Novel Models and Algorithms for Integrated Production Planning and Scheduling

Ph.D. Thesis Summary

by

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This thesis is concerned with production planning and scheduling in make-to-order manufacturing system. It defines a novel formulation of the aggregate production planning problem, and an aggregation procedure to construct this representation from detailed production data. The objective of aggregation is to receive plans that can be refined into feasible detailed schedules. For detailed production scheduling, new techniques – so-called consistency preserving transformations – are proposed to boost the efficiency of current constraint-based scheduling algorithms. The transformations exploit structural properties commonly present in industrial problem instances. Finally, a pilot integrated production planner and scheduler software is introduced. It served as the test bed of the proposed models and algorithms during experiments run on real-life problem instances.

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