Metaheuristic Optimization Via Memory and Evolution

Tabu Search and Scatter Search

Edited by
César Rego
Bahram Alidaee

KLUWER ACADEMIC PUBLISHERS

CONTENTS

Foreword vii

Part I: ADVANCES FOR NEW MODEL AND SOLUTION APPROACHES

1. A Scatter Search Tutorial for Graph-Based Permutation Problems 1
   César Rego and Pedro Leão

2. A Multistart Scatter Search Heuristic for Smooth NLP and MINLP Problems 25
   Zsolt Ugray, Leon Lasdon, John C. Plummer, Fred Glover, Jim Kelly and Rafael Martí

3. Scatter Search Methods for the Covering Tour Problem 59
   Roberto Baldacci, Marco A. Boschetti, Vittorio Maniezzo and Marco Zamboni

4. Solution of the Sonet Ring Assignment Problem with Capacity Constraints 93
   Roberto Aringhieri and Mauro Dell'Amico

Part II: ADVANCES FOR SOLVING CLASSICAL PROBLEMS

5. A Very Fast Tabu Search Algorithm for Job Shop Problem 117
   Józef Grabowski and Mieczyslaw Wodecki

6. Tabu Search Heuristics for the Vehicle Routing Problem 145
   Jean-François Cordeau and Gilbert Laporte

7. Some New Ideas in TS for Job Shop Scheduling 165
   Eugeniusz Nowicki and Czeslaw Smutnicki

8. A Tabu Search Heuristic for the Uncapacitated Facility Location Problem 191
   Minghe Sun

9. Adaptive Memory Search Guidance for Satisfiability Problems 213
   Arne Løkketangen and Fred Glover

Part III: EXPERIMENTAL EVALUATIONS

10. Lessons from Applying and Experimenting with Scatter Search 229
    Manuel Laguna and Vinícius A. Armentano

11. Tabu Search for Mixed-Integer Programming 247
João Pedro Pedroso

12. Scatter Search vs. Genetic Algorithms: An Experimental Evaluation with Permutation Problems 263
Rafael Martí, Manuel Laguna and Vicente Campos

Part IV: REVIEW OF RECENT DEVELOPMENTS

13. Parallel Computation, Co-operation, Tabu Search 283
Teodor Gabriel Crainic

14. Using Group Theory to Construct and Characterize Metaheuristic Search Neighborhoods 303
Bruce W. Colletti and J. Wesley Barnes

15. Logistics Management: An Opportunity for Metaheuristics 329
Helena R. Lourenço

Part V: NEW PROCEDURAL DESIGNS

16. On the Integration of Metaheuristic Strategies in Constraint Programming 357
Mauro Dell'Amico and Andrea Lodi

17. General Purpose Metrics for Solution Variety 373
David L. Woodruff

18. Controlled Pool Maintenance for Metaheuristics 387
Peter Greistorfer and Stefan Voß

19. Adaptive Memory Projection Methods for Integer Programming 425
Fred Glover

20. RAMP: A New Metaheuristic Framework for Combinatorial Optimization 441
César Rego

Index 461