health industry leaders The industry-wide transformation taking place across the health and life sciences ecosystem is mandating that organizations adopt new decision-making capabilities, based on science and real-world information. Analytics will be a required competency for the modern health enterprise; this book is about how to "cross the chasm." The ultimate analytics guide for the health industry leader, this essential book equips business leaders with little-to-no experience in analytics to understand how to incorporate analytics as a cornerstone of their 21st century competitive business strategy. Paints the picture for a new health enterprise, one focused on the patient Explores the financial components of this new operating model, using analytics to optimize the tradeoffs between cost and value Deals with the rising role of the consumer, using analytics to create a completely new health engagement model with individual recipients of care Looks at how analytics can drive innovations in care practice, patient-experienced medical outcomes, and analytically driven novel therapies optimized for the individual patient Presents a variety of text, tables, and graphics illustrating the various concepts being described Within each section and chapter, Health Analytics assesses the current landscape, proposing a new model/concept, sharing real-world stories of how the old and new world come together, and framing a "how-to" for the reader in terms of growing that particular set of capabilities in their own enterprises.

Healthcare Analytics for Quality and Performance Improvement - Trevor L. Strome 2013-10-07

Improve patient outcomes, lower costs, reduce fraud—all with healthcare analytics Healthcare Analytics for Quality and Performance Improvement walks your healthcare organization from relying on generic reports and dashboards to developing powerful analytic applications

that drive effective decision-making throughout your organization. Renowned healthcare analytics leader Trevor Strome reveals in this groundbreaking volume the true potential of analytics to harness the vast amounts of data being generated in order to improve the decision-making ability of healthcare managers and improvement teams. Examines how technology has impacted healthcare delivery Discusses the challenge facing healthcare organizations: to leverage advances in both clinical and information technology to improve quality and performance while containing costs Explores the tools and techniques to analyze and extract value from healthcare data Demonstrates how the clinical, business, and technology components of healthcare organizations (HCOs) must work together to leverage analytics Other industries are already taking advantage of big data. Healthcare Analytics for Quality and Performance Improvement helps the healthcare industry make the most of the precious data already at its fingertips for long-overdue quality and performance improvement.

Green Computing and Predictive Analytics for Healthcare - Sourav Banerjee 2020-12-10

Green Computing and Predictive Analytics for Healthcare excavates the rudimentary concepts of Green Computing, Big Data and the Internet of Things along with the latest research development in the domain of healthcare. It also covers various applications and case studies in the field of computer science with state-of-the-art tools and technologies. The rapid growth of the population is a challenging issue in maintaining and monitoring various experiences of quality of service in healthcare. The coherent usage of these limited resources in connection with optimum energy consumption has been becoming more important. The major healthcare nodes are gradually becoming Internet of Things-

enabled, and sensors, work data and the involvement of networking are creating smart campuses and smart houses. The book includes chapters on the Internet of Things and Big Data technologies. Features: Biomedical data monitoring under the Internet of Things Environment data sensing and analyzing Big data analytics and clustering Machine learning techniques for sudden cardiac death prediction Robust brain tissue segmentation Energy-efficient and green Internet of Things for healthcare applications Blockchain technology for the healthcare Internet of Things Advanced healthcare for domestic medical tourism system Edge computing for data analytics This book on Green Computing and Predictive Analytics for Healthcare aims to promote and facilitate the exchange of research knowledge and findings across different disciplines on the design and investigation of healthcare data analytics. It can also be used as a textbook for a master's course in biomedical engineering. This book will also present new methods for medical data evaluation and the diagnosis of different diseases to improve quality-of-life in general and for better integration of Internet of Things into society. Dr. Sourav Banerjee is an Assistant Professor at the Department of Computer Science and Engineering of Kalyani Government Engineering College, Kalyani, West Bengal, India. His research interests include Big Data, Cloud Computing, Distributed Computing and Mobile Communications. Dr. Chinmay Chakraborty is an Assistant Professor at the Department of Electronics and Communication Engineering, Birla Institute of Technology, Mesra, India. His main research interests include the Internet of Medical Things, WBAN, Wireless Networks, Telemedicine, m-Health/e-Health and Medical Imaging. Dr. Kousik Dasgupta is an Assistant Professor at the Department of Computer

Science and Engineering, Kalyani Government Engineering College, India. His research interests include Computer Vision, AI/ML, Cloud Computing, Big Data and Security.

AI and Machine Learning Paradigms for Health Monitoring System - Hasmat Malik 2021-02-14

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.

