Intelligence-Based

Medicine

Artificial Intelligence and Human Cognition
in Clinical Medicine and Healthcare

Anthony C. Chang

[PDF] Intelligence-Based Medicine: Artificial Intelligence And Human Cognition In Clinical Medicine And Healthcare

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Intelligence-Based Medicine-Anthony C. Chang 2020-06-27 Intelligence-Based Medicine: Data Science, Artificial Intelligence, and Human Cognition in Clinical Medicine and Healthcare provides a multidisciplinary and comprehensive survey of artificial intelligence concepts and methodologies with real life applications in healthcare and medicine. Authored by a senior physician-data scientist, the book presents an intellectual and academic interface between the medical and the data science domains that is symmetric and balanced. The content consists of basic concepts of artificial intelligence and its real-life applications in a myriad of medical areas as well as medical and surgical subspecialties. It brings section summaries to emphasize key concepts delineated in each section; mini-topics authored by world-renowned experts in the respective key areas for their personal perspective; and a compendium of practical resources, such as glossary, references, best articles, and top companies. The goal of the book is to inspire clinicians to embrace the artificial intelligence methodologies as well as to educate data scientists about the medical ecosystem, in order to create a transformational paradigm for healthcare and medicine by using this emerging new technology. Covers a wide range of relevant topics from cloud computing, intelligent agents, to deep reinforcement learning and internet of everything Presents the concepts of artificial intelligence and its applications in an easy-to-understand format accessible to clinicians and data scientists Discusses how artificial intelligence can be utilized in a myriad of subspecialties and imagined of the future Delineates the necessary elements for successful implementation of artificial intelligence in medicine and healthcare

Artificial Intelligence in Medicine-Lei Xing 2020-09-16 Artificial Intelligence Medicine: Technical Basis and Clinical Applications presents a comprehensive overview of the field, ranging from its history and technical foundations, to specific clinical applications and finally to prospects. Artificial Intelligence (AI) is expanding across all domains at a breakneck speed. Medicine, with the availability of large multidimensional datasets, lends itself to strong potential advancement with the appropriate harnessing of AI. The integration of AI can occur throughout the continuum of medicine: from basic laboratory discovery to clinical application and healthcare delivery. Integrating AI within medicine has been met with both excitement and scepticism. By understanding how AI works, and developing an appreciation for both limitations and strengths, clinicians can harness its computational power to streamline workflow and improve patient care. It also provides the opportunity to improve upon research methodologies beyond what is currently available using traditional statistical approaches. On the other hand, computers scientists and data analysts can provide solutions, but often lack easy access to clinical insight that may help focus their efforts. This book provides vital background knowledge to help bring these two groups together, and to engage in more streamlined

dialogue to yield productive collaborative solutions in the field of medicine. Provides history and overview of artificial intelligence, as narrated by pioneers in the field Discusses broad and deep background and updates on recent advances in both medicine and artificial intelligence that enabled the application of artificial intelligence Addresses the ever-expanding application of this novel technology and discusses some of the unique challenges associated with such an approach

Artificial Intelligence In Medicine-Peter Szolovits 2019-03-13 This book introduces the field of artificial intelligence in medicine, a new research area that combines sophisticated representational and computing techniques with the insights of expert physicians to produce tools for improving health care. An introductory chapter describes the historical and technical foundations of the work and provides an overview of the current state of the art and research directions. The authors then describe four prototype computer programs that tackle difficult clinical problems in a manner similar to that of an expert physician. The programs presented are internist, a diagnostic aid that combines a large database of disease/manifestation associations with techniques for problem formulation; expert and the Glaucoma Program which use physiological models for the diagnosis and treatment of eye disease; mycin, a rule-based program for diagnosis and therapy selection for infectious diseases; and the Digitalis Therapy Advisor, which aids the physician in prescribing the right dose of the drug digitalis and also explains its actions.

Medical Applications of Artificial Intelligence-Arvin Agah 2013-11-06 Enhanced, more reliable, and better understood than in the past, artificial intelligence (AI) systems can make providing healthcare more accurate, affordable, accessible, consistent, and efficient. However, AI technologies have not been as well integrated into medicine as predicted. In order to succeed, medical and computational scientists must develop hybrid systems that can effectively and efficiently integrate the experience of medical care professionals with capabilities of AI systems. After providing a general overview of artificial intelligence concepts, tools, and techniques, Medical Applications of Artificial Intelligence

reviews the research, focusing on state-of-the-art projects in the field. The book captures the breadth and depth of the medical applications of artificial intelligence, exploring new developments and persistent challenges.

