

Metaheuristics for scheduling in industrial and manufacturing applications

[Xhafa F.](#) (ed), [Abraham A.](#) (ed), Springer Publishing Company, Incorporated, New York, NY, 2008. 346 pp. Type: Book (9783540789840)

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Full Text

Part of the "Studies in Computational Intelligence" series, this balanced collection of 13 chapters presents quality research, with each chapter describing an industrial or manufacturing case related to scheduling. Although the title claims the use of metaheuristics, the solutions are based on algorithms, heuristics, or metaheuristics. Heuristic algorithms are called heuristics. Successful heuristics often become algorithms. Heuristics are extremely useful as a starting point for many problems and frankly, very often, the only way to go.

The use of heuristics is very appropriate for most scheduling problems that are nondeterministic polynomial-time (NP) hard in terms of computational complexity theory. Since scheduling problems are real-life problems, they must be solved, although the optimal solution may not be attainable in practice or in a practical time frame.

The problems, methods, and approaches presented in the book are very diverse, offering a good starting point for solving most practical scheduling problems. The methods and approaches include: tabu search, scatter search, variable neighborhood search, genetic algorithms (GA), memetic algorithms, the Hunter-Killer (H-K) heuristic, ant colony optimization, graph coloring, and particle swarm optimization. The problems covered include flow shop, job shop, lot sizing, scheduling, two-level production planning, and railway scheduling; real instances from the Spanish Manager of Railway Infrastructure were used to evaluate the performance of the GA solution.

An advantage of the book--the diversity of the problems and solutions presented--is also its biggest drawback: the book's editors didn't coordinate the solutions prepared and presented by the authors of individual chapters. In addition, references to related papers are lacking.