Brain Tumor Detection In Medical Imaging Using Matlab | 0dbd8126bd1901a991ef3822b576758


Dr. Ahmet Mesur Halefoglu mostly deals with research fields in body imaging and neuroradiology with multidetector computed tomography and high-resolution magnetic resonance imaging. He has served as postdoctoral research fellow at Johns Hopkins Hospital. Currently, he is working as an associate professor of radiology in Istanbul, Turkey. He has more than 50 high-impact-factor publications and has written 3 books. He is a member of Turkish Society of Radiology and European Society of Radiology. During the recent years, there have been many breakthroughs in MRI due to developments in scanner technology and pulse sequencing. These important achievements have led to remarkable improvements in neuroimaging and advanced techniques, including diffusion imaging, diffusion tensor imaging, perfusion imaging, magnetic resonance spectroscopy, and functional MRI. These advanced neuroimaging techniques have enabled us to achieve invaluable insights into tissue microstructure, microvasculature, metabolism, and brain connectivity.

Medical image processing and its segmentation is an active and interesting area for researchers. It has reached at the tremendous place in diagnosing tumors after the discovery of CT and MRI. MRI is an useful tool to detect the brain tumor and segmentation is performed to carry out the useful portion from an image. The purpose of this paper is to provide an overview of different image segmentation methods like watershed algorithm, morphological operations, neutrosophic sets, thresholding, K-means clustering, fuzzy C-means etc using MRI images.

This eighth volume in the series Methods of Cancer Imaging Therapy, and Prognosis discusses in detail the classification of the CNS tumors as well as brain tumor imaging. Scientists and Clinicians have contributed state of the art chapters on their respective areas of expertise, providing the reader a whole field view of the CNS tumors and brain tumor imaging in Europe. This fully illustrated volume: Explains the genetics of malignant brain tumors and gene amplification using quantitative-PCR; Presents a large number of standard and new imaging modalities, including magnetic resonance imaging, functional magnetic resonance imaging, diffusion tensor imaging, amide proton transfer imaging, positron emission tomography, single photon emission computed tomography, magnetic resonance single voxel spectroscopy and intraoperative ultrasound imaging, for staging and diagnosing various primary and secondary brain cancers; Explains the usefulness of image processing methods for planning and monitoring (assessment) therapy for cancers; Discusses diagnosis and treatment of primary CNS lymphomas, CNS atypical teratoid/habidoid and CNS Rosai-Dorfman disease; Includes the subject of translational medicine. Professor Hayat has summarized the problems associated with the complexities of research publications and has been successful in editing a must-read volume for oncologists, cancer researchers, medical teachers and students of cancer biology.

This book constitutes the refereed proceedings of the 21st Annual Conference on Medical Image Understanding and Analysis, MIUA 2017, held in Edinburgh, UK, in July 2017. The 82 revised full papers presented were carefully reviewed and selected from 105 submissions. The papers are organized in topical sections on retinal imaging, ultrasound imaging, cardiovascular imaging, oncology imaging, mammography image analysis, image enhancement and alignment, modeling and segmentation of preclinical, body and histological imaging, feature detection and classification. The chapters 'Model-Based Correction of Segmentation Errors in 3D Digital Histological Images' and 'Unsupervised Superpixel-Based Segmentation of Histopathological Images with Consensus Clustering' are open access under a CC BY 4.0 license.

The field of healthcare is seeing a rapid expansion of technological advancement within current medical practices. The implementation of technologies including intelligent systems, multi-model imaging, genetic algorithms, and soft computing are assisting in predicting and identifying diseases, diagnosing cancer, and the examination of cells. Implementing these biomedical technologies remains a challenge for hospitals worldwide, creating a need for research on the specific applications of these computational techniques. Deep Neural Networks for Multimodal Imaging and Biomedical Applications provides research exploring the theoretical and practical aspects of emerging data computing methods and imaging techniques within healthcare and biomedicine. The publication provides a complete set of information in a single module starting from developing deep neural networks to predicting disease by employing multi-modal imaging. Featuring coverage on a broad range of topics such as prediction models, edge computing, and quantitative measurements, this book is ideally designed for researchers, academicians, physicians, IT consultants, medical software developers, practitioners, policymakers, scholars, and students seeking current research on biomedical advancements and developing computational methods in healthcare.