Artificial Intelligence in Medicine-Carlo Combi 2009-07-13 This book constitutes the refereed proceedings of the 12th Conference on Artificial Intelligence in Medicine in Europe, AIME 2009, held in Verona, Italy in July 2009. The 24 revised long papers and 36 revised short papers presented together with 2 invited talks were carefully reviewed and selected from 140 submissions. The papers are organized in topical sections on agent-based systems, temporal data mining, machine learning and knowledge discovery, text mining, natural language processing and generation, ontologies, decision support systems, applications of AI-based image processing techniques, protocols and guidelines, as well as workflow systems.

Artificial Intelligence in Medicine-David Riaño 2019-06-19 This book constitutes the refereed proceedings of the 17th Conference on Artificial Intelligence in Medicine, AIME 2019, held in Poznan, Poland, in June 2019. The 22 revised full and 31 short papers presented were carefully reviewed and selected from 134 submissions. The papers are organized in the following topical sections: deep learning; simulation; knowledge representation; probabilistic models; behavior monitoring; clustering, natural language processing, and decision support; feature selection; image processing; general machine learning; and unsupervised learning.

Artificial Intelligence in Medical Imaging-Lia Morra 2019-11-25 This book, written by authors with more than a decade of experience in the design and development of artificial intelligence (AI) systems in medical imaging, will guide readers in the understanding of one of the most exciting fields today. After an introductory description of classical machine learning techniques, the fundamentals of deep learning are explained in a simple yet comprehensive manner. The book then proceeds with a historical perspective of how medical AI developed in time, detailing which applications triumphed and which failed, from the era of computer aided

detection systems on to the current cutting-edge applications in deep learning today, which are starting to exhibit on-par performance with clinical experts. In the last section, the book offers a view on the complexity of the validation of artificial intelligence applications for commercial use, describing the recently introduced concept of software as a medical device, as well as good practices and relevant considerations for training and testing machine learning systems for medical use. Open problematics on the validation for public use of systems which by nature continuously evolve through new data is also explored. The book will be of interest to graduate students in medical physics, biomedical engineering and computer science, in addition to researchers and medical professionals operating in the medical imaging domain, who wish to better understand these technologies and the future of the field. Features: An accessible yet detailed overview of the field Explores a hot and growing topic Provides an interdisciplinary perspective

Artificial Intelligence in Healthcare-Adam Bohr 2020-06-21 Artificial Intelligence (AI) in Healthcare is more than a comprehensive introduction to artificial intelligence as a tool in the generation and analysis of healthcare data. The book is split into two sections where the first section describes the current healthcare challenges and the rise of AI in this arena. The ten following chapters are written by specialists in each area, covering the whole healthcare ecosystem. First, the AI applications in drug design and drug development are presented followed by its applications in the field of cancer diagnostics, treatment and medical imaging. Subsequently, the application of AI in medical devices and surgery are covered as well as remote patient monitoring. Finally, the book dives into the topics of security, privacy, information sharing, health insurances and legal aspects of AI in healthcare. Highlights different data techniques in healthcare data analysis, including machine learning and data mining Illustrates different applications and challenges across the design, implementation and management of intelligent systems and healthcare data networks Includes applications and case studies across all areas of AI in healthcare data

Artificial Intelligence in Medical Imaging-

Erik R. Ranschaert 2019-01-29 This book provides a thorough overview of the ongoing evolution in the application of artificial intelligence (AI) within healthcare and radiology, enabling readers to gain a deeper insight into the technological background of AI and the impacts of new and emerging technologies on medical imaging. After an introduction on game changers in radiology, such as deep learning technology, the technological evolution of AI in computing science and medical image computing is described, with explanation of basic principles and the types and subtypes of AI. Subsequent sections address the use of imaging biomarkers, the development and validation of AI applications, and various aspects and issues relating to the growing role of big data in radiology. Diverse real-life clinical applications of AI are then outlined for different body parts, demonstrating their ability to add value to daily radiology practices. The concluding section focuses on the impact of AI on radiology and the implications for radiologists, for example with respect to training. Written by radiologists and IT professionals, the book will be of high value for radiologists, medical/clinical physicists, IT specialists, and imaging informatics professionals.

