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Khalid Raza
Editor

Computational Intelligence Methods in COVID-19: Surveillance, Prevention, Prediction and Diagnosis

Springer

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This volume is dedicated to my beloved wife
Farhat
and my son
Arham

Preface

The novel coronavirus disease 2019 (COVID-19) pandemic has posed a major threat to human life and health. The COVID-19 had been documented in more than 210 countries, directly affecting people's life. There is a great crisis all over the world, and scientific communities are rigorously looking for instant solutions to deal with COVID-19 problems. Computational intelligence (CI), being powerful tools, can be applied to fight against COVID-19. This edited volume aims to provide recent research and developments in CI to fight against COVID-19. This edited volume has 22 chapters which is divided into five parts.

First part contains two introductory chapters that cover the basic concepts of CI methods and its applications in surveillance, prevention, prediction, diagnosis and therapeutic of COVID-19; and basics of coronaviruses, its epidemic, viral structure, its genome and so on.

Second part comprises four chapters which cover applications of CI in surveillance and prevention of COVID-19 infection. It covers how CI and social network analysis can be used to track the COVID-19 outbreak and identify key spreaders. Further, this section also covers mobile technology solutions and the role of IoT for surveillance and prevention of COVID-19 spread.

Third part is a collection of seven chapters that demonstrate how CI is helpful in the prediction and diagnosis of COVID-19. It systematically presents available predictive systems and data models, comparative study of SIR prediction models and disease control strategies, particle swarm optimization (PSO) for prediction of COVID-19, epidemic data visualization and forecasting using Elasticsearch, medical image-based diagnosis of zoonotic COVID-19 infection.

Fourth part has three chapters that attempt to present the role of CI in computer-aided drug design, drug repurposing using machine learning and vaccine design.

Fifth part contains six chapters that extensively cover the role of big data, Intelligent Internet of Medical Things (IoMT) and image processing to combat deadly COVID-19.

The contributing authors of this volume are experts in their fields, and they are from various reputed universities and institutions across the world. This volume is a valuable and comprehensive resource for computer and data scientists, epidemiologists, radiologists, doctors, clinicians, pharmaceutical professionals, along with graduate and research students of interdisciplinary and multidisciplinary sciences.

New Delhi, India Khalid Raza

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