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Innovation in Medicine and Healthcare 2015
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From Data to Knowledge to Healthcare Improvement
32nd Benelux Conference, BNAIC/Benelearn 2020, Leiden, The Netherlands, November 19–20, 2020, Revised Selected Papers
Visual Analysis of Bayesian Networks for Electronic Health Records
Bayesian Networks for Health Care Support
An Introduction
Bayesian Networks
with Applications in Systems Biology
From Knowledge to Global Care, AIME 2007 Workshop K4CARE 2007, Amsterdam, The Netherlands, July 7, 2007, Revised Selected Papers

HOUSTON AMIR

System Health Diagnosis and Prognosis Using Dynamic Bayesian Networks Artech House
Contains papers which reflect the breadth and depth of the field of biomedical and health informatics, covering topics such as; health information systems, education, standards, consumer health and human factors, emerging technologies, sustainability, organizational and economic issues, genomics, and image and signal processing.
Healthcare Analytics Springer Science & Business Media
Since the first edition of this book published, Bayesian networks have become even more important for applications in a vast array of fields. This second edition includes new material on influence diagrams, learning from data, value of information, cybersecurity, debunking bad statistics, and much more. Focusing on practical real-world problem-solving and model building, as opposed to algorithms and theory, it explains how to incorporate knowledge with data to develop and use (Bayesian) causal models of risk that provide more powerful insights and better decision making than is possible from purely data-driven solutions. Features Provides all tools necessary to build and run realistic Bayesian network models Supplies extensive example models based on real risk assessment problems in a wide range of application domains provided; for example, finance, safety, systems reliability, law, forensics, cybersecurity and more

Introduces all necessary mathematics, probability, and statistics as needed Establishes the basics of probability, risk, and building and using Bayesian network models, before going into the detailed applications A dedicated website contains exercises and worked solutions for all chapters along with numerous other resources. The AgenaRisk software contains a model library with executable versions of all of the models in the book. Lecture slides are freely available to accredited academic teachers adopting the book on their course.

Bayesian Networks for Probabilistic Inference and Decision Analysis in Forensic Science Springer

Public Health is regarded as the basis and cornerstone of health, generally and in medicine. Defined as the science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals, this discipline has been renewed by the incorporation of multiple actors, professions, knowledge areas and it has also been impacted and promoted by multiple technologies, particularly - the information technology. As a changing field of knowledge, Public Health requires evidence-based information and regular updates. Current Topics in Public Health presents updated information on multiple topics related to actual areas of interest in this growing and exciting medical science, with the conception and philosophy that we are working to improve the health of the population, rather than treating diseases of individual patients, taking decisions about collective health care that are based on the best available, current, valid and relevant evidence, and finally within the context of available resources. With participation of authors from multiple countries, many from developed and developing ones, this book offers a wide geographical perspective. Finally, all these characteristics make this book an excellent update on many subjects of world public health.

On Bayesian Networks for Structural Health and Condition Monitoring Springer Science & Business Media

This unique reference focuses on methods of application, validation and testing based on real deployments of sensor networks in the clinical and home environments. Key topics include healthcare and wireless sensors, sensor network applications, designs of experiments using sensors, data collection and decision making, clinical deployment of wireless sensor networks, contextual awareness medication prompting field trials in homes, social health monitoring, and the future of wireless sensor networks in healthcare.

Probabilistic Networks and Expert Systems CRC Press

This is a brand new edition of an essential work on Bayesian networks and decision graphs. It is an introduction to probabilistic graphical models including Bayesian networks and influence diagrams. The reader is guided through the two types of frameworks with examples and exercises, which also give instruction on how to build these models. Structured in two parts, the first section focuses on probabilistic graphical models, while the second part deals with decision graphs, and in addition to the frameworks described in the previous edition, it also introduces Markov decision process and partially ordered decision problems.

Artificial Intelligence and Machine Learning Springer

Worldwide the amount of data generated by the medical

community is staggering, and increasing dramatically. Using this data to improve patient care using analytics and machine learning is a huge and largely untapped opportunity. The most important medical data captured exist in patients' electronic health records (EHRs) which are maintained and utilized by health care providers. EHRs consist of rich and comprehensive patient-specific information from a large number of sources in different formats with heterogeneous data types. There are numerous challenges in attempting to apply existing analytic tools and methodologies to this data. Many features extracted from EHRs have dependent relationships - for example, “flu” and “high body temperature”. Bayesian networks, as one of the few modeling methodologies which capture feature dependence rather than assuming independence, provide a flexible foundation for modeling EHRs. However, existing Bayesian network learning methodologies produce models whose complexity makes them difficult for clinicians to utilize or even interpret. Therefore, better model visualization methodologies, as well as learning methods which produce models more amenable to simplification and summarization, are critical to making them interpretable and useful to clinicians, and therefore to improving patient care.