Artificial Intelligence for Drug Development, Precision Medicine, and Healthcare-Mark Chang 2020-05-12 Artificial Intelligence for Drug Development, Precision Medicine, and Healthcare covers exciting developments at the intersection of computer science and statistics. While much of machine-learning is statistics-based, achievements in deep learning for image and language processing rely on computer science's use of big data. Aimed at those with a statistical background who want to use their strengths in pursuing AI research, the book: · Covers broad AI topics in drug development, precision medicine, and healthcare. · Elaborates on supervised, unsupervised, reinforcement, and evolutionary learning methods. · Introduces the similarity principle and related AI methods for both big and small data problems. · Offers a balance of statistical and algorithm-based approaches to AI. · Provides examples and real-world applications with hands-on R code. · Suggests the path forward for AI in medicine and artificial general intelligence. As well as covering the history of AI and the innovative ideas, methodologies and software implementation of the field, the book offers a comprehensive review

of AI applications in medical sciences. In addition, readers will benefit from hands on exercises, with included R code.

Artificial Intelligence-Sandeep Reddy 2020-12-02 The rediscovery of the potential of artificial intelligence (AI) to improve healthcare delivery and patient outcomes has led to an increasing application of AI techniques such as deep learning, computer vision, natural language processing, and robotics in the healthcare domain. Many governments and health authorities have prioritized the application of AI in the delivery of healthcare. Also, technological giants and leading universities have established teams dedicated to the application of AI in medicine. These trends will mean an expanded role for AI in the provision of healthcare. Yet, there is an incomplete understanding of what AI is and its potential for use in healthcare. This book discusses the different types of AI applicable to healthcare and their application in medicine, population health, genomics, healthcare administration, and delivery. Readers, especially healthcare professionals and managers, will find the book useful to understand the different types of AI and how they are relevant to healthcare delivery. The book provides examples of AI being applied in medicine, population health, genomics, healthcare administration, and delivery and how they can commence applying AI in their health services. Researchers and technology professionals will also find the book useful to note current trends in the application of AI in healthcare and initiate their own projects to enable the application of AI in healthcare/medical domains.

Artificial Intelligence in Medicine-Annette ten Teije 2017-06-12 This book constitutes the refereed proceedings of the 16th Conference on Artificial Intelligence in Medicine, AIME 2017, held in Vienna, Austria, in June 2017. The 21 revised full and 23 short papers presented were carefully reviewed and selected from 113 submissions. The papers are organized in the following topical sections: ontologies and knowledge representation; Bayesian methods; temporal methods; natural language processing; health care processes; and machine learning, and a section with demo papers.

Artificial Intelligence in Behavioral and Mental Health Care-David D. Luxton 2015-09-10 Artificial Intelligence in Behavioral and Mental Health Care summarizes recent advances in artificial intelligence as it applies to mental health clinical practice. Each chapter provides a technical description of the advance, review of application in clinical practice, and empirical data on clinical efficacy. In addition, each chapter includes a discussion of practical issues in clinical settings, ethical considerations, and limitations of use. The book encompasses AI based advances in decision-making, in assessment and treatment, in providing education to clients, robot assisted task completion, and the use of AI for research and data gathering. This book will be of use to mental health practitioners interested in learning about, or incorporating AI advances into their practice and for researchers interested in a comprehensive review of these advances in one source. Summarizes AI advances for use in mental health practice Includes advances in AI based decision-making and consultation Describes AI applications for assessment and treatment Details AI advances in robots for clinical settings Provides empirical data on clinical efficacy Explores practical issues of use in clinical settings

Deep Medicine-Eric Topol 2019-03-12 One of America's top doctors reveals how AI will empower physicians and revolutionize patient care Medicine has become inhuman, to disastrous effect. The doctor-patient relationship--the heart of medicine--is broken: doctors are too distracted and overwhelmed to truly connect with their patients, and medical errors and misdiagnoses abound. In Deep Medicine, leading physician Eric Topol reveals how artificial intelligence can help. AI has the potential to transform everything doctors do, from notetaking and medical scans to diagnosis and treatment, greatly cutting down the cost of medicine and reducing human mortality. By freeing physicians from the tasks that interfere with human connection, AI will create space for the real healing that takes place between a doctor who can listen and a patient who needs to be heard. Innovative, provocative, and hopeful, Deep Medicine shows us how the awesome power of AI can make medicine better, for all the humans involved.

