

Biomedical Image Analysis And Mining Techniques For Improved Health Outcomes Advances In Bioinformatics And Biomedical Engineering

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Design and Implementation of Healthcare Biometric Systems - Kisku, Dakshina Ranjan
2019-01-11

Healthcare sectors often deal with a large amount of data related to patients' care and hospital workforce management. Mistakes occur, and the impending results are disastrous for individuals' personal identity information. However, an innovative and reliable way to safeguard the identity of individuals and provide protection of medical records from criminals is already in effect. Design and Implementation of Healthcare Biometric Systems provides innovative insights into medical identity theft and the benefits behind biometrics technologies that could be offered to protect medical records from hackers and malicious users. The content within this publication represents the work of ASD screening systems, healthcare management, and patient rehabilitation. It is designed for educators, researchers, faculty members, industry practitioners, graduate students, and professionals working with healthcare services and covers topics centered on understanding the

practical essence of next-generation healthcare biometrics systems and future research directions.

Ethical Implications of Reshaping Healthcare With Emerging Technologies - Musiolik, Thomas Heinrich
2021-10-01

Improving quality of life is one of the main advantages of integrating new innovations into medicine. New technologies are revolutionizing medicine and opening new opportunities for patients, doctors, clinics, and companies. The patient's well-being is monitored autonomously by smartphones, digital medical records simplify everyday clinical work, virtual reality is used for treatment, and robots help in the operating room. The new technological possibilities in healthcare not only change patients' lives, but also the work of doctors, clinics, and companies. In the fields of healthcare and medicine, new technologies can be used for patient communication, health monitoring, or for the

treatment of patients, and modern research is devoted to advancing and understanding these technologies. Ethical Implications of Reshaping Healthcare With Emerging Technologies includes the most up-to-date research in the fields of healthcare and medicine worldwide, provides answers to the forms of treatment that are already possible in medicine, and illuminates the future possibilities that are already being researched. In addition, today's knowledge is translated and shown in how new technologies such as autonomous VR-system can be used for pain reduction as part of a treatment. Finally, this book examines the ethical guidelines in healthcare and medicine that are associated with the rapid development of these technologies. This book will be useful for the healthcare industry, hospital administration, the health insurance industry, doctors, healthcare workers, business professionals, IT specialists, medical software designers,

scientists, practitioners, researchers, academicians, and students looking for the latest information on the use of emerging technologies in healthcare settings.

Biomedical Data Mining for Information Retrieval -

Sujata Dash 2021-08-24

BIOMEDICAL DATA MINING FOR INFORMATION

RETRIEVAL This book not only emphasizes traditional computational techniques, but discusses data mining, biomedical image processing, information retrieval with broad coverage of basic scientific applications.

Biomedical Data Mining for Information Retrieval comprehensively covers the topic of mining biomedical text, images and visual features towards information retrieval.

Biomedical and health informatics is an emerging field of research at the intersection of information science, computer science, and healthcare and brings tremendous opportunities and challenges due to easily available and abundant

biomedical data for further analysis. The aim of healthcare informatics is to ensure the high-quality, efficient healthcare, better treatment and quality of life by analyzing biomedical and healthcare data including patient's data, electronic health records (EHRs) and lifestyle.

Previously, it was a common requirement to have a domain expert to develop a model for biomedical or healthcare; however, recent advancements in representation learning algorithms allows us to automatically to develop the model. Biomedical image mining, a novel research area, due to the vast amount of available biomedical images, increasingly generates and stores digitally. These images are mainly in the form of computed tomography (CT), X-ray, nuclear medicine imaging (PET, SPECT), magnetic resonance imaging (MRI) and ultrasound. Patients' biomedical images can be digitized using data mining techniques and may help in answering several important

and critical questions relating to healthcare. Image mining in medicine can help to uncover new relationships between data and reveal new useful information that can be helpful for doctors in treating their patients. Audience Researchers in various fields including computer science, medical informatics, healthcare IOT, artificial intelligence, machine learning, image processing, clinical big data analytics.

Biomedical Image

Processing - Thomas Martin Deserno 2011-03-01

In modern medicine, imaging is the most effective tool for diagnostics, treatment planning and therapy. Almost all modalities have went to directly digital acquisition techniques and processing of this image data have become an important option for health care in future. This book is written by a team of internationally recognized experts from all over the world. It provides a brief but complete overview on medical image processing and analysis highlighting recent advances

that have been made in academics. Color figures are used extensively to illustrate the methods and help the reader to understand the complex topics.

