

Multi Objective Simultaneous Assembly Line Balancing and Buffer Sizing

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Abstract : Assembly line balancing problem is aimed to divide the tasks among the stations in assembly lines and optimize some objectives. In assembly lines the workload on stations is different from each other due to different tasks times and the difference in workloads between stations can cause blockage or starvation in some stations in assembly lines. Buffers are used to store the semi-finished parts between the stations and can help to smooth the assembly production. The assembly line balancing and buffer sizing problem can affect the throughput of the assembly lines. Assembly line balancing and buffer sizing problems have been studied separately in literature and due to their collective contribution in throughput rate of assembly lines, balancing and buffer sizing problem are desired to study simultaneously and therefore they are considered concurrently in current research. Current research is aimed to maximize throughput, minimize total size of buffers in assembly line and minimize workload variations in assembly line simultaneously. A multi objective optimization objective is designed which can give better Pareto solutions from the Pareto front and a simple example problem is solved for assembly line balancing and buffer sizing simultaneously. Current research is significant for assembly line balancing research and it can be significant to introduce optimization approaches which can optimize current multi objective problem in future.

Keywords : assembly line balancing, buffer sizing, Pareto solutions

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