

Preface

Even though there is a huge amount of work dealing with global optimization, there are still not many powerful techniques to be used for dense high-dimensional functions. One of the main reasons is the high computational cost involved. Usually, the approaches are computationally expensive to solve the global optimization problem reliably. Very often, it requires many function evaluations and iterations and arithmetic operations within the optimization code itself. Optimization has become an essential technology for addressing the limitation of resources and need for better decision-making in the biology and medicinal domains. Intelligent optimization techniques are playing an increasingly important role in understanding several fundamental problems in biology and medicine. The ultimate objectives of this volume are to provide challenges and opportunities to the research communities with an updated, in-depth material on the application of intelligent optimization in biology and medicine in order to find solutions to the challenges and problems facing biology and medicine applications.

This volume comprises of 13 chapters, including an overview chapter, providing an up-to-date and state-of-the-art research on the application of intelligent optimization for bioinformatics applications, DNA-based Steganography, a modified Particle Swarm Optimization Algorithm for Solving Capacitated Maximal Covering Location Problem in Healthcare Systems, Optimization Methods for Medical Image Super Resolution Reconstruction and breast cancer classification. Moreover, some chapters that describe several bio-inspired approaches in MEDLINE Text Mining, DNA-Binding Proteins and Classes, Optimized Tumor Breast Cancer Classification using Combining Random Subspace and Static Classifiers Selection Paradigms, and Dental Image Registration.

It is hoped that the book will be a very good compendium for almost all readers—from students of undergraduate to postgraduate levels and also for researchers, professionals, etc.—who wish to enrich their knowledge of Intelligent Optimization in Biology and Medicine and applications with a single book in the best manner. As the editors, we hope that the chapters in this book will stimulate further research in Intelligent Optimization in Biology and Medicine systems and utilize them in real-world applications. We hope that this book, covering so many different aspects,

will be of value to all readers. We would like to thank also the reviewers for their diligence in reviewing the chapters. Special thanks go to our publisher, Springer, especially for the tireless work of the series editor of Intelligent Systems Reference Library, Dr. Thomas Ditzinger.

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Applications of Intelligent Optimization in Biology and
Medicine

Current Trends and Open Problems

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2016, XIII, 307 p. 100 illus., 47 illus. in color., Hardcover

ISBN: 978-3-319-21211-1