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# Multiobjective Hybrid Genetic Algorithms for Assembly Line Balancing Models

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## Abstract

The installation of an assembly line is a long-term decision and usually requires large capital investments. Therefore, it is important that an assembly line is designed and balanced so that it works as efficiently as possible. Most of the works related to the assembly lines concentrate on the assembly line balancing (ALB). The ALB model deals with the allocation of the tasks among stations so that the precedence relations are not violated and a given objective function is optimized. Besides balancing a newly designed assembly line, an existing assembly line has to be re-balanced periodically or after certain changes in the production process or the production plan. Because of the long-term effect of balancing decisions, the objective functions have to be carefully chosen while considering the strategic goals of the enterprise.

The most of assembly line balancing models where even one objective must be minimized are often NP-hard. However in practical applications, it is often the case that the network to be built is required to multiobjective. In this presentatiin, we first investigate a broad spectrum of multiobjective assembly line balancing models, analyze the recent related researches, design and validate new effective multiobjective hybrid genetic algorithms for for three kinds of major multiobjective ALB models: multiobjective robotic assembly line balancing (mo-rALB), multiobjective u-shaped assembly line balancing (mo-uALB), multiobjective assembly line balancing with alternative subgraphs (mo-sgALB). Finally we discuss the future research issues in the area.

## Biography

Seren Ozmehmet Tasan received the BS degree in 1998, MS degree in 2001 and PhD degree in 2007 from Dokuz Eylul University in Izmir, Turkey. Since 1998, she has been with Department of Industrial Engineering, Dokuz Eylul University. She was a visiting postdoc researcher in Graduate School of Information, Production and Systems, Waseda University as a Japanese Government Scholarship. Her research interests include cellular manufacturing, assembly line system design, project management, genetic algorithms and multiobjective optimization.