“This book examines the application of artificial intelligence in medical imaging diagnostics”--

Neutrosophic Set in Medical Image Analysis gives an understanding of the concepts of NS, along with knowledge on how to gather, interpret, analyze and handle medical images using NS methods. It presents the latest cutting-edge research that gives insight into neutrosophic set’s novel techniques, strategies and challenges, showing how it can be used in biomedical diagnoses systems. The neutrosophic set (NS), which is a generalization of fuzzy set, offers the prospect of overcoming the restrictions of fuzzy-based approaches to medical image analysis. Introduces the mathematical model and concepts of neutrosophic theory and methods Highlights the different techniques of neutrosophic theory, focusing on applying the neutrosophic set in image analysis to support computer-aided diagnosis (CAD) systems, including approaches from soft computing and machine learning Shows how NS techniques can be applied to
medical image denoising, segmentation and classification Provides challenges and future directions in neutrosophic set based medical image analysis

A must-have reference, this new edition provides practical information on treatment guidelines, details of diagnosis and therapy, and personal recommendations on patient management from experts in the field. Consistently formatted chapters allow for a user-friendly presentation for quick access of key information by the practicing clinician. Completely updated, this new edition includes all of the latest developments in treatment strategies of medical, surgical and radiation oncologists.

Handbook of Medical Image Computing and Computer-Assisted Intervention presents important advanced methods and state-of-the-art research in medical image computing and computer-assisted intervention, providing a comprehensive reference on current technical approaches and solutions, while also offering proven algorithms for a variety of essential medical imaging applications. This book is written primarily for university researchers, graduate students and professional practitioners (assuming an elementary level of linear algebra, probability and statistics, and signal processing) working on medical image computing and computer-assisted intervention. This book presents the key research challenges in medical image computing and computer-assisted intervention. It is written by leading authorities of the Medical Image Computing and Computer Assisted Intervention (MICCAI) Society. This book contains state-of-the-art technical approaches to key challenges. Demonstrates proven algorithms for a wide range of essential medical imaging applications. Includes source codes for use in a plug-and-play manner. Embraces future directions in the fields of medical image computing and computer-assisted intervention.

This book describes the basics, the challenges and the limitations of state-of-the-art brain tumor imaging and examines in detail its impact on diagnosis and treatment monitoring. It opens with an introduction to the clinically relevant physical principles of brain imaging. Since MR methodology plays a crucial role in brain imaging, the fundamental aspects of MR spectroscopy, MR perfusion and diffusion-weighted MR methods are described, focusing on the specific demands of brain tumor imaging. The potential and the limits of new imaging methodology are carefully addressed and compared to conventional MR imaging. In the main part of the book, the most important imaging criteria for the differential diagnosis of solid and necrotic brain tumors are delineated and illustrated in examples. A closing section is devoted to the use of MR methods for the monitoring of brain tumor therapy. The book is intended for radiologists, neurologists, neurosurgeons, oncolists and other scientists in the biomedical field with an interest in neuro-oncology.

Brain tumor classification is a challenging task in the field of medical image processing. The present study proposes a hybrid method using Neutrosophy and Convolutional Neural Network (NS-CNN). It aims to classify tumor regions that are segmented from brain images as benign and malignant. In the first stage, MRI images were segmented using the neutrosophic set – expert maximum fuzzy-sure entropy (NS-EMPSE) approach.

ICSSIT 2018 will provide an outstanding international forum for sharing knowledge and results in all fields of science, engineering and Technology. ICSSIT provides quality key experts who provide an opportunity in bringing up innovative ideas. Recent updates in the in the field of technology will be a platform for the upcoming researchers. The conference will be Complete, Concise, Clear and Cohesive in terms of research related to Smart Systems and Technology.

The most recent developments in diagnostic and therapeutic aspects of Gliomas (glioblastoma) in the brain are presented. The importance of personalized medicine and clinical validation for targeted therapy are discussed. The identification of various types of biomarkers (determined by molecular genetics) is included, along with their advantages and limitations as markers in tumor detection and diagnosis. The identification and validation of brain cancer (glioblastoma) genes are discussed. The role of cancer stem cells in the initiation and persistence of malignant gliomas is explained; response of glioblastoma cancer stem cells to various growth factors, such as epidermal growth factor receptor kinase inhibitor, is explained. The use of surgical resection, chemotherapy (e.g., temozolomide), immunotherapy, and radiation therapy for glioblastoma patients is included. Biological impediments for chemotherapy and radiotherapy for malignant glioblastoma are pointed out. Standard (established) as well as newer imaging modalities (proton magnetic resonance spectroscopy) are discussed. Also included are proton magnetic resonance spectroscopy in intracranial gliomas, and the use of proton magnetic spectroscopic imaging in determining the infiltration zone in gliomas. The role of molecular signaling in the CNS cancer development is explained, including cell death signaling in glioblastoma multiforme. The most recent developments in diagnostic and therapeutic aspects of Gliomas (glioblastoma) in the brain are presented. The importance of personalized medicine and clinical validation for targeted therapy are discussed. The identification of various types of biomarkers (determined by molecular genetics) is included, along with their advantages and limitations as markers in tumor detection and diagnosis. The identification and validation of brain cancer (glioblastoma) genes are discussed. The role of cancer stem cells in the initiation and persistence of malignant gliomas is explained; response of glioblastoma cancer stem cells to various growth factors, such as epidermal growth factor receptor kinase inhibitor, is explained. The use of surgical resection, chemotherapy (e.g., temozolomide), immunotherapy, and radiation therapy for glioblastoma patients is included. Biological impediments for chemotherapy and radiotherapy for malignant glioblastoma are pointed out. Standard (established) as well as newer imaging modalities (proton magnetic resonance spectroscopy) are discussed. Also included are proton magnetic resonance spectroscopy in intracranial gliomas, and the use of proton magnetic spectroscopic imaging in determining the infiltration zone in gliomas. The role of molecular signaling in the CNS cancer development is explained, including cell death signaling in glioblastoma multiforme.

Medical imaging is one of the heaviest funded biomedical engineering research areas. The second edition of Pattern Recognition and Signal Analysis in Medical Imaging brings sharp focus to the development of integrated systems for use in the clinical sector, enabling both imaging and the automatic assessment of the resultant data. Since the first edition, there has been tremendous development of new, powerful technologies for detecting, storing, transmitting, analyzing, and displaying medical images. Computer-aided analytical techniques, coupled with a continuing need to derive more information from medical images, has led to a growing application of digital processing techniques in cancer detection as well as elsewhere in medicine. This book is an essential tool for students and professionals, compiling and explaining proven and cutting-edge methods in pattern recognition for medical imaging. New edition has been expanded to cover signal analysis, which was only superficially covered in the first edition. New chapters cover Cluster Validity Techniques, Computer-Aided Diagnosis Systems in Breast MRI, Spatio-Temporal Models in Functional, Contrast-Enhanced and Perfusion Cardiovascular MRI. Gives readers an unparalleled insight into the latest pattern recognition and signal analysis technologies, modeling, and applications.

Brain Tumor MRI Image Segmentation Using Deep Learning Techniques offers a description of deep learning approaches used for the segmentation of brain tumors. The book demonstrates core concepts of deep learning algorithms by using diagrams, data tables and examples to illustrate brain tumor segmentation. After introducing basic concepts of deep learning-based brain tumor segmentation, sections cover techniques for modeling, segmentation and properties. A focus is placed on the application of different types of convolutional neural networks, like single path, multi path, fully convolutional network, cascade convolutional neural networks, Long Short-Term Memory - Recurrent Neural Network and Gated Recurrent Units, and more. The book also highlights how the use of deep neural networks can address new questions and protocols, as well as improve upon existing challenges in brain tumor segmentation. Provides readers with an understanding of deep learning-based approaches in the field of brain tumor segmentation, including preprocessing techniques integrates recent advancements in the field, including the transformation of low-resolution brain tumor images into super-resolution images using deep learning-based methods, single path Convolutional Neural Network based brain tumor segmentation, and much more. Includes coverage of Long Short-Term
Memory (LSTM) based Recurrent Neural Network (RNN), Gated Recurrent Units (GRU) based Recurrent Neural Network (RNN), Generative Adversarial Networks (GAN), Auto Encoder based brain tumor segmentation, and Ensemble deep learning Model based brain tumor segmentation Covers research issues and the future of deep learning-based brain tumor segmentation