Intelligent Techniques for Data Analysis in Diverse Settings

- Celebi, Numan
2016-04-20

Data analysis forms the basis of many forms of research ranging from the scientific to the governmental. With the advent of machine intelligence and neural networks, extracting, modeling, and approaching data has been unimpeachably altered. These changes, seemingly small, affect the way societies organize themselves, deliver services, or interact with each other. Intelligent Techniques for Data Analysis in Diverse Settings addresses the specialized requirements of data analysis in a comprehensive way. This title contains a comprehensive overview of the most innovative recent approaches borne from intelligent techniques such as neural networks, rough sets,

fuzzy sets, and metaheuristics. Combining new data analysis technologies, applications, emerging trends, and case studies, this publication reviews the intelligent, technological, and organizational aspects of the field. This book is ideally designed for IT professionals and students, data analysis specialists, healthcare providers, and policy makers. *Proceeding of First Doctoral Symposium on Natural Computing Research* - Varsha H. Patil 2021-03-18

The book is a collection of papers presented at First Doctoral Symposium on Natural Computing Research (DSNCR 2020), held during 8 August 2020 in Pune, India. The book covers different topics of applied and natural computing methods having applications in physical sciences and engineering. The book focuses on computer vision and applications, soft computing, security for Internet of Things, security in heterogeneous networks, signal processing, intelligent

transportation system, VLSI design and embedded systems, privacy and confidentiality, big data and cloud computing, bioinformatics and systems biology, remote healthcare, software security, mobile and pervasive computing, biometrics-based authentication, natural language processing, analysis and verification techniques, large scale networking, distributed systems, digital forensics, and human-computer interaction.

Big Data in Multimodal Medical Imaging - Ayman El-Baz 2019-11-06

There is an urgent need to develop and integrate new statistical, mathematical, visualization, and computational models with the ability to analyze Big Data in order to retrieve useful information to aid clinicians in accurately diagnosing and treating patients. The main focus of this book is to review and summarize state-of-the-art big data and deep learning approaches to analyze and integrate multiple data types

for the creation of a decision matrix to aid clinicians in the early diagnosis and identification of high risk patients for human diseases and disorders. Leading researchers will contribute original research book chapters analyzing efforts to solve these important problems.

Applied Machine Learning for Smart Data Analysis -

Nilanjan Dey 2019-05-20

The book focuses on how machine learning and the Internet of Things (IoT) has empowered the advancement of information driven arrangements including key concepts and advancements. Ontologies that are used in heterogeneous IoT environments have been discussed including interpretation, context awareness, analyzing various data sources, machine learning algorithms and intelligent services and applications. Further, it includes unsupervised and semi-supervised machine learning techniques with study of

semantic analysis and thorough analysis of reviews. Divided into sections such as machine learning, security, IoT and data mining, the concepts are explained with practical implementation including results. Key Features Follows an algorithmic approach for data analysis in machine learning Introduces machine learning methods in applications Address the emerging issues in computing such as deep learning, machine learning, Internet of Things and data analytics Focuses on machine learning techniques namely unsupervised and semi-supervised for unseen and seen data sets Case studies are covered relating to human health, transportation and Internet applications

Biomedical Image Analysis and Machine Learning Technologies: Applications and Techniques - Gonzalez, Fabio A. 2009-12-31

Medical images are at the base of many routine clinical decisions and their influence continues to increase in many fields of medicine. Since the

last decade, computers have become an invaluable tool for supporting medical image acquisition, processing, organization and analysis. Biomedical Image Analysis and Machine Learning Technologies: Applications and Techniques provides a panorama of the current boundary between biomedical complexity coming from the medical image context and the multiple techniques which have been used for solving many of these problems. This innovative publication serves as a leading industry reference as well as a source of creative ideas for applications of medical issues. Handbook of Research on Information Security in Biomedical Signal Processing - Pradhan, Chittaranjan 2018-04-13

Recent advancements and innovations in medical image and data processing have led to a need for robust and secure mechanisms to transfer images and signals over the internet and maintain copyright protection. The Handbook of Research on Information

Security in Biomedical Signal Processing provides emerging research on security in biomedical data as well as techniques for accurate reading and further processing. While highlighting topics such as image processing, secure access, and watermarking, this publication explores advanced models and algorithms in information security in the modern healthcare system. This publication is a vital resource for academicians, medical professionals, technology developers, researchers, students, and practitioners seeking current research on intelligent techniques in medical data security.

