*Next-Generation Computing and Communication Engineering*

# MEDICAL IMAGING AND HEALTH INFORMATICS

Edited By
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# Preface

There are many aspects to medical imaging and health informatics, including how they can be applied to real-world biomedical and healthcare challenges. Therefore, a collection of cutting-edge artificial intelligence (AI) and other allied approaches for healthcare and biomedical applications are provided in this book. Moreover, a diverse collection of state-of-the-art techniques and recent advancements in AI approaches are given, which are geared toward the challenges that healthcare institutions and hospitals face in terms of early detection of diseases, data processing, healthcare monitoring and prognosis of diseases.

Medical imaging and health informatics is a subfield of science and engineering which applies informatics to medicine and includes the study of design, development, and application of computational innovations to improve healthcare. The health domain has a wide range of challenges that can be addressed using computational approaches; therefore, the use of AI and associated technologies is becoming more common in society and healthcare. Currently, deep learning algorithms are a promising option for automated disease detection with high accuracy. Clinical data analysis employing these deep learning algorithms allows physicians to detect diseases earlier and treat patients more efficiently. Since these technologies have the potential to transform many aspects of patient care, disease detection, disease progression and pharmaceutical organization, approaches such as deep learning algorithms, convolutional neural networks, and image processing techniques are explored in this book.

This book also delves into a wide range of image segmentation, classification, registration, computer-aided analysis applications, methodologies, algorithms, platforms, and tools; and gives a holistic approach to the application of AI in healthcare through case studies and innovative applications. It also shows how image processing, machine learning and deep learning techniques can be applied for medical diagnostics in several specific health scenarios such as COVID-19, lung cancer, cardiovascular diseases, breast cancer, liver tumor, bone fractures, etc. Also highlighted are the significant issues and concerns regarding the use of AI in healthcare together with other allied areas, such as the internet of things (IoT) and medical informatics, to construct a global multidisciplinary forum.

Since elements resulting from the growing profusion and complexity of data in the healthcare sector are emphasized in this book, it will assist scholars in focusing on future research problems and objectives. Our principal goal is to leverage AI, biomedical and health informatics for effective analysis and application to provide a tangible contribution to innovative breakthroughs in healthcare.

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