The book discusses the impact of machine learning and computational intelligent algorithms on medical image data processing, and introduces the latest trends in machine learning technologies and computational intelligence for intelligent medical image analysis. The topics covered include automated region of interest detection of magnetic resonance images based on center of gravity; brain tumor detection through low-level features detection; automatic MRI image segmentation for brain tumor detection using the multi-level sigmoid activation function; and computer-aided detection of mammographic lesions using convolutional neural networks.

Medical imaging has transformed the ways in which various conditions, diseases, and injuries 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.

This book presents a comprehensive overview of current state-of-the-art clinical physiological imaging of brain tumors. It focuses on the application of various modalities that are relevant to brain tumor imaging, including such as blood oxygen level dependent functional magnetic resonance imaging, diffusion tensor imaging, magnetic source imaging/magnetoecephalography, magnetic resonance perfusion imaging, magnetic resonance spectroscopic imaging, amide proton transfer imaging, high angular resolution diffusion imaging, and molecular imaging. Featuring contributions from renowned experts in functional imaging, this book examines the diagnosis and characterization of brain tumors, details the application of functional imaging to treatment planning and monitoring of therapeutic intervention, and explores future directions in physiologic brain tumor imaging. Intended for neurooncologists, neurosurgeons, neuroradiologists, residents, and medical students, Functional Imaging of Brain Tumors is a unique resource that serves to advance patient care and research in this rapidly developing field.

Despite the availability of many effective treatments, there remains a therapeutic nihilism associated with brain tumors. This highly readable second edition of 'Fast Facts: Brain Tumors' challenges this view, starting from the premise that patients with brain tumors can truly benefit from a thoughtful multidisciplinary approach. This comprehensive handbook covers all the salient features of the various brain tumors and treatment modalities in a way that will be useful to the practicing clinician. • Advances in radiology and pathology that have led to more precise and detailed diagnoses • Developments in molecular biology and imaging techniques that have improved available diagnostic modalities • New neurosurgical techniques that have enabled operations on tumors that were previously considered inoperable • Novel delivery systems that allow various treatments to reach tumors that are otherwise protected by the blood-brain barrier. This fully updated edition of 'Fast Facts: Brain Tumors' bridges the gap between primary care providers - whose role is pivotal in tumor detection and subsequent patient care - and first-level specialists such as general neurologists and neurosurgeons. Its key message is that selection of the best initial approach for an individual patient will result in the best overall outcome, both in terms of survival and quality of life. 'Fast Facts: Brain Tumors' is specifically for the primary care physician whose role is pivotal in tumor detection and subsequent patient care. Contents: • Classification and epidemiology • Diagnosis • Treatment • Brain metastases • Gliomas • Meningiomas • Neuronal tumors • Pineal region tumors • Skull base tumors • Primary central nervous system lymphoma • Brain tumor syndromes and tumor-like cysts • Geriatric neuro-oncology • Useful resources

"Provides a current review of computer processing algorithms for the identification of lesions, abnormal masses, cancer, and disease in medical images. Presents useful examples from numerous imaging modalities for increased recognition of anomalies in MRI, CT, SPECT and digital/film X-Ray."
Cancer is a dense and an abnormal rapid multiplication (proliferation) of cells in the tissues of the human body. The brain tumor is one of the most dangerous and deadly tumors. Fortunately, the evolution of science has allowed us to create very efficient medical imaging techniques in order to discover this type of cancer. Chief among these techniques is magnetic resonance imaging (MRI) which is a very efficient technique compared to ultrasound. In this work, we are interested in the detection of this type of cancer allowing a three-dimensional (3D) reconstruction of MRI images. The segmentation methods used are based primarily on the Fuzzy C-Means algorithm that classifies and isolates parts of the brain tissue, and secondly on Distance Regularized Level Set Evolution technique for tumor detection. The obtained results show the effectiveness of this approach to detect brain tumor. The 3D reconstruction is finally carried out to better visualize the tumor as a whole and to detect its expansion. It is conducted using an indirect volume rendering method, which is the Marching Cubes algorithm.

