A new hybrid genetic algorithm to solve more realistic mixed-model assembly line balancing problem

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Abstract: Continuous and unexpected changes in demands of customised products force companies to produce various types of products, concurrently. One of the intelligent methods to satisfy various customer demands and compete with rivals in today’s business environment is to assemble diverse models on the same assembly line, simultaneously. So, mixed-model assembly line balancing problem with parallel workstations and zoning constraints is studied in this paper. Firