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Moderate exponential-time algorithms for scheduling problems. (English) [Zbl 07618965]

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Summary: This survey investigates the field of moderate exponential-time algorithms for NP-hard scheduling problems, i.e., exact algorithms whose worst-case time complexity is moderately exponential with respect to brute force algorithms. Scheduling problems are very challenging problems for which interesting results have emerged in the literature since 2010. We will provide a comprehensive overview of the known results of these problems before detailing three general techniques to derive moderate exponential-time algorithms. These techniques are Sort & Search, Inclusion-Exclusion and Branching. In the last part of this survey, we will focus on side topics such as approximation in moderate exponential time, the design of lower bounds on worst-case time complexities or fixed-parameter tractability. We will also discuss the potential benefits of moderate exponential-time algorithms for efficiently solving in practice scheduling problems.

MSC:

68R05 Combinatorics in computer science
68W01 General topics in the theory of algorithms
68W40 Analysis of algorithms
90B35 Deterministic scheduling theory in operations research

Keywords:
scheduling theory; exact algorithms; complexity

Full Text: DOI

References:


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