The conventional method in medicine for brain MRI images classification and tumor detection is by human inspection. Operator-assisted classification methods are impractical for large amounts of data and are also non-reproducible. MRI images also always contain a noise caused by operator performance which can lead to serious inaccuracies classification. The use of artificial intelligent techniques, for instance, neural networks, fuzzy logic, neuro fuzzy have shown great potential in this field. Hence, in this project the neuro fuzzy system or ANFIS was applied for classification and detection purposes. Decision making was performed in two stages: feature extraction using the principal component analysis (PCA) and the ANFIS trained with the backpropagation gradient descent method in combination with the least squares method. The performance of the ANFIS classifier was evaluated in terms of training performance and classification accuracies and the results confirmed that the proposed ANFIS classifier has potential in detecting the tumors.

Recent advancements in the technology of medical imaging, such as CT and MRI scanners, are making it possible to create more detailed 3D and 4D images. These powerful images require vast amounts of digital data to help with the diagnosis of the patient. Artificial intelligence (AI) must play a vital role in supporting the use of this medical imaging data, which will only be viable as long as healthcare professionals and AI interact to embrace deep thinking platforms such as automation in the identification of diseases in patients. AI Innovation in Medical Imaging Diagnostics is an essential reference source that examines AI applications in medical imaging that can transform hospitals to become more efficient in the management of patient treatment plans through the production of faster imaging and the reduction of radiation dosages through the PET and SPECT imaging modalities. The book also explores how data clusters from these images can be translated into small data packages that can be accessed by healthcare departments to give a real-time insight into patient care and required interventions. Featuring research on topics such as assistive healthcare, cancer detection, and machine learning, this book is ideally designed for healthcare administrators, radiologists, data analysts, computer science professionals, medical imaging specialists, medical professionals, researchers, and students.

The book presents research that contributes to the development of intelligent dialog systems to simplify diverse aspects of everyday life, such as medical diagnosis and entertainment. Covering major thematic areas: machine learning and artificial neural networks; algorithms and models; and social and biometric data for applications in human-computer interfaces, it discusses processing of audio-visual signals for the detection of user-perceived states, the latest scientific discoveries in processing verbal (lexicon, syntax, and pragmatics), auditory (voice, intonation, vocal expressions) and visual signals (gestures, body language, facial expressions), as well as algorithms for detecting communication disorders, remote health-status monitoring, sentiment and affect analysis, social behaviors and engagement. Further, it examines neural and machine learning algorithms for the implementation of advanced telecommunication systems, communication with people with special needs, emotion modulation by computer contents, advanced sensors for tracking changes in real-life and automatic systems, as well as the development of advanced human-computer interfaces. The book does not focus on solving a particular problem, but instead describes the results of research that has positive effects in different fields and applications.

Recent years have witnessed the deployment of ever expanding range of digital electronics and communication technologies to enable innovative opportunities for meeting the demands posed by both economy and society. The increasing computing and communication technologies and the widespread availability of electronics and wireless networking technologies have lowered the traditional barriers of science and technology by processing large amounts of data and also enhancing its accessibility and exchangeability. Henceforth deploying new innovative technologies in this domain will even more strengthen the bond between the research and real time applications, which can further reshape the way people socialize and interact with each other.