Soft Computing

Applications - Valentina

Emilia Balas 2017-08-31

These two volumes constitute the Proceedings of the 7th International Workshop on Soft Computing Applications (SOFA 2016), held on 24–26 August 2016 in Arad, Romania. This edition was organized by Aurel Vlaicu University of Arad, Romania, University of

Belgrade, Serbia, in conjunction with the Institute of Computer Science, Iasi Branch of the Romanian Academy, IEEE Romanian Section, Romanian Society of Control Engineering and Technical Informatics (SRAIT) - Arad Section, General Association of Engineers in Romania - Arad Section, and BTM Resources Arad. The soft computing concept was introduced by Lotfi Zadeh in 1991 and serves to highlight the emergence of computing methodologies in which the accent is on exploiting the tolerance for imprecision and uncertainty to achieve tractability, robustness and lower costs. Soft computing facilitates the combined use of fuzzy logic, neurocomputing, evolutionary computing and probabilistic computing, leading to the concept of hybrid intelligent systems. The rapid emergence of new tools and applications calls for a synergy of scientific and technological disciplines in order to reveal the great potential of soft computing in

all domains. The conference papers included in these proceedings, published post-conference, were grouped into the following areas of research:

- Methods and Applications in Electrical Engineering
- Knowledge-Based Technologies for Web Applications, Cloud Computing, Security Algorithms and Computer Networks
- Biomedical Applications
- Image, Text and Signal Processing
- Machine Learning and Applications
- Business Process Management
- Fuzzy Applications, Theory and Fuzzy Control
- Computational Intelligence in Education
- Soft Computing & Fuzzy Logic in Biometrics (SCFLB)
- Soft Computing Algorithms Applied in Economy, Industry and Communication Technology
- Modelling and Applications in Textiles

The book helps to disseminate advances in selected active research directions in the field of soft computing, along with current issues and applications of related topics. As such, it provides valuable information

for professors, researchers and graduate students in the area of soft computing techniques and applications.

Security in Smart Cities: Models, Applications, and Challenges

- Aboul Ella Hassanien 2018-11-04

This book offers an essential guide to IoT Security, Smart Cities, IoT Applications, etc. In addition, it presents a structured introduction to the subject of destination marketing and an exhaustive review on the challenges of information security in smart and intelligent applications, especially for IoT and big data contexts. Highlighting the latest research on security in smart cities, it addresses essential models, applications, and challenges. Written in plain and straightforward language, the book offers a self-contained resource for readers with no prior background in the field. Primarily intended for students in Information Security and IoT applications (including smart cities systems and data heterogeneity), it will also

greatly benefit academic researchers, IT professionals, policymakers and legislators. It is well suited as a reference book for both undergraduate and graduate courses on information security approaches, the Internet of Things, and real-world intelligent applications.

Classification and Clustering in Biomedical Signal Processing - Dey,

Nilanjan 2016-04-07

Advanced techniques in image processing have led to many innovations supporting the medical field, especially in the area of disease diagnosis.

Biomedical imaging is an essential part of early disease detection and often considered a first step in the proper management of medical pathological conditions.

Classification and Clustering in Biomedical Signal Processing focuses on existing and proposed methods for medical imaging, signal processing, and analysis for the purposes of diagnosing and monitoring patient conditions. Featuring the most recent empirical

research findings in the areas of signal processing for biomedical applications with an emphasis on classification and clustering techniques, this essential publication is designed for use by medical professionals, IT developers, and advanced-level graduate students.

Information Technology and Intelligent Transportation Systems - L.C. Jain 2020-03-18

Intelligent transport systems, from basic management systems to more application-oriented systems, vary in the technologies they apply. Information technologies, including wireless communication, are important in intelligent transportation systems, as are computational technologies: floating car data/floating cellular data, sensing technologies, and video vehicle detection. Theoretical and application technologies, such as emergency vehicle notification systems, automatic road enforcement and collision avoidance systems, as well as some cooperative systems are also used in intelligent

transportation systems. This book presents papers selected from the 128 submissions in the field of information technology and intelligent transportation systems received from 5 countries. In December 2019 Chang'an University organized a round-table meeting to discuss and score the technical merits of each selected paper, of which 23 are included in this book. Providing a current overview of the subject, the book will be of interest to all those working in the field of intelligent transportation systems and traffic management.

