

Assembly Line Balancing under Uncertainty: Robust Optimization Models and an Exact Solution Method

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Abstract

We address line balancing under uncertainty and propose two robust optimization models. In these models, we assume interval uncertainty for operation times and generate line designs that are protected against disruptions. In order to solve the models exactly, a decomposition based algorithm is proposed and enhancement strategies are integrated to solve large scale instances. The efficiency of the algorithm is tested and the experimental results are presented. The contribution of this research lies in the novel models proposed and the decomposition based exact solution algorithm. To the best of our knowledge, this research is a pioneer work on robust assembly line balancing and it will serve as a basis to develop decision support systems on this crucial subject.