Artificial Intelligence in Medicine-Elpida Keravnou-Papailiou 1997-03-12 Content Description #Includes bibliographical references and index.

AI in Health-Tom Lawry 2020-02-25 We are in the early stages of the next big platform shift in healthcare computing. Fueled by Artificial Intelligence (AI) and the Cloud, this shift is already transforming the way health and medical services are provided. As the industry transitions from static digital repositories to intelligent systems, there will be winners and losers in the race to innovate and automate the provision of services. Critical to success will be the role leaders play in shaping the use of AI to be less "artificial" and more "intelligent" in support of improving processes to deliver care and keep people healthy and productive across all care settings. This book defines key technical, process, people, and ethical issues that need to be understood and addressed in successfully planning and executing an enterprise-wide AI plan. It provides clinical and business leaders with a framework for moving organizations from the aspiration to execution of intelligent systems to improve clinical, operational, and financial performance.

Artificial Intelligence in Precision Health-Debmalya Barh 2020-03-04 Artificial Intelligence in Precision Health: From Concept to Applications provides a readily available resource to understand artificial intelligence and its real time applications in precision medicine in practice. Written by experts from different countries and with diverse background, the content encompasses accessible knowledge easily understandable for non-specialists in computer sciences. The book discusses topics such as cognitive computing and emotional intelligence, big data analysis, clinical decision support systems, deep learning, personal omics, digital health, predictive models, prediction of epidemics, drug discovery, precision nutrition and fitness. Additionally, there is a section dedicated to discuss and analyze AI products related to precision healthcare already available. This book is a valuable source for clinicians, healthcare workers, and researchers from diverse areas of biomedical field who may or may not have computational background and want to learn more about the innovative field of artificial intelligence for precision health. Provides

computational approaches used in artificial intelligence easily understandable for non-computer specialists Gives know-how and real successful cases of artificial intelligence approaches in predictive models, modeling disease physiology, and public health surveillance Discusses the applicability of AI on multiple areas, such as drug discovery, clinical trials, radiology, surgery, patient care and clinical decision support

Artificial Intelligence in Medicine-M. Fieschi 2013-11-11 Expert systems constitute a research area which is currently expanding. This book is based largely on work undertaken for my doctoral thesis and attempts to set out in readily understood language the different methods of knowledge representation used in different systems. How ever, since the field for applications is enormous and touches on many disciplines (engineering science, computing, geology, medicine etc.) only those systems with medical applications are presented. The second part of this book is devoted to detailed discussion of one expert system developed in this department: SPHINX. I wish to thank all those who have given me their support, their criticisms and suggestions: Dominique Fieschi, Michel Joubert, Genevieve Botti, Michel Roux, Jean-Louis Lauriere, as well as the CNRS which supported the ATP Expert Systems Group with an individual grant. Marius Fieschi Foreword This work deals with 'Expert Systems' in the realm of medicine. The phrase 'Expert System' describes an information system not only in terms of its content but also in terms of its application. As with all generic terms, it is condensed to the point where the meaning cannot be guessed from simply reading it. It concerns systems processing knowledge and behaviour in ways close to those of a human expert. In the field of medicine this expert would be the consultant or specialist to whom a family practitioner refers a 'case' which he is unable to diagnose. The study of expert systems is a branch of computer science called artificial intelligence.

Artificial Intelligence in Medicine-Pedro Barahona 1995-06-14 This volume presents the proceedings of the 5th Conference on Artificial Intelligence in Medicine Europe, AIME '95, held in Pavia, Italy in June 1995. The volume contains 32 full refereed selected papers contributed by researchers and professionals coming from

computer science departments, medical informatics departments, and hospitals; in addition there are the keynote address and 28 poster presentations. The volume is organized in topical sections on medical records, temporal reasoning and simulation, probabilistic models, patient management and therapy planning, evaluation of knowledge-based systems, diagnostic support systems, models for clinical information systems, and neural networks and image interpretation.

