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4.5.3 Local Search with Pairs of Neighborhood Operators4.5.4 Local Search with all Neighborhood Operators; 4.6 Summary; Chapter 5 Neighbor Evaluation Procedures in Local Search based Algorithms for solving the JSPTWT; 5.1 Basic Principles; 5.2 A Lower Bound Procedure for the Applica-tion of the CET Neighborhood; 5.3 A Lower Bound Procedure for the Applica-tion of the SCEI Neighborhood; 5.4 A new approach: Heads Updating; 5.5 Performance Test; 5.6 Summary; Chapter 6 Solving the JSPTWT - a new Solution Procedure; 6.1 Metaheuristic Concepts; 6.1.1 Basic Concept of Metaheuristics
6.1.2 Some Metaheuristics6.1.3 The Fitness Landscape: a brief Side Trip; 6.2 Algorithmic Concept for a new Solution Pro-cedure; 6.2.1 Motivation and Overview of the Algorithmic Concept; 6.2.2 Construction Algorithm; 6.2.3 Improvement Algorithm; 6.2.4 Adaptive Components; 6.2.5 Configuration and Parameter Values; Chapter 7 Computational Study; 7.1 Benchmark Instances of the JSPTWT; 7.1.1 Modification of JSP Instances; 7.1.2 Standard Benchmark Set of Singer and Pinedo; 7.1.3 Lawrence's Instances; 7.2 Other Objective Functions; 7.2.1 JSP with minimizing the Total Flow Time
7.2.2 JSP with minimizing the Number of Tardy Jobs7.3 Summary; Chapter 8 Conclusion; Bibliography; Appendix A Applying Neighborhood Operators: the example ft06 (f = 1.3); Appendix B Overview of considered Dispatching Rules; Appendix C Computational Results from the Literature; Appendix D Analysis of the EGRASP result for the problem instance orb08 (f = 1.6); Appendix E Computational Results for the JSPTWU

Sommario/riassunto

Jens Kuhpfahl analyzes the job shop scheduling problem with minimizing the total weighted tardiness as objective. First, he provides a suitable graph representation based on a disjunctive graph formulation. Second, several key components of local search procedures are analyzed and enhanced. The resulting outputs of these investigations contribute to the development of a new solution procedure whose performance quality leads to superior computational results. Contents Job Shop Scheduling – Formulation und Modelling Neighborhood Definitions for the JSPTWT Neighbor Evaluation Procedures Solving the JSPTWT – a new Solution Procedure Target Groups Researchers and students focusing on machine scheduling, operative production planning and control, as well as the development of powerful solution procedures Practitioners in these areas The Author Dr. Jens Kuhpfahl wrote his dissertation under the supervision of Prof. Dr. Christian Bierwirth at the Chair of Production and Logistics at the University of Halle (Saale).