Public Health Intelligence and the Internet Springer Science & Business Media

This book aims to highlight the latest achievements in epidemiological surveillance and internet interventions based on monitoring online communications and interactions on the web. It presents the state of the art and the advances in the field of online disease surveillance and intervention. The edited volume contains extended and revised versions of selected papers presented at the International World Wide Web and Population Health Intelligence (W3PHI) workshop series along with some invited chapters and presents an overview of the issues, challenges, and potentials in the field, along with the new research results. The book provides information for a wide range of scientists, researchers, graduate students, industry professionals, national and international public health agencies, and NGOs interested in the theory and practice of computational models of web-based public health intelligence.

Current Topics in Public Health Springer Science & Business Media

This book introduces the field of Health Web Science and presents methods for information gathering from written social media data. It explores the availability and utility of the personal medical information shared on social media platforms and determines ways to apply this largely untapped information source to healthcare systems and public health monitoring. Introducing an innovative concept for integrating social media data with clinical data, it addresses the crucial aspect of combining experiential data from social media with clinical evidence, and explores how the variety of available social media content can be analyzed and implemented. The book tackles a range of topics including social media’s role in healthcare, the gathering of shared information, and the integration of clinical and social media data. Application examples of social media for health monitoring, along with its usage in patient treatment are also provided. The book also considers the ethical and legal issues of gathering and utilizing social media data, along with the risks and challenges that must be considered when integrating

social media data into healthcare choices. With an increased interest internationally in E-Health, Health 2.0, Medicine 2.0 and the recent birth of the discipline of Web Science, this book will be a valuable resource for researchers and practitioners investigating this emerging topic.

Learning Bayesian Networks BoD – Books on Demand

Bayesian Networks: An Introduction provides a self-contained introduction to the theory and applications of Bayesian networks, a topic of interest and importance for statisticians, computer scientists and those involved in modelling complex data sets. The material has been extensively tested in classroom teaching and assumes a basic knowledge of probability, statistics and mathematics. All notions are carefully explained and feature exercises throughout. Features include: An introduction to Dirichlet Distribution, Exponential Families and their applications. A detailed description of learning algorithms and Conditional Gaussian Distributions using Junction Tree methods. A discussion of Pearl's intervention calculus, with an introduction to the notion of see and do conditioning. All concepts are clearly defined and illustrated with examples and exercises. Solutions are provided online. This book will prove a valuable resource for postgraduate students of statistics, computer engineering, mathematics, data mining, artificial intelligence, and biology. Researchers and users of comparable modelling or statistical techniques such as neural networks will also find this book of interest.

Comparing Bayesian Networks and Naive Bayes Classifiers in the Analysis of Access and Use of Health Care Services Springer Nature

Innovation in medicine and healthcare is an interdisciplinary research area, which combines the advanced technologies and problem solving skills with medical and biological science. A central theme of this proceedings is Smart Medical and Healthcare Systems (modern intelligent systems for medicine and healthcare), which can provide efficient and accurate solution to problems faced by healthcare and medical practitioners today by using advanced information communication techniques, computational intelligence, mathematics, robotics and other advanced technologies. The techniques developed in this area will have a significant effect on future medicine and healthcare. The volume includes 53 papers, which present the recent trend and innovations in medicine and healthcare including Medical Informatics; Biomedical Engineering; Management for Healthcare; Advanced ICT for Medical and Healthcare; Simulation and Visualization/VR for Medicine; Statistical Signal Processing and Artificial Intelligence; Smart Medical and Healthcare System and Healthcare Support System.