Artificial Intelligence and Deep Learning in Pathology E-Book-Stanley Cohen 2020-06-02 Recent advances in computational algorithms, along with the advent of whole slide imaging as a platform for embedding artificial intelligence (AI), are transforming pattern recognition and image interpretation for diagnosis and prognosis. Yet most pathologists have just a passing knowledge of data mining, machine learning, and AI, and little exposure to the vast potential of these powerful new tools for medicine in general and pathology in particular. In Artificial Intelligence and Deep Learning in Pathology, Dr. Stanley Cohen covers the nuts and bolts of all aspects of machine learning, up to and including AI, bringing familiarity and understanding to pathologists at all levels of experience. Focuses heavily on applications in medicine, especially pathology, making unfamiliar material accessible and avoiding complex mathematics whenever possible. Covers digital pathology as a platform for primary diagnosis and augmentation via deep learning, whole slide imaging for 2D and 3D analysis, and general principles of image analysis and deep learning. Discusses and explains recent accomplishments such as algorithms used to diagnose skin cancer from photographs, AI-based platforms developed to identify lesions of the retina, using computer vision to interpret electrocardiograms, identifying mitoses in cancer using learning algorithms vs. signal processing algorithms, and many more.

Handbook of Artificial Intelligence in Biomedical Engineering-Saravanan Krishnan 2020-12-15 "Handbook of Artificial Intelligence in Biomedical Engineering focuses on recent AI technologies and applications that provide some very promising solutions and enhanced technology in the biomedical field. Recent advancements in computational techniques, such as machine learning, Internet of Things (IoT),

and big data, accelerate the deployment of biomedical devices in various healthcare applications. This volume explores how artificial intelligence (AI) can be applied to these expert systems by mimicking the human expert's knowledge in order to predict and monitor the health status in real time. The accuracy of the AI systems is drastically increasing by using machine learning, digitized medical data acquisition, wireless medical data communication, and computing infrastructure AI approaches, helping to solve complex issues in the biomedical industry and playing a vital role in future healthcare applications. The volume takes a multidisciplinary perspective of employing these new applications in biomedical engineering, exploring the combination of engineering principles with biological knowledge that contributes to the development of revolutionary and life-saving concepts. Topics include: Security and privacy issues in biomedical AI systems and potential solutions Healthcare applications using biomedical AI systems Machine learning in biomedical engineering Live patient monitoring systems Semantic annotation of healthcare data This book presents a broad exploration of biomedical systems using artificial intelligence techniques with detailed coverage of the applications, techniques, algorithms, platforms, and tools in biomedical AI systems. This book will benefit researchers, medical and industry practitioners, academicians, and students"--

Artificial Intelligence in Surgery: Understanding the Role of AI in Surgical Practice-Daniel A. Hashimoto 2021-07-09 Publisher's Note: Products purchased from Third Party sellers are not guaranteed by the publisher for quality, authenticity, or access to any online entitlements included with the product. Build a solid foundation in surgical AI with this engaging, comprehensive guide for AI novices Machine learning, neural networks, and computer vision in surgical education, practice, and research will soon be de rigueur. Written for surgeons without a background in math or computer science, Artificial Intelligence in Surgery provides everything you need to evaluate new technologies and make the right decisions about bringing AI into your practice. Comprehensive and easy to understand, this first-of-its-kind resource illustrates the use of AI in surgery through real-life examples. It covers the issues most relevant to your practice,

including: Neural Networks and Deep Learning Natural Language Processing Computer Vision Surgical Education and Simulation Preoperative Risk Stratification Intraoperative Video Analysis OR Black Box and Tracking of Intraoperative Events Artificial Intelligence and Robotic Surgery Natural Language Processing for Clinical Documentation Leveraging Artificial Intelligence in the EMR Ethical Implications of Artificial Intelligence in Surgery Artificial Intelligence and Health Policy Assessing Strengths and Weaknesses of Artificial Intelligence Research Finally, the appendix includes a detailed glossary of terms and important learning resources and techniques—all of which helps you interpret claims made by studies or companies using AI.

Artificial Intelligence in Medicine-Silvia Miksch 2005-08-29 The present volume contains the proceedings of AIME 2005, the 10th conference on Artificial Intelligence in Medicine, held in Aberdeen, Scotland, July 23-27, 2005.