Epidemiological Research Applications for Public Health Measurement and Intervention

- Taukeni, Simon George
2021-01-22

Different levels in health sciences, in particular public health, have acknowledged the significant role of epidemiology methods for early detection of emerging infections, alert systems, and preparedness interventions. Therefore, it is important to understand how epidemiological research is

conducted and how it can be used at various levels to make exposure or incidence data on a general population available. In this, epidemiological research connected to both human and technology interactions is of primary importance. Epidemiological Research Applications for Public Health Measurement and Intervention provides relevant theoretical frameworks and the latest empirical research findings in the field of epidemiology. The chapters within this essential reference source enhance the knowledge of epidemiological research and measurement to investigate, detect, and monitor emerging pathological infections. While highlighting topics that include the history of epidemiology; the applications of epidemiology; and also the uses, principles, and roles of epidemiology, this book is ideally intended for professionals and researchers working in the field of health sciences in various disciplines and government officials, policymakers, practitioners,

stakeholders, researchers, academicians, and students who are interested in epidemiological research and measurement for increasing the effectiveness of public health practice.

Clinical Costing Techniques and Analysis in Modern Healthcare Systems - Ma,

Ronald 2018-07-20

Hospital funding plays an important role in strengthening healthcare and medical resources. Utilizing comprehensive costing systems to accommodate clinical and financial data leads to improved patient care both clinically and financially.

Clinical Costing Techniques and Analysis in Modern Healthcare Systems provides innovative insights into the connections between statistical information and financial systems within clinical settings. The content within this publication delves into business intelligence, clinical decision making, and electronic health records. It is geared towards medical practitioners and professionals, hospital

administrators, and researchers seeking valuable insights centered on clinical variations of healthcare data as well as the role of information systems in linking productivity and performance management.

Handbook of Computational Intelligence in Biomedical Engineering and Healthcare -

Janmenjoy Nayak 2021-04-08

Handbook of Computational Intelligence in Biomedical Engineering and Healthcare helps readers analyze and conduct advanced research in specialty healthcare applications surrounding oncology, genomics and genetic data, ontologies construction, bio-memetic systems, biomedical electronics, protein structure prediction, and biomedical data analysis. The book provides the reader with a comprehensive guide to advanced computational intelligence, spanning deep learning, fuzzy logic, connectionist systems, evolutionary computation, cellular automata, self-organizing systems, soft computing, and hybrid

intelligent systems in biomedical and healthcare applications. Sections focus on important biomedical engineering applications, including biosensors, enzyme immobilization techniques, immuno-assays, and nanomaterials for biosensors and other biomedical techniques. Other sections cover gene-based solutions and applications through computational intelligence techniques and the impact of nonlinear/unstructured data on experimental analysis. Presents a comprehensive handbook that covers an Introduction to Computational Intelligence in Biomedical Engineering and Healthcare, Computational Intelligence Techniques, and Advanced and Emerging Techniques in Computational Intelligence Helps readers analyze and do advanced research in specialty healthcare applications Includes links to websites, videos, articles and other online content to expand and support primary learning objectives

Biomedical Image Processing and Classification

Classification - Luca Mesin
2021-05-26

Biomedical image processing is an interdisciplinary field involving a variety of disciplines, e.g., electronics, computer science, physics, mathematics, physiology, and medicine. Several imaging techniques have been developed, providing many approaches to the study of the human body. Biomedical image processing is finding an increasing number of important applications in, for example, the study of the internal structure or function of an organ and the diagnosis or treatment of a disease. If associated with classification methods, it can support the development of computer-aided diagnosis (CAD) systems, which could help medical doctors in refining their clinical picture.

Data Science and Analytics - Brajendra Panda 2018-03-07

This book constitutes the refereed proceedings of the 4th International Conference on

Recent Developments in Science, Engineering and Technology, REDSET 2017, held in Gurgaon, India, in October 2017. The 66 revised full papers presented were carefully reviewed and selected from 329 submissions. The papers are organized in topical sections on big data analysis, data centric programming, next generation computing, social and web analytics, security in data science analytics.