Internet of Things and Big Data Technologies for Next Generation Healthcare - Chintan Bhatt 2017-01-01

This comprehensive book focuses on better big-data security for healthcare organizations. Following an extensive introduction to the Internet of Things (IoT) in healthcare including challenging topics and scenarios, it offers an in-depth analysis of medical body area networks with the 5th generation of IoT communication technology along with its nanotechnology. It also describes a novel strategic framework and computationally intelligent model to measure possible

security vulnerabilities in the context of e-health. Moreover, the book addresses healthcare systems that handle large volumes of data driven by patients' records and health/personal information, including big-data-based knowledge management systems to support clinical decisions. Several of the issues faced in storing/processing big data are presented along with the available tools, technologies and algorithms to deal with those problems as well as a case study in healthcare analytics. Addressing trust, privacy, and security issues as well as the IoT and big-data challenges, the book highlights the advances in the field to guide engineers developing different IoT devices and evaluating the performance of different IoT techniques. Additionally, it explores the impact of such technologies on public, private, community, and hybrid scenarios in healthcare. This book offers professionals, scientists and engineers the latest technologies, techniques, and strategies for IoT and big data.

Big Data Analytics in Bioinformatics and Healthcare - Wang, Baoying 2014-10-31

As technology evolves and electronic data becomes more complex, digital medical record management and analysis becomes a challenge. In order to discover patterns and make relevant predictions based on large data sets, researchers and medical professionals must find new methods to analyze and extract relevant health information. Big Data Analytics in Bioinformatics and Healthcare merges the fields of biology, technology, and medicine in order to present a comprehensive study on the emerging information processing applications necessary in the field of electronic medical record management. Complete with interdisciplinary research resources, this publication is an essential reference source for researchers, practitioners, and students interested in the fields of biological computation, database

management, and health information technology, with a special focus on the methodologies and tools to manage massive and complex electronic information.

Healthcare Business Intelligence - Laura Madsen 2012-07-20

Solid business intelligence guidance uniquely designed for healthcare organizations Increasing regulatory pressures on healthcare organizations have created a national conversation on data, reporting and analytics in healthcare. Behind the scenes, business intelligence (BI) and data warehousing (DW) capabilities are key drivers that empower these functions. Healthcare Business Intelligence is designed as a guidebook for healthcare organizations dipping their toes into the areas of business intelligence and data warehousing. This volume is essential in how a BI capability can ease the increasing regulatory reporting pressures on all healthcare organizations. Explores the five tenets of healthcare business intelligence Offers tips for creating a BI team Identifies what healthcare organizations should focus on first Shows you how to gain support for your BI program Provides tools and techniques that will jump start your BI Program Explains how to market and maintain your BI Program The risk associated with doing BI/DW wrong is high, and failures are well documented. Healthcare Business Intelligence helps you get it right, with expert guidance on getting your BI program started and successfully keep it going.

Big Data and Health Analytics - Katherine Marconi 2014-12-20

Data availability is surpassing existing paradigms for governing, managing, analyzing, and interpreting health data. Big Data and Health Analytics provides frameworks, use cases, and examples that illustrate the role of big data and analytics in modern health care, including how public health information can inform health delivery.Written for healt

Healthcare Analytics - Hui Yang 2016-10-10
Features of statistical and operational research methods and tools being used to improve the healthcare industry With a focus on cutting-edge approaches to the quickly growing field of healthcare, Healthcare Analytics: From Data to Knowledge to Healthcare Improvement provides an integrated and comprehensive treatment on recent research advancements in data-driven healthcare analytics in an effort to provide more personalized and smarter healthcare services. Emphasizing data and healthcare analytics from an operational management and statistical perspective, the book details how analytical methods and tools can be utilized to enhance healthcare quality and operational efficiency. Organized into two main sections, Part I features biomedical and health informatics and specifically addresses the analytics of genomic and proteomic data; physiological signals from patient-monitoring systems; data uncertainty in clinical laboratory tests; predictive modeling; disease modeling for sepsis; and the design of cyber infrastructures for early prediction of epidemic events. Part II focuses on healthcare delivery systems, including system advances for transforming clinic workflow and patient care; macro analysis of patient flow distribution; intensive care units; primary care; demand and resource allocation; mathematical models for predicting patient readmission and postoperative outcome; physician–patient interactions; insurance claims; and the role of social media in healthcare. Healthcare Analytics: From Data to Knowledge to Healthcare Improvement also features: • Contributions from well-known international experts who shed light on new approaches in this growing area • Discussions on contemporary methods and techniques to address the handling of rich and large-scale

healthcare data as well as the overall optimization of healthcare system operations • Numerous real-world examples and case studies that emphasize the vast potential of statistical and operational research tools and techniques to address the big data environment within the healthcare industry • Plentiful applications that showcase analytical methods and tools tailored for successful healthcare systems modeling and improvement The book is an ideal reference for academics and practitioners in operations research, management science, applied mathematics, statistics, business, industrial and systems engineering, healthcare systems, and economics. Healthcare Analytics: From Data to Knowledge to Healthcare Improvement is also appropriate for graduate-level courses typically offered within operations research, industrial engineering, business, and public health departments.