Machine Learning and AI for Healthcare-Arjun Panesar 2019-02-04 Explore the theory and practical applications of artificial intelligence (AI) and machine learning in healthcare. This book offers a guided tour of machine learning algorithms, architecture design, and applications of learning in healthcare and big data challenges. You'll discover the ethical implications of healthcare data analytics and the future of AI in population and patient health optimization. You'll also create a machine learning model, evaluate performance and operationalize its outcomes within your organization. Machine Learning and AI for Healthcare provides techniques on how to apply machine learning within your organization and evaluate the efficacy, suitability, and efficiency of AI applications. These are illustrated through leading case studies, including how chronic disease is being redefined through patient-led data learning and the Internet of Things. What You'll Learn Gain a deeper understanding of key machine learning algorithms and their use and implementation within wider healthcare Implement machine learning systems, such as speech recognition and enhanced deep learning/AI Select learning methods/algorithms and tuning for use in healthcare Recognize and prepare for the future of artificial intelligence in healthcare through best practices, feedback loops and intelligent agents Who This Book Is For Health care

professionals interested in how machine learning can be used to develop health intelligence – with the aim of improving patient health, population health and facilitating significant care-payer cost savings.

eHealth-Thomas F. Heston 2018-08-01 eHealth has revolutionized health care and the practice of medicine. Internet technologies have given the most rural communities access to healthcare services, and automated computer algorithms are improving medical diagnoses and speeding up the delivery of care. Handheld apps, wearable devices, and artificial intelligence lead the way, creating a global healthcare solution that is smarter and more accessible. Read what leaders in the field are doing to advance the use of electronic technology to improve global health.

Artificial Intelligence in Decision Support Systems for Diagnosis in Medical Imaging-Kenji Suzuki 2018-01-09 This book offers the first comprehensive overview of artificial intelligence (AI) technologies in decision support systems for diagnosis based on medical images, presenting cutting-edge insights from thirteen leading research groups around the world. Medical imaging offers essential information on patients' medical condition, and clues to causes of their symptoms and diseases. Modern imaging modalities, however, also produce a large number of images that physicians have to accurately interpret. This can lead to an "information overload" for physicians, and can complicate their decision-making. As such, intelligent decision support systems have become a vital element in medical-image-based diagnosis and treatment. Presenting extensive information on this growing field of AI, the book offers a valuable reference guide for professors, students, researchers and professionals who want to learn about the most recent developments and advances in the field.

Readings in Medical Artificial Intelligence-William J. Clancey 1984

Machine Learning in Cardiovascular Medicine-Subhi J. Al'Aref 2020-11-20 Machine Learning in Cardiovascular Medicine addresses the ever-expanding applications of artificial intelligence (AI), specifically machine learning

(ML), in healthcare and within cardiovascular medicine. The book focuses on emphasizing ML for biomedical applications and provides a comprehensive summary of the past and present of AI, basics of ML, and clinical applications of ML within cardiovascular medicine for predictive analytics and precision medicine. It helps readers understand how ML works along with its limitations and strengths, such that they can could harness its computational power to streamline workflow and improve patient care. It is suitable for both clinicians and engineers; providing a template for clinicians to understand areas of application of machine learning within cardiovascular research; and assist computer scientists and engineers in evaluating current and future impact of machine learning on cardiovascular medicine. Provides an overview of machine learning, both for a clinical and engineering audience Summarize recent advances in both cardiovascular medicine and artificial intelligence Discusses the advantages of using machine learning for outcomes research and image processing Addresses the ever-expanding application of this novel technology and discusses some of the unique challenges associated with such an approach

Artificial Intelligence in Medicine-Werner Horn 2003-05-21 This book constitutes the refereed proceedings of the Joint European Conference on Artificial Intelligence in Medicine and Medical Decision Making, AIMDM'99, held in Aalborg, Denmark, in June 1999. The 27 full papers and 19 short papers presented in the book together with four invited papers were selected from 90 submissions. The papers are organized in topical sections on guidelines and protocols; decision support systems, knowledge-based systems, and cooperative systems; model-based systems; neural nets and causal probabilistic networks; knowledge representation; temporal reasoning; machine learning; natural language processing; and image processing and computer aided design.

Artificial Intelligence in Medicine: Knowledge Representation and Transparent and Explainable Systems-Mar Marcos 2020-01-03 This book constitutes revised selected papers from the AIME 2019 workshops KR4HC/ProHealth 2019, the Workshop on Knowledge Representation for Health Care and Process-Oriented Information Systems in Health

Care, and TEAAM 2019, the Workshop on Transparent, Explainable and Affective AI in Medical Systems. The volume contains 5 full papers from KR4HC/ProHealth, which were selected out of 13 submissions. For TEAAM 8 papers out of 10 submissions were accepted for publication.

