
Preface

Nature has been a constant source of inspiration for scientists since centuries. Various laws and theories have been formulated by observing the different phenomena that occur in nature. *Nature-inspired algorithms* is an area inspired by natural processes; in the recent past, many algorithms have been developed taking inspiration from certain biological, geographical, and chemical processes that take place in the natural world. Nature-inspired algorithms have the immense potential for optimizing complex real-world problems and have been applied in various areas. In the past two decades, plethora of new and promising nature-inspired algorithms has been introduced. The highly multidisciplinary nature of the field further has attracted a number of researchers. There is a mammoth of literature available in the field of nature-inspired algorithms. The current literature covers the theoretic concepts, but the practical applications might still be very difficult for students to comprehend and implement. Many students find it difficult to visualize the application of nature-inspired algorithms from theoretical text.

This book not only helps them in understanding these algorithms but also exposes them to the current developments over various related fields. This empowers them to pursue research in these areas and contribute toward research and development at large. The main purpose of this book is to explain the nature-inspired algorithms theoretically and in terms of their practical applications to real-world problems to the readers. This will enable them to get an in-depth, practical exposure to the methodology of the application of the nature-inspired algorithms in various situations.

This book can also be used as a standard text or reference book for courses related to nature-inspired algorithms, evolutionary algorithms, and so on. This book may be referred for the purpose of *elementary* and *advanced* studies as it introduces the basic concepts of nature-inspired computing and then also discusses some state-of-the-art variants of those basic algorithms and then finally explains their practical examples. This book also incorporates some of the recent developments over various areas.

Salient Features

- Introduction to the world of nature-inspired computing
- Foundations of the basic nature-inspired algorithms
- Detailed description of the problem and solution
- Information on recent developments in the various nature-inspired algorithms
- Interdisciplinary applications of the nature-inspired algorithms

Intended Readers

- Students of undergraduate, postgraduate, doctorate, and postdoctorate levels can refer this book as a text or reference book for nature-inspired algorithms.
 - Researchers can refer this book to obtain a good insight into the recent developments in the field of nature-inspired algorithms.
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Origin of This Book

This book is a result of the continuous research done over the time by the authors. Much of the work presented is done by the authors themselves. Databases to the various problems have either been self-generated by the authors or used from the public database repositories. At some places, the authors have also included a comprehensive discussion of the problems and the solutions present in the literature. This is a result of the efforts put in by various students of the ABV-Indian Institute of Information Technology and Management, Gwalior, India, in forms of projects: B.Tech, M.Tech, and PhD theses.

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