Data Analytics in Biomedical Engineering and Healthcare - Kun Chang Lee 2020-10-18

Data Analytics in Biomedical Engineering and Healthcare explores key applications using data analytics, machine learning, and deep learning in health sciences and biomedical data. The book is useful for those working with big data analytics in biomedical research, medical industries, and medical research scientists. The book covers health analytics, data science, and machine and deep learning applications for biomedical data, covering areas such as predictive health analysis, electronic health records, medical image analysis, computational drug discovery, and genome structure prediction using predictive modeling. Case studies demonstrate big data applications in healthcare using the MapReduce and Hadoop frameworks. Examines the development and application of data analytics applications in biomedical data Presents innovative classification and regression

models for predicting various diseases Discusses genome structure prediction using predictive modeling Shows readers how to develop clinical decision support systems Shows researchers and specialists how to use hybrid learning for better medical diagnosis, including case studies of healthcare applications using the MapReduce and Hadoop frameworks

Healthcare Analytics for Quality and Performance Improvement - Trevor L. Strome 2013-10-02

Improve patient outcomes, lower costs, reduce fraud—allwith healthcare analytics Healthcare Analytics for Quality and PerformanceImprovement walks your healthcare organization from relying ongeneric reports and dashboards to developing powerful analyticapplications that drive effective decision-making throughout yourorganization. Renowned healthcare analytics leader Trevor Stromereveals in this groundbreaking volume the true potential ofanalytics to harness the vast amounts of data being generated inorder to improve the decision-making ability of healthcare managersand improvement teams. Examines how technology has impacted healthcare delivery Discusses the challenge facing healthcare organizations: toleverage advances in both clinical and information technology toimprove quality and performance while containing costs Explores the tools and techniques to analyze and extract valuefrom healthcare data Demonstrates how the clinical, business, and technologycomponents of healthcare organizations (HCOs) must work together toleverage analytics Other industries are already taking advantage of big data.Healthcare Analytics for Quality and Performance Improvementhelps the healthcare industry make the most of the precious dataalready at its fingertips for long-overdue quality and

performanceimprovement.

Applications of Big Data in Healthcare - Ashish Khanna 2021-03-10

Applications of Big Data in Healthcare: Theory and Practice begins with the basics of Big Data analysis and introduces the tools, processes and procedures associated with Big Data analytics. The book unites healthcare with Big Data analysis and uses the advantages of the latter to solve the problems faced by the former. The authors present the challenges faced by the healthcare industry, including capturing, storing, searching, sharing and analyzing data. This book illustrates the challenges in the applications of Big Data and suggests ways to overcome them, with a primary emphasis on data repositories, challenges, and concepts for data scientists, engineers and clinicians. The applications of Big Data have grown tremendously within the past few years and its growth can not only be attributed to its competence to handle large data streams but also to its abilities to find insights from complex, noisy, heterogeneous, longitudinal and voluminous data. The main objectives of Big Data in the healthcare sector is to come up with ways to provide personalized healthcare to patients by taking into account the enormous amounts of already existing data. Provides case studies that illustrate the business processes underlying the use of big data and deep learning health analytics to improve health care delivery Supplies readers with a foundation for further specialized study in clinical analysis and data management Includes links to websites, videos, articles and other online content to expand and support the primary learning objectives for each major section of the book

Big Data Analytics in Healthcare - Anand J. Kulkarni 2019-10-01

This book includes state-of-the-art discussions on various issues and aspects of the implementation, testing, validation, and application of

big data in the context of healthcare. The concept of big data is revolutionary, both from a technological and societal well-being standpoint. This book provides a comprehensive reference guide for engineers, scientists, and students studying/involved in the development of big data tools in the areas of healthcare and medicine. It also features a multifaceted and state-of-the-art literature review on healthcare data, its modalities, complexities, and methodologies, along with mathematical formulations. The book is divided into two main sections, the first of which discusses the challenges and opportunities associated with the implementation of big data in the healthcare sector. In turn, the second addresses the mathematical modeling of healthcare problems, as well as current and potential future big data applications and platforms.