Using Narrative Writing to Enhance Healing During and After Global Health Crises - Bird, Jennifer Lynne
2021-09-24

Millions of people experience stress in their lives, and this is even more prevalent in the aftermath of the COVID-19 pandemic. Whether this stress stems from a job loss or a fear of sickness from working with the public, stress has reigned throughout the pandemic. However, stress is more complicated than being simply a “bad feeling.” Stress can impact both mental and physical wellbeing. Using

Narrative Writing to Enhance Healing During and After Global Health Crises is a critical reference that discusses therapeutic writing and offers it as a simple solution for those who are at the highest risk of poor health. This book covers multiple writing narratives on diverse topics and how they aid with stress after the COVID-19 pandemic. Including topics such as anxiety, health coaching, and leadership, this book is essential for teachers, community leadership, physical and emotional therapists, healthcare workers, teachers, faculty of both K-12 and higher education, members of church communities, students, academicians, and any researchers interested in using writing as a healing process.

Medical Informatics and Bioimaging Using Artificial Intelligence - Aboul Ella Hassanien 2022

This book emphasizes the latest developments and achievements in artificial intelligence and related technologies, focusing on the

applications of artificial intelligence and medical diagnosis. The book describes the theory, applications, concept visualization, and critical surveys covering most aspects of AI for medical informatics.

Classification Techniques for Medical Image Analysis and Computer Aided

Diagnosis - Nilanjan Dey
2019-08-23

Classification Techniques for Medical Image Analysis and Computer Aided Diagnosis covers the most current advances on how to apply classification techniques to a wide variety of clinical applications that are appropriate for researchers and biomedical engineers in the areas of machine learning, deep learning, data analysis, data management and computer-aided diagnosis (CAD) systems design. The book covers several complex image classification problems using pattern recognition methods, including Artificial Neural Networks (ANN), Support Vector Machines

(SVM), Bayesian Networks (BN) and deep learning.

Further, numerous data mining techniques are discussed, as they have proven to be good classifiers for medical images. Examines the methodology of classification of medical images that covers the taxonomy of both supervised and unsupervised models, algorithms, applications and challenges Discusses recent advances in Artificial Neural Networks, machine learning, and deep learning in clinical applications Introduces several techniques for medical image processing and analysis for CAD systems design

Artificial Intelligence and Natural Algorithms - Rijwan Khan
2022-09-23

This book informs the reader about applications of Artificial Intelligence (AI) and nature-inspired algorithms in different situations. Each chapter in this book is written by topic experts on AI, nature-inspired algorithms and data science. The basic concepts relevant to these topics are explained, including evolutionary

computing (EC), artificial neural networks (ANN), swarm intelligence (SI), and fuzzy systems (FS). Additionally, the book also covers optimization algorithms for data analysis. The contents include algorithms that can be used in systems designed for plant science research, load balancing, environmental analysis and healthcare. The goal of the book is to equip the reader - students and data analysts - with the information needed to apply basic AI algorithms to resolve actual problems encountered in a professional environment.

Biomedical Image Analysis and Mining Techniques for Improved Health Outcomes -

Wahiba Ben Abdesslem Karâa
2015-10-01

Every second, users produce large amounts of image data from medical and satellite imaging systems. Image mining techniques that are capable of extracting useful information from image data are becoming increasingly useful, especially in medicine and the health sciences. Biomedical Image

Analysis and Mining Techniques for Improved Health Outcomes addresses major techniques regarding image processing as a tool for disease identification and diagnosis, as well as treatment recommendation. Highlighting current research intended to advance the medical field, this publication is essential for use by researchers, advanced-level students, academicians, medical professionals, and technology developers. An essential addition to the reference material available in the field of medicine, this timely publication covers a range of applied research on data mining, image processing, computational simulation, data visualization, and image retrieval.

Data Mining in Biomedical Imaging, Signaling, and Systems - Sumeet Dua

2016-04-19

Data mining can help pinpoint hidden information in medical data and accurately differentiate pathological from normal data. It can help to extract hidden features from

patient groups and disease states and can aid in automated decision making. Data Mining in Biomedical Imaging, Signaling, and Systems provides an in-depth examination of the biomed

Computational Retinal Image Analysis - Emanuele Trucco 2019-11-25

Computational Retinal Image Analysis: Tools, Applications and Perspectives gives an overview of contemporary retinal image analysis (RIA) in the context of healthcare informatics and artificial intelligence. Specifically, it provides a history of the field, the clinical motivation for RIA, technical foundations (image acquisition modalities, instruments), computational techniques for essential operations, lesion detection (e.g. optic disc in glaucoma, microaneurysms in diabetes) and validation, as well as insights into current investigations drawing from artificial intelligence and big data. This comprehensive reference is ideal for researchers and graduate

students in retinal image analysis, computational ophthalmology, artificial intelligence, biomedical engineering, health informatics, and more. Provides a unique, well-structured and integrated overview of retinal image analysis Gives insights into future areas, such as large-scale screening programs, precision medicine, and computer-assisted eye care Includes plans and aspirations of companies and professional bodies