Wireless Sensor Networks for Healthcare Applications CRC Press

Comparing Bayesian Networks and Naive Bayes Classifiers in the Analysis of Access and Use of Health Care ServicesBayesian NetworksWith Examples in RCRC Press

With Examples in R Springer

Aims and Scope Patients are more empowered to shape their own health care today than ever before. Health information technologies are creating new opportunities for patients and families to participate actively in their care, manage their medical problems and improve communication with their healthcare providers. Moreover, health information technologies are

enabling healthcare providers to partner with their patients in a bold effort to optimize quality of care, improve health outcomes and transform the healthcare system on the macro-level. In this book, leading figures discuss the existing needs, challenges and opportunities for improving patient engagement and empowerment through health information technology, mapping out what has been accomplished and what work remains to truly transform the care we deliver and engage patients in their care. Policymakers, healthcare providers and administrators, consultants and industry managers, researchers and students and, not least, patients and their family members should all find value in this book. "In the exciting period that lies just ahead, more will be needed than simply connecting patients to clinicians, and clinicians to each other. The health care systems that will be most effective in meeting patients' needs will be those that can actually design their 'human wares' around that purpose. This book provides deep insight into how information technology can and will support that redesign." Thomas H. Lee, MD, MSc, Chief Medical Officer, Press Ganey Associates; Professor of Medicine, Harvard Medical School and Professor of Health Policy and Management, Harvard School of Public Health The Editors: Drs. Maria Adela Grando, Ronen Rozenblum and David W. Bates are widely recognized professors, researchers and experts in the domain of health information technology, patient engagement and empowerment. Their research, lectures and contributions in these domains have been recognized nationally and internationally. Dr. Grando is affiliated with Arizona State University and the Mayo Clinic, and Drs. Rozenblum and Bates are affiliated with Brigham and Women's Hospital and Harvard University.

Modern Bayesian Statistics in Clinical Research IOS Press

Bayesian Networks “This book should have a place on the bookshelf of every forensic scientist who cares about the science of evidence interpretation.” Dr. Ian Evett, Principal Forensic Services Ltd, London, UK Bayesian Networks for Probabilistic Inference and Decision Analysis in Forensic Science Second Edition Continuing developments in science and technology mean that the amounts of information forensic scientists are able to provide for criminal investigations is ever increasing. The commensurate increase in complexity creates diffculties for scientists and lawyers with regard to evaluation and interpretation, notably with respect to issues of inference and decision. Probability theory, implemented through graphical methods, and specifically Bayesian networks, provides powerful methods to deal with this complexity. Extensions of these methods to elements of decision theory provide further support and assistance to the judicial system. Bayesian Networks for Probabilistic Inference and Decision Analysis in Forensic Science provides a unique and comprehensive introduction to the use of Bayesian decision networks for the evaluation and interpretation of scientific findings in forensic science, and for the support of decision-makers in their scientific and legal tasks. Includes self-contained introductions to probability and decision theory. Develops the characteristics of Bayesian networks, object-oriented Bayesian networks and their extension to decision models. Features implementation of the methodology with reference to commercial and academically available software. Presents standard networks and their extensions that can be

easily implemented and that can assist in the reader's own analysis of real cases. Provides a technique for structuring problems and organizing data based on methods and principles of scientific reasoning. Contains a method for the construction of coherent and defensible arguments for the analysis and evaluation of scientific findings and for decisions based on them. Is written in a lucid style, suitable for forensic scientists and lawyers with minimal mathematical background. Includes a foreword by Ian Evett. The clear and accessible style of this second edition makes this book ideal for all forensic scientists, applied statisticians and graduate students wishing to evaluate forensic findings from the perspective of probability and decision analysis. It will also appeal to lawyers and other scientists and professionals interested in the evaluation and interpretation of forensic findings, including decision making based on scientific information.

Modeling and Reasoning with Bayesian Networks Springer
Although many Bayesian Network (BN) applications are now in everyday use, BNs have not yet achieved mainstream penetration. Focusing on practical real-world problem solving and model building, as opposed to algorithms and theory, Risk Assessment and Decision Analysis with Bayesian Networks explains how to incorporate knowledge with data to develop and use (Bayesian) causal models of risk that provide powerful insights and better decision making. Provides all tools necessary to build and run realistic Bayesian network models Supplies extensive example models based on real risk assessment problems in a wide range of application domains provided; for example, finance, safety, systems reliability, law, and more Introduces all necessary mathematics, probability, and statistics as needed The book first establishes the basics of probability, risk, and building and using BN models, then goes into the detailed applications. The underlying BN algorithms appear in appendices rather than the main text since there is no need to understand them to build and use BN models. Keeping the body of the text free of intimidating mathematics, the book provides pragmatic advice about model building to ensure models are built efficiently. A dedicated website, www.BayesianRisk.com, contains executable versions of all of the models described, exercises and worked solutions for all chapters, PowerPoint slides, numerous other resources, and a free downloadable copy of the AgenaRisk software.

