

1. Record Nr.	UNINA9910890181003321
Autore	Gogoi Ankur
Titolo	Biomedical Imaging : Advances in Artificial Intelligence and Machine Learning // edited by Ankur Gogoi, Nirmal Mazumder
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2024
ISBN	981-9753-45-7
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (359 pages)
Collana	Biological and Medical Physics, Biomedical Engineering, , 2197-5647
Altri autori (Persone)	MazumderNirmal
Disciplina	571.4
Soggetti	Biophysics Biomedical engineering Optical spectroscopy Cancer - Imaging Bioanalysis and Bioimaging Biomedical Engineering and Bioengineering Optical Spectroscopy Cancer Imaging
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Artificial intelligence (AI) in diagnostic medical image processing: Recent advances and challenges -- Introduction to machine learning -- Artificial intelligence in Raman spectroscopy and microscopy -- Machine learning based analysis in Biomedical applications -- Applications of support vector machine in polarization sensitive fluorescence spectroscopy in biophotonics research -- Tissue optical clearing and machine learning based analysis -- Machine learning based photoacoustic image analysis for cancer diagnosis -- Diffuse optical imaging and spectroscopy as a non-invasive diagnostic tool -- Machine learning in nonlinear optical microscopy -- Deep learning in quantitative phase imaging -- Deep learning in super resolution microscopy -- Machine learning based analysis in Stokes Mueller Polarization light applications -- Polarization resolved second harmonic generation for tissue imaging -- Light microscopy in endoscopy -- Deep learning-based algorithm applied to multiphoton microscopy -- Cross polarization optical coherence tomography applications in brain

research -- Machine learning applications in brain research -- Recent trends in survival prediction of malignant brain tumour patients.

Sommario/riassunto

This book presents the rapidly developing field of artificial intelligence and machine learning and its application in biomedical imaging. As is known, starting from the diagnosis of fractures by using X-rays to understanding the complex structure and function of the brain, biomedical imaging has contributed immensely toward the development of precision diagnosis and treatment strategies for numerous diseases. While continuous evolution in imaging technologies have enabled the acquisition of images having resolution and contrast far better than ever, it significantly increased the volume of data associated with each image scan—making it increasingly difficult for experts to analyze and interpret. In this context, the application of artificial intelligence (AI) and machine learning (ML) tools has become one of the most exciting frontlines of contemporary research in biomedical imaging due to their capability to extract minute traces of various disease signatures from large and complicated datasets and providing clear insight into the potential abnormalities with excellent accuracy, sensitivity, and specificity. The hallmark of this book will be the contributions from international leaders on different AI-aided advanced biomedical imaging modalities and techniques. Included will be comprehensive description of several of the technology-driven spectacular advances made over the past few years that have allowed early detection and delineation of abnormalities with sub-pixel image segmentation and classification. Starting from the fundamentals of biomedical image processing, the book presents a streamlined and focused coverage of the core principles, theoretical and experimental approaches, and state-of-the-art applications of most of the currently used biomedical imaging techniques powered by AI.
