Series on Vol. 1
Theoretical Computer Science

Theory of Randomized Search Heuristics

Foundations and Recent Developments

Editors

Anne Auger
INRIA, France

Benjamin Doerr
Max-Planck-Institut für Informatik, Germany

World Scientific

NEW JERSEY · LONDON · SINGAPORE · BEIJING · SHANGHAI · HONG KONG · TAIPEI · CHENNAI

Contents

Preface vii

1. Analyzing Randomized Search Heuristics: Tools from Probability Theory 1
   Benjamin Doerr

2. Runtime Analysis of Evolutionary Algorithms for Discrete Optimization 21
   Peter S. Oliveto and Xin Yao

3. Evolutionary Computation in Combinatorial Optimization 53
   Daniel Johannsen

4. Theoretical Aspects of Evolutionary Multiobjective Optimization 101
   Dimo Brockhoff

5. Memetic Evolutionary Algorithms 141
   Dirk Sudholt

6. Simulated Annealing 171
   Thomas Jansen

7. Theory of Particle Swarm Optimization 197
Carsten Witt

8. Ant Colony Optimization: Recent Developments in Theoretical Analysis 225
Walter J. Gutjahr

9. A "No Free Lunch" Tutorial: Sharpened and Focused No Free Lunch 255
Darrell Whitley and Jonathan Rowe

10. Theory of Evolution Strategies: A New Perspective 289
Anne Auger and Nikolaus Hansen

11. Lower Bounds for Evolution Strategies 327
Olivier Teytaud

Subject Index 355