Computational Models for Biomedical Reasoning and Problem Solving - Chen, Chung-Hao 2019-04-12

The results of computational model simulations allow researchers and clinicians to make predictions about what will happen in the biological systems that are being studied in response to changing conditions for a disease or disorder. With a well-developed computational model, researchers and clinicians can better understand the cause of a disease or a disorder and

predict treatment results. Computational Models for Biomedical Reasoning and Problem Solving is a critical scholarly publication that provides insightful strategies to developing computational models that allow for the better understanding and treatment of various diseases and disorders. Featuring topics such as biomedicine, neuroscience, and artificial intelligence, this book is ideal for practitioners, clinicians, researchers, psychologists, and engineers.

Deep Learning for Medical Image Analysis - S. Kevin Zhou 2017-01-18

Deep learning is providing exciting solutions for medical image analysis problems and is seen as a key method for future applications. This book gives a clear understanding of the principles and methods of neural network and deep learning concepts, showing how the algorithms that integrate deep learning as a core component have been applied to medical image detection, segmentation and

registration, and computer-aided analysis, using a wide variety of application areas. Deep Learning for Medical Image Analysis is a great learning resource for academic and industry researchers in medical imaging analysis, and for graduate students taking courses on machine learning and deep learning for computer vision and medical image computing and analysis. Covers common research problems in medical image analysis and their challenges Describes deep learning methods and the theories behind approaches for medical image analysis Teaches how algorithms are applied to a broad range of application areas, including Chest X-ray, breast CAD, lung and chest, microscopy and pathology, etc. Includes a Foreword written by Nicholas Ayache

Medical Big Data and Internet of Medical Things - Aboul Ella Hassanien 2018-10-25

Big data and the Internet of Things (IoT) play a vital role in prediction systems used in biological and medical

applications, particularly for resolving issues related to disease biology at different scales. Modelling and integrating medical big data with the IoT helps in building effective prediction systems for automatic recommendations of diagnosis and treatment. The ability to mine, process, analyse, characterize, classify and cluster a variety and wide volume of medical data is a challenging task. There is a great demand for the design and development of methods dealing with capturing and automatically analysing medical data from imaging systems and IoT sensors. Addressing analytical and legal issues, and research on integration of big data analytics with respect to clinical practice and clinical utility, architectures and clustering techniques for IoT data processing, effective frameworks for removal of misclassified instances, practicality of big data analytics, methodological and technical issues, potential of Hadoop in managing

healthcare data is the need of the hour. This book integrates different aspects used in the field of healthcare such as big data, IoT, soft computing, machine learning, augmented reality, organs on chip, personalized drugs, implantable electronics, integration of bio-interfaces, and wearable sensors, devices, practical body area network (BAN) and architectures of web systems. Key Features:

- Addresses various applications of Medical Big Data and Internet of Medical Things in real time environment
- Highlights recent innovations, designs, developments and topics of interest in machine learning techniques for classification of medical data
- Provides background and solutions to existing challenges in Medical Big Data and Internet of Medical Things
- Provides optimization techniques and programming models to parallelize the computationally intensive tasks in data mining of medical data
- Discusses interactions, advantages, limitations,

challenges and future perspectives of IoT based remote healthcare monitoring systems. Includes data privacy and security analysis of cryptography methods for the Web of Medical Things (WoMT) Presents case studies on the next generation medical chair, electronic nose and pill cam are also presented.

Biomedical Data Mining for Information Retrieval -

Subhendu Kumar Pani
2021-08-06

This book comprehensively covers the topic of mining biomedical text, images and visual features towards information retrieval. Biomedical and Health Informatics is an emerging field of research at the intersection of information science, computer science, and health care and brings tremendous opportunities and challenges due to easily available and abundant biomedical data for further analysis. The aim of healthcare informatics is to ensure the high-quality, efficient healthcare, better treatment

and quality of life by analyzing biomedical and healthcare data including patient's data, electronic health records (EHRs) and lifestyle. Previously it was a common requirement to have a domain expert to develop a model for biomedical or healthcare; however, recent advancements in representation learning algorithms allows us to automatically to develop the model. Biomedical Image Mining, a novel research area, due to its large amount of biomedical images increasingly generates and stores digitally. These images are mainly in the form of computed tomography (CT), X-ray, nuclear medicine imaging (PET, SPECT), magnetic resonance imaging (MRI) and ultrasound. Patients' biomedical images can be digitized using data mining techniques and may help in answering several important and critical questions related to health care. Image mining in medicine can help to uncover new relationships between data and reveal new useful information that can be helpful

for doctors in treating their patients.