Computational Intelligence and Its Applications in Healthcare-Prashant Johri 2020-08-01 Computational Intelligence and Its Applications in Healthcare presents rapidly growing applications of computational intelligence for healthcare systems, including intelligent synthetic characters, man-machine interface, menu generators, user acceptance analysis, pictures archiving, and communication systems. Computational intelligence is the study of the design of intelligent agents, which are systems that act intelligently: they do what they think are appropriate for their circumstances and goals; they're flexible to changing environments and goals; they learn from experience; and they make appropriate choices given perceptual limitations and finite computation. Computational intelligence paradigms offer many advantages in maintaining and enhancing the field of healthcare. Provides coverage of fuzzy logic, neural networks, evolutionary computation, learning theory, probabilistic methods, telemedicine, and robotics applications Includes coverage of artificial intelligence and biological applications, soft computing, image and signal processing, and genetic algorithms Presents the latest developments in computational methods in healthcare Bridges the gap between obsolete literature and current literature

Artificial Intelligence In Medicine-Peter Szolovits 1982-08-04

Artificial Intelligence for Computational Modeling of the Heart-Tommaso Mansi 2019-11-25 Artificial Intelligence for Computational Modeling of the Heart presents recent research developments towards streamlined and automatic estimation of the digital twin of a patient's heart by combining computational modeling of heart physiology and artificial intelligence. The book first introduces the major aspects of multi-scale modeling of the heart, along with the compromises needed to achieve subject-specific simulations. Reader will

then learn how AI technologies can unlock robust estimations of cardiac anatomy, obtain meta-models for real-time biophysical computations, and estimate model parameters from routine clinical data. Concepts are all illustrated through concrete clinical applications. Presents recent advances in computational modeling of heart function and artificial intelligence technologies for subject-specific applications Discusses AI-based technologies for robust anatomical modeling from medical images, data-driven reduction of multi-scale cardiac models, and estimations of physiological parameters from clinical data Illustrates the technology through concrete clinical applications and discusses potential impacts and next steps needed for clinical translation

Artificial Intelligence in Medicine-Steen Andreassen 1993 The knowledge-based management of medical acts in NUCLEUS -- Knowledge Acquisition, Representation & Learning -- Knowledge Representation and Modelling in HYBRIKON -- Knowledge Organisation in Medical KBS Construetion -- A Framework for Modular Knowledge Bases in the Domain of Hypertension Diseases -- KAVAS-2: Knowledge Acquisition, Visualisation and Assessment System -- KAVAS's Framework for quality assessment of medical knowledge -- KAVAS's Conditioning of the Induction Algorithm -- Clinical decision-support in the field of TETANUS serology using an associative storage model implemented in LISP -- Model based learning support to knowledge acquisition: A clinical case study -- MODELS FOR MEDICAL KNOWLEDGE REPRESENTATION AND MEDICAL REASONING IN A C.A.I SYSTEM -- Case Based Reasoning in Clinical Evaluation -- Object-oriented mentality: the most suited paradigm for medical knowledge-based systems -- Applications Based on Neural Nets -- Classification of protein patterns using neural networks: pixel based versus feature based approach -- Evaluation of an epiderniological data set as an example of the application of neural networks to the analysis of large medical data sets -- A Neural Network Modular System for Object Classification in Brain MR Images -- A Neural Network Identifies Faces with Morphological Syndromes -- Grading of Gliomas in Stereotactic Biopsies with Neural Networks -- Self Organizing Maps for the Evaluation of High Resolution ECG -- AUTHOR INDEX

Data Pulse-Matthew Marcetich 2020-04-06 For many of us, machine learning and artificial intelligence (AI) are abstract terms that have become popularized for their roles in automation and robotics. In healthcare, uses of AI emerged several decades ago and have significantly expanded to the present day. Data Pulse presents a current snapshot of uses of AI in healthcare, including essential opportunities and challenges. The discussion explores its impact at many levels of the healthcare system, from researchers and entrepreneurs to physicians and patients. With easily understood language, Marcetich defines common terms of AI and shows us how various AI tools are influencing research, clinical, and administrative areas of healthcare. The reader will learn how current discoveries build on the decades of previous work in biology, robotics, and computer science, along with the unforeseen ethical and legal challenges they have provoked. Data Pulse is a story of important partnerships and strategies that are reshaping modern healthcare through AI. It will inform our view of the past, present, and rapidly evolving future of AI in healthcare.

