

PREMIER REFERENCE SOURCE

MULTI-OBJECTIVE OPTIMIZATION IN COMPUTATIONAL INTELLIGENCE

THEORY AND PRACTICE



LAM THU BUI & SAMEER ALAM

Table of Contents

Foreword	xiv
Preface	xv
Acknowledgment	xix

Section I Fundamentals

Chapter I

An Introduction to Multi-Objective Optimization	1
<i>Lam Thu Bui, University of New South Wales, Australia</i>	
<i>Sameer Alam, University of New South Wales, Australia</i>	

Chapter II

Multi-Objective Particles Swarm Optimization Approaches.....	20
<i>Konstantinos E. Parsopoulos, University of Patras, Greece</i>	
<i>Michael N. Vrahatis, University of Patras, Greece</i>	

Chapter III

Generalized Differential Evolution for Constrained Multi-Objective Optimization	43
<i>Saku Kukkonen, Lappeenranta University of Technology, Finland</i>	
<i>Jouni Lampinen, University of Vaasa, Finland</i>	

Chapter IV

Towards a More Efficient Multi-Objective Particle Swarm Optimizer	76
<i>Luis V. Santana-Quintero, CINVESTAV-IPN, Evolutionary Computation Group</i>	
<i>(EVOCINV), Mexico</i>	
<i>Noel Ramírez-Santiago, CINVESTAV-IPN, Evolutionary Computation Group</i>	
<i>(EVOCINV), Mexico</i>	
<i>Carlos A. Coello Coello, CINVESTAV-IPN, Evolutionary Computation Group</i>	
<i>(EVOCINV), Mexico</i>	

Chapter V

Multi-Objective Optimization Using Artificial Immune Systems	106
<i>Licheng Jiao, Xidian University, P.R. China</i>	
<i>Maoguo Gong, Xidian University, P.R. China</i>	
<i>Wenping Ma, Xidian University, P.R. China</i>	
<i>Ronghua Shang, Xidian University, P.R. China</i>	

Chapter VI

Lexicographic Goal Programming and Assessment Tools for a Combinatorial Production Problem	148
<i>Seamus M. McGovern, U.S. DOT National Transportation Systems Center, USA</i>	
<i>Surendra M. Gupta, Northeastern University, USA</i>	

Chapter VII

Evolutionary Population Dynamics and Multi-Objective Optimisation Problems	185
<i>Andrew Lewis, Griffith University, Australia</i>	
<i>Sanaz Mostaghim, University of Karlsruhe, Germany</i>	
<i>Marcus Randall, Bond University, Australia</i>	

Section II Applications

Chapter VIII

Multi-Objective Evolutionary Algorithms for Sensor Network Design	208
<i>Ramesh Rajagopalan, Syracuse University, USA</i>	
<i>Chilukuri K. Mohan, Syracuse University, USA</i>	
<i>Kishan G. Mehrotra, Syracuse University, USA</i>	
<i>Pramod K. Varshney, Syracuse University, USA</i>	

Chapter IX

Evolutionary Multi-Objective Optimization for DNA Sequence Design	239
<i>Soo-Yong Shin, Seoul National University, Korea</i>	
<i>In-Hee Lee, Seoul National University, Korea</i>	
<i>Byoung-Tak Zhang, Seoul National University, Korea</i>	

Chapter X

Computational Intelligence to Speed-Up Multi-Objective Design Space Exploration of Embedded Systems.....	265
<i>Giuseppe Ascia, Università degli Studi di Catania, Italy</i>	
<i>Vincenzo Catania, Università degli Studi di Catania, Italy</i>	
<i>Alessandro G. Di Nuovo, Università degli Studi di Catania, Italy</i>	
<i>Maurizio Palesi, Università degli Studi di Catania, Italy</i>	
<i>Davide Patti, Università degli Studi di Catania, Italy</i>	

Chapter XI

Walking with EMO: Multi-Objective Robotics for Evolving Two, Four, and Six-Legged Locomotion.....	300
--	-----

Jason Teo, Universiti Malaysia Sabah, Malaysia

Lynn D. Neri, Universiti Malaysia Sabah, Malaysia

Minh H. Nguyen, University of New South Wales, Australia

Hussein A. Abbass, University of New South Wales, Australia

Chapter XII

Evolutionary Multi-Objective Optimization in Energy Conversion Systems: From Component Detail to System Configuration	333
--	-----

Andrea Toffolo, University of Padova, Italy

Chapter XIII

Evolutionary Multi-Objective Optimization for Assignment Problems	364
---	-----

Mark P. Kleeman, Air Force Institute of Technology, USA

Gary B. Lamont, Air Force Institute of Technology, USA

Chapter XIV

Evolutionary Multi-Objective Optimization in Military Applications	388
--	-----

Mark P. Kleeman, Air Force Institute of Technology, USA

Gary B. Lamont, Air Force Institute of Technology, USA

Compilation of References	430
--	-----

About the Contributors	461
-------------------------------------	-----

Index	469
--------------------	-----