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Optimal Scheduling with Nested Time Intervals and Three-Dimensional Strip Packing on Comparability Graphs of an Arborescence Order

By Thomas Rieger

Cuvillier Verlag Mrz 2016, 2016. Taschenbuch. Book Condition: Neu. 211x148x22 mm. Neuware - This thesis is concerned with scheduling and three-dimensional packing problems that arise when restricting to nested intervals - either for allocating jobs to time intervals (at machines) or for positioning boxes within a strip. The scheduling problems considered in the first part of this work are motivated by a real-world application in rail car maintenance, and result in a new type of job characteristic introduced into the methodology of scheduling. Being classified as strip packing problems on comparability graphs of an arborescence order, the packing problems of the second part of this thesis are further structurally characterized based on the concept of packing classes. It turns out that using this characterization, these packing problems can equivalently be solved by interval coloring adequate chordal graphs. For several variants of above-mentioned mathematical optimization problems complexity results are derived and approximation, pure heuristical as well as exact solution approaches presented. The performance of the approaches is finally discussed based on computational results. 156 pp. Englisch.



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