Machine Learning and the Internet of Medical Things in Healthcare-Krishna Kant Singh 2021-04-26 Machine Learning and the Internet of Medical Things in Healthcare discusses the applications and challenges of machine learning for healthcare applications. The book provides a platform for presenting machine learning-enabled healthcare techniques and offers a mathematical and conceptual background of the latest technology. It describes machine learning techniques along with the emerging platform of the Internet of Medical Things used by practitioners and researchers worldwide. The book includes deep feed forward networks, regularization, optimization algorithms, convolutional networks, sequence modeling, and practical methodology. It also presents the concepts of the Internet of Things, the set of technologies that develops traditional devices into smart devices. Finally, the book offers research perspectives, covering the convergence of machine learning and IoT. It also presents the application of these technologies in the development of healthcare frameworks. Provides an introduction to the Internet of Medical Things through the principles and applications of machine learning Explains the functions and applications of machine learning in

various applications such as ultrasound imaging, biomedical signal processing, robotics, and biomechatronics Includes coverage of the evolution of healthcare applications with machine learning, including Clinical Decision Support Systems, artificial intelligence in biomedical engineering, and AI-enabled connected health informatics, supported by real-world case studies

Artificial Intelligence in Medicine-Silvana Quaglini 2001-06-22 This book constitutes the refereed proceedings of the 8th Conference on Artificial Intelligence in Medicine in Europe, AIME 2001, held in Cascais, Portugal in July 2001. The 31 revised full papers presented together with 30 posters and two invited papers were carefully reviewed and selected from 79 submissions. Among the topics addressed in their context on medical information processing are knowledge management, machine learning, data mining, decision support systems, temporal reasoning, case-based reasoning, planning and scheduling, natural language processing, computer vision, image and signal interpretation, intelligent agents, telemedicine, careflow systems, and cognitive modeling.

Artificial Intelligence in Medicine-Elpida Keravnou-Papailiou 1997-03-12 Content Description #Includes bibliographical references and index.

Progress in Artificial Intelligence-Paulo Moura Oliveira 2019-09-03 This book constitutes the refereed proceedings of the 19th EPIA Conference on Artificial Intelligence, EPIA 2019, held in Funchal, Madeira, Portugal, in September 2019. The 119 revised full papers and 6 short papers presented were carefully reviewed and selected from a total of 252 submissions. The

papers are organized in 18 tracks devoted to the following topics: AIEd - Artificial Intelligence in Education, AI4G - Artificial Intelligence for Games, AIoTA - Artificial Intelligence and IoT in Agriculture, AIL - Artificial Intelligence and Law, AIM - Artificial Intelligence in Medicine, AICPDES - Artificial Intelligence in Cyber-Physical and Distributed Embedded Systems, AIPES - Artificial Intelligence in Power and Energy Systems, AITS - Artificial Intelligence in Transportation Systems, ALEA - Artificial Life and Evolutionary Algorithms, AmIA - Ambient Intelligence and Affective Environments, BAAI - Business Applications of Artificial Intelligence, GAI- General AI, IROBOT - Intelligent Robotics, KDBI - Knowledge Discovery and Business Intelligence, KRR - Knowledge Representation and Reasoning, MASTA - Multi-Agent Systems: Theory and Applications, SSM - Social Simulation and Modelling, TeMA - Text Mining and Applications.

Medical Imaging-K.C. Santosh 2019-08-20 The book discusses varied topics pertaining to advanced or up-to-date techniques in medical imaging using artificial intelligence (AI), image recognition (IR) and machine learning (ML) algorithms/techniques. Further, coverage includes analysis of chest radiographs (chest x-rays) via stacked generalization models, TB type detection using slice separation approach, brain tumor image segmentation via deep learning, mammogram mass separation, epileptic seizures, breast ultrasound images, knee joint x-ray images, bone fracture detection and labeling, and diabetic retinopathy. It also reviews 3D imaging in biomedical applications and pathological medical imaging.