Healthcare sector is characterized by difficulty, dynamism and variety. In 21st century, healthcare domain is surrounded by tons of challenges in terms of Disease detection, prevention, high costs, skilled technicians and better infrastructure. In order to handle these challenges, Intelligent Healthcare management technologies are required to play an effective role in improvising patient’s life. Healthcare organizations also need to continuously discover useful and actionable knowledge to gain insights from tons of data for various purposes of saving lives, reducing medical operations errors, enhancing efficiency, reducing costs and making the whole world a healthy world. Applying Swarm Intelligence and Evolutionary Algorithms in Healthcare and Drug Development is essential nowadays. The objective of this book is to highlight various Swarm Intelligence and Evolutionary Algorithms techniques for various medical issues in terms of Cancer Diagnosis, Brain Tumor, Diabetic Retinopathy, Heart disease as well as drug design and development. The book will act as one-stop reference for readers to think and explore Swarm Intelligence and Evolutionary Algorithms seriously for real-time patient diagnosis, as the book provides solutions to various complex diseases found critical for medical practitioners to diagnose in real-world. Key Features: Highlights the importance and applications of Swarm Intelligence and Evolutionary Algorithms in Healthcare industry. Elaborates Swarm Intelligence and Evolutionary Algorithms for Heart Disease detection and diagnosis. Comprehensive coverage of computational methodologies, approaches and techniques based on Swarm Intelligence and Evolutionary Algorithms for detecting Brain Tumour including deep learning to optimize brain tumor diagnosis. Provides a strong foundation for Diabetic Retinopathy detection using Swarm and Evolutionary algorithms. Focuses on applying Swarm Intelligence and Evolutionary Algorithms for Heart Disease detection and diagnosis. Comprehensively covers the role of Swarm Intelligence and Evolutionary Algorithms for Drug Design and Discovery. The book will play a significant role for Researchers, Medical Practitioners, Healthcare Professionals and Industrial Healthcare Research and Development wings to conduct advanced research in Healthcare using Swarm Intelligence and Evolutionary Algorithms techniques.

This volume presents the contributions of the fifth International Conference on Advancements of Medicine and Health Care through Technology (Meditech 2016), held in in Cluj-Napoka, Romania. The papers of this Proceedings volume present new developments in - Health Care Technology, - Medical Devices, Measurement and Instrumentation, - Medical Imaging, Image and Signal Processing, - Modeling and Simulation, - Molecular Bioengineering, - Biomechanics.

Magnetic resonance imaging (MRI) is widely used medical technology for diagnosis of various tissue abnormalities, detection of tumors. The active development in the computerized medical image segmentation has played a vital role in scientific research. This helps the doctors to take necessary treatment in an easy manner with fast decision making. Brain tumor segmentation is a hot point in the research field of Information technology with biomedical engineering.
The brain tumor segmentation is motivated by assessing tumor growth, treatment responses, computer-based surgery, treatment of radiation therapy, and developing tumor growth models. Therefore, computer-aided diagnostic system is meaningful in medical treatments to reducing the workload of doctors and giving the accurate results. This chapter explains the causes, awareness of brain tumor segmentation and its classification, MRI scanning process and its operation, brain tumor classifications, and different segmentation methodologies.

The book features selected high-quality papers presented in International Conference on Computing, Power and Communication Technologies 2019 (GUCON 2019), organized by Galgotias University, India, in September 2019. Discussing in detail topics related to electronics devices, circuits and systems; signal processing; and bioinformatics, multimedia and machine learning, the papers in this book provide interesting reading for researchers, engineers, and students.

To successfully detect and diagnose disease, it is vital for medical diagnosticians to properly apply the latest medical imaging technologies. It is a worrisome reality that due to either the nature or volume of some of the images provided, early or obscured signs of disease can go undetected or be misdiagnosed. To combat these inaccuracies, diagno

The process of accurate detection of edges of MRI images of a brain is always a challenging but interesting problem. Accurate detection is very important and critical for the generation of correct diagnosis. The major problem that comes across while analyzing MRI images of a brain is the process of segmentation of brain MRI image involves the problem of searching anatomical regions of interest, which can help radiologists to extract shapes, appearance, and other structural features for diagnosis of diseases or treatment evaluation. The brain image segmentation is composed of many stages. During the last few years, preprocessing algorithms, techniques, and operators have emerged as a powerful tool for efficient extraction of regions of interest, performing basic algebraic operations on images, enhancing specific image features, and reducing data on both resolution and brightness. Edge detection is one of the techniques of image segmentation. Here from image segmentation, tumor is located. Finally, we try to retrieve tumor from MRI image of a brain in the form of edge more accurately and efficiently, by enhancing the performance of different kinds of edge detectors using fuzzy approach.