With an example of a Multi-Disciplinary Treatment Decision for Laryngeal Cancer Cambridge University Press
Bayesian Networks, the result of the convergence of artificial intelligence with statistics, are growing in popularity. Their versatility and modelling power is now employed across a variety of fields for the purposes of analysis, simulation, prediction and diagnosis. This book provides a general introduction to Bayesian networks, defining and illustrating the basic concepts with pedagogical examples and twenty real-life case studies drawn from a range of fields including medicine, computing, natural sciences and engineering. Designed to help analysts, engineers, scientists and professionals taking part in complex decision processes to successfully implement Bayesian networks, this book equips readers with proven methods to generate, calibrate, evaluate and validate Bayesian networks. The book: Provides the tools to overcome common practical challenges such as the

treatment of missing input data, interaction with experts and decision makers, determination of the optimal granularity and size of the model. Highlights the strengths of Bayesian networks whilst also presenting a discussion of their limitations. Compares Bayesian networks with other modelling techniques such as neural networks, fuzzy logic and fault trees. Describes, for ease of comparison, the main features of the major Bayesian network software packages: Netica, Hugin, Elvira and Discoverer, from the point of view of the user. Offers a historical perspective on the subject and analyses future directions for research. Written by leading experts with practical experience of applying Bayesian networks in finance, banking, medicine, robotics, civil engineering, geology, geography, genetics, forensic science, ecology, and industry, the book has much to offer both practitioners and researchers involved in statistical analysis or modelling in any of these fields.

Knowledge Representation for Health-Care John Wiley & Sons

Bayesian Networks and Influence Diagrams: A Guide to Construction and Analysis, Second Edition, provides a comprehensive guide for practitioners who wish to understand, construct, and analyze intelligent systems for decision support based on probabilistic networks. This new edition contains six new sections, in addition to fully-updated examples, tables, figures, and a revised appendix. Intended primarily for practitioners, this book does not require sophisticated mathematical skills or deep understanding of the underlying theory and methods nor does it discuss alternative technologies for reasoning under uncertainty. The theory and methods presented are illustrated through more than 140 examples, and exercises are included for the reader to check his or her level of understanding. The techniques and methods presented for knowledge elicitation, model construction and verification, modeling techniques and tricks, learning models from data, and analyses of models have all been developed and refined on the basis of numerous courses that the authors have held for practitioners worldwide.

Bayesian Networks CRC Press

Disk contains: Tool for building Bayesian networks -- Library of examples -- Library of proposed solutions to some exercises.

Statistical Methods in Healthcare CRC Press

The practice of modern medicine and biomedical research requires sophisticated information technologies with which to manage patient information, plan diagnostic procedures, interpret laboratory results, and carry out investigations. Biomedical Informatics provides both a conceptual framework and a practical inspiration for this swiftly emerging scientific discipline at the intersection of computer science, decision science, information science, cognitive science, and biomedicine. Now revised and in its third edition, this text meets the growing demand by practitioners, researchers, and students for a comprehensive introduction to key topics in the field. Authored by leaders in medical informatics and extensively tested in their courses, the chapters in this volume constitute an effective textbook for students of medical informatics and its areas of application. The book is also a useful reference work for individual readers needing to understand the role that computers can play in the provision of clinical services and the pursuit of biological questions. The volume is organized so as first to

explain basic concepts and then to illustrate them with specific systems and technologies.

Bayesian Networks in R Walter de Gruyter GmbH & Co KG

This book provides a thorough introduction to the formal foundations and practical applications of Bayesian networks. It provides an extensive discussion of techniques for building Bayesian networks that model real-world situations, including techniques for synthesizing models from design, learning models from data, and debugging models using sensitivity analysis. It also treats exact and approximate inference algorithms at both theoretical and practical levels. The author assumes very little background on the covered subjects, supplying in-depth discussions for theoretically inclined readers and enough practical details to provide an algorithmic cookbook for the system developer.

Bayesian Approaches to Clinical Trials and Health-Care Evaluation Morgan Kaufmann

This book constitutes the proceedings of the KR4HC 2010 workshop held at ECAI in Lisbon, Portugal, in August 2010. The 11 extended papers presented were carefully reviewed and selected from 19 submissions. The papers cover topics like ontologies, patient data, records, and guidelines, and clinical practice guidelines.

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