Machine Learning and AI Techniques in Interactive Medical Image Analysis -

Panigrahi, Lipismita
2022-09-16

The healthcare industry is predominantly moving towards affordable, accessible, and quality health care. All organizations are striving to build communication compatibility among the wide range of devices that have operated independently. Recent developments in electronic devices have boosted the research in the medical imaging field. It incorporates several medical imaging techniques and achieves an important goal for health improvement all over the world. Despite the significant advances in high-resolution medical instruments, physicians cannot always obtain the full amount of information directly from the equipment outputs, and a large amount of data cannot be easily exploited without a computer. Machine Learning

and AI Techniques in Interactive Medical Image Analysis discusses how clinical efficiency can be improved by investigating the different types of intelligent techniques and systems to get more reliable and accurate diagnostic conclusions. This book further introduces segmentation techniques to locate suspicious areas in medical images and increase the segmentation accuracy. Covering topics such as computer-aided detection, intelligent techniques, and machine learning, this premier reference source is a dynamic resource for IT specialists, computer scientists, diagnosticians, imaging specialists, medical professionals, hospital administrators, medical students, medical technicians, librarians, researchers, and academicians.

Futuristic Design and Intelligent Computational Techniques in Neuroscience and Neuroengineering -

Singh, Harjit Pal 2022-01-07

Each day, novel neuroscientific

findings show that researchers are focusing on developing advanced smart hardware designs and intelligent computational models to imitate the human brain's computational abilities. The advancements in smart materials provide a significant role in inventing intelligent bioelectronic device designs with smart features such as accuracy, low power consumption, and more. These advanced and intelligent computing models through machine and smart deep learning algorithms help to understand the information processing capabilities of the human brain with optimum accuracy. Futuristic Design and Intelligent Computational Techniques in Neuroscience and Neuroengineering highlights advanced computational models and hardware designs in neurology and integration of mathematical physical, biological, chemical, and engineering models to mimic brain functions; discovers new technological diagnosis

techniques; and achieves high accuracy in learning models to better understand the functioning of the human brain. Providing rich information on brain-computer interfacing, gamification in children, and vestibular rehabilitation, this text acts as an essential resource for experts in electrophysiological studies, neurologists, neuro-physiotherapists, neuro-radiologists, intelligent system developers, bio-software and hardware developers, neuro database collectors, electro-physiologists, professors associated with neurology, psychiatrists, engineers, scientists, and students from academia and industry involved in interdisciplinary approaches to neurology.

Predictive Modeling in Biomedical Data Mining and Analysis - Sudipta Roy

2022-08-28

Predictive Modeling in Biomedical Data Mining and Analysis presents major technical advancements and research findings in the field of machine learning in biomedical

image and data analysis. The book examines recent technologies and studies in preclinical and clinical practice in computational intelligence. The authors present leading-edge research in the science of processing, analyzing and utilizing all aspects of advanced computational machine learning in biomedical image and data analysis. As the application of machine learning is spreading to a variety of biomedical problems, including automatic image segmentation, image classification, disease classification, fundamental biological processes, and treatments, this is an ideal reference. Machine Learning techniques are used as predictive models for many types of applications, including biomedical applications. These techniques have shown impressive results across a variety of domains in biomedical engineering research. Biology and medicine are data-rich disciplines, but the data are complex and often ill-understood, hence the need for new resources and

information. Includes predictive modeling algorithms for both Supervised Learning and Unsupervised Learning for medical diagnosis, data summarization and pattern identification Offers complete coverage of predictive modeling in biomedical applications, including data visualization, information retrieval, data mining, image pre-processing and segmentation, mathematical models and deep neural networks Provides readers with leading-edge coverage of biomedical data processing, including high dimension data, data reduction, clinical decision-making, deep machine learning in large data sets, multimodal, multi-task, and transfer learning, as well as machine learning with Internet of Biomedical Things applications
Biomedical Image Analysis and Mining Techniques for Improved Health Outcomes - Karâa, Wahiba Ben Abdesslem 2015-11-03
Every second, users produce large amounts of image data

from medical and satellite imaging systems. Image mining techniques that are capable of extracting useful information from image data are becoming increasingly useful, especially in medicine and the health sciences. Biomedical Image Analysis and Mining Techniques for Improved Health Outcomes addresses major techniques regarding image processing as a tool for disease identification and diagnosis, as well as treatment recommendation. Highlighting current research intended to advance the medical field, this publication is essential for use by researchers, advanced-level students, academicians, medical professionals, and technology developers. An essential addition to the reference material available in the field of medicine, this timely publication covers a range of applied research on data mining, image processing, computational simulation, data visualization, and image retrieval.