These are the proceedings of the 10th European Conference on Symbolic and Quantitative Approaches to Reasoning under Uncertainty, ECSQARU 2009, held in Verona (Italy), July 1–3, 2009. The biennial ECSQARU conferences are a major forum for advances in the theory and practice of reasoning under uncertainty. The 1st ECSQARU confer- ence was held in Marseille (1991), and since then it has been held in Granada (1993), Fribourg (1995), Bonn (1997), London (1999), Toulouse (2001), Aalborg (2003), Barcelona (2005) and Hammamet (2007). The 76 papers gathered in this volume were selected out of 118 submissions from 34 countries, after a rigorous review process. In addition, the conference included invited lectures by three outstanding researchers in the area: Isabelle Bloch ("Fuzzy and bipolar mathematical morphology, applications in spatial reasoning"), Petr Cintula ("From (deductive) fuzzy logic to (logic-based) fuzzy mathematics"), and Danièle Mundici ("Conditional and independence in many-valued logics"). Two special sessions were presented during the conference: "Conditioning, independence, inference" (organized by Giulianella Coletti and Barbara Vantaggi) and "Mathematical fuzzy logic" (organized by Stefano Aguzzoli, Brunella Gerla, Luigi Giro, Vincenzo Marra, Franco Montagna). On the whole, the program of the conference provided a broad, rich, and up-to-date perspective of the current high-level research in the area which is reflected in the contents of this volume.

Stimulated Raman Scattering Microscopy: and Applications describes innovations in instrumentation, data science, chemical probe development, and various applications enabled by a state-of-the-art stimulated Raman scattering (SRS) microscope. Beginning by introducing the history of SRS, this book is composed of seven parts in depth including instrumentation strategies that have pushed the physical limits of SRS microscopy, vibrational probes (which increased the SRS imaging functionality), data science methods, and recent efforts in miniaturization. This rapidly growing field needs a comprehensive resource that brings together the current knowledge on the topic, and this book does just that. Researchers who need to know the requirements for all aspects of the instrumentation as well as the requirements of different imaging applications (such as different types of biological tissue) will benefit enormously from the examples of successful demonstrations of SRS imaging in the book. Led by Editor-in-Chief Ji-Xin Cheng, a pioneer in coherent Raman scattering microscopy, the editorial team has brought together various experts on each aspect of SRS imaging from around the world to provide an authoritative guide to this increasingly important imaging technique. This book is a comprehensive reference for researchers, faculty, postdoctoral researchers, and engineers. Includes every aspect from theoretic reviews of SRS spectroscopy to innovations in instrumentation and applications of SRS microscopy Provides copious visual elements that illustrate key information, such as SRS images of various biological samples and instrument diagrams and schematics Edited by leading experts of SRS microscopy, with each chapter written by experts in their given topics

This two-volume set (CCIS 150 and CCIS 151) constitutes the refereed proceedings of the Second International Conference on Ubiquitous Computing and Multimedia Applications, UCMA 2011, held in Daejeon, Korea, in April 2011. The 86 revised full papers presented were carefully reviewed and selected from 570 submissions. Focusing on various aspects of advances in multimedia applications and ubiquitous computing with computational sciences, mathematics and information technology the papers present current research in the area of multimedia and ubiquitous environment including models and systems, new directions, novel applications associated with the utilization, and acceptance of ubiquitous computing devices and systems.

This book presents the latest research pertaining to the diagnosis, therapy and management of diffuse low-grade gliomas (DLGG) in adults, with a particular focus on the path towards individualised therapy for this kind of tumour. Recent research on the natural history of DLGGs and their interaction with the brain has led to new diagnostic and therapeutic strategies which increase survival and quality of life of the patient, and these methods are described in this book.