

Mario Köppen, Gerald Schaefer, and Ajith Abraham (Eds.)

Intelligent Computational Optimization in Engineering

Studies in Computational Intelligence, Volume 366

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Techniques and Applications

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Preface

Many engineering problems involve heuristic search and optimization where, for example, an input parameter vector for a given system has to be found in order to optimize the system response. Also, many engineering optimization problems, once discretized, may become combinatorial in nature, which gives rise to certain difficulties in terms of solution procedure. In the first instance many problems have enormous search spaces, are NP-hard and hence require heuristic solution techniques. A second difficulty is the lack of ability of classical solution techniques to determine appropriate (global) optima of non-convex problems involving numerous (local) optima. Under these conditions, approaches based on recent advances in computational optimization techniques have been shown to be advantageous and successful compared to classical approaches.

This book is the result of an open call for chapter contributions. Researchers and practitioners were asked to share their experience and newest methodologies with regard to intelligent optimization in various application domains. From the many contributions, twelve were selected that constitute the main part of this book. The focus is clearly on the application, and most of the chapters do provide a case study for the application of intelligent optimization techniques in a real-world application. Other chapters discuss the general experience and means to adapt the plain textbook algorithms within a group of applications.

We want to use the opportunity to thank all who have contributed to this collection, especially to all authors, to the anonymous referees who much helped to gain a high-quality selection and to further improve the quality of the contributions. Our thanks also goes to the publisher Springer for all their support, patience and assistance during the preparation of this book.

January 2011

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