Mining Multimedia Documents - Wahiba Ben

Abdessalem Karaa 2017-04-21
The information age has led to an explosion in the amount of information available to the individual and the means by which it is accessed, stored, viewed, and transferred. In particular, the growth of the internet has led to the creation of huge repositories of multimedia documents in a diverse range of scientific and professional fields, as well as the tools to extract useful knowledge from them. Mining Multimedia Documents is a must-read for researchers, practitioners, and students working at the intersection of data mining and multimedia applications. It investigates various techniques related to mining multimedia documents based on text, image, and video features. It provides an insight into the open research problems benefitting advanced undergraduates, graduate students, researchers, scientists and practitioners in the fields of medicine, biology, production, education, government, national security and economics.

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.

Optimizing Medical Education With Instructional Technology -
Demiroz, Erdem 2018-11-30

In today's educational settings, infusing technology into educational practices is not optional. It is a necessity because of the changing expectations and needs of learners. In a fast-paced

environment such as the medical profession, it is critical that future healthcare professionals have access to the most advanced training environments and resources. *Optimizing Medical Education With Instructional Technology* is an essential reference that reports on technology-supported medical education. It introduces the best practices in 21st century learning approaches. This book, in addition to looking at medical education through the lens of instructional technologies, features research on topics such as the ethics of online education, mentoring research, and technology in the clinical setting. This book is designed for medical educators, instructional designers, researchers, practitioners, and academicians.

Advances in Computational Techniques for Biomedical Image Analysis - Deepika Koundal 2020-05-28

Advances in Computational Techniques for Biomedical Image Analysis: Methods and Applications focuses on post-

acquisition challenges such as image enhancement, detection of edges and objects, analysis of shape, quantification of texture and sharpness, and pattern analysis. It discusses the archiving and transfer of images, presents a selection of techniques for the enhancement of contrast and edges, for noise reduction and for edge-preserving smoothing. It examines various feature detection and segmentation techniques, together with methods for computing a registration or normalization transformation. *Advances in Computational Techniques for Biomedical Image Analysis: Method and Applications* is ideal for researchers and post graduate students developing systems and tools for health-care systems. Covers various challenges and common research issues related to biomedical image analysis. Describes advanced computational approaches for biomedical image analysis. Shows how algorithms are applied to a broad range of application areas, including

Chest X-ray, breast CAD, lung and chest, microscopy and pathology, etc. Explores a range of computational algorithms and techniques, such as neural networks, fuzzy sets, and evolutionary optimization Explores cloud based medical imaging together with medical imaging security and forensics

Medical Imaging: Concepts, Methodologies, Tools, and Applications

- Management Association, Information Resources 2016-07-18

Medical imaging has transformed the ways in which various conditions, injuries, and diseases are identified, monitored, and treated. As various types of digital visual representations continue to advance and improve, new opportunities for their use in medical practice will likewise evolve. Medical Imaging: Concepts, Methodologies, Tools, and Applications presents a compendium of research on digital imaging technologies in a variety of healthcare settings. This multi-volume work contains practical

examples of implementation, emerging trends, case studies, and technological innovations essential for using imaging technologies for making medical decisions. This comprehensive publication is an essential resource for medical practitioners, digital imaging technologists, researchers, and medical students.

Computational Tools and Techniques for Biomedical Signal Processing - Singh, Butta 2016-08-12

Biomedical signal processing in the medical field has helped optimize patient care and diagnosis within medical facilities. As technology in this area continues to advance, it has become imperative to evaluate other ways these computation techniques could be implemented.

Computational Tools and Techniques for Biomedical Signal Processing investigates high-performance computing techniques being utilized in hospital information systems. Featuring comprehensive coverage on various theoretical

perspectives, best practices, and emergent research in the field, this book is ideally suited for computer scientists, information technologists,

biomedical engineers, data-processing specialists, and medical physicists interested in signal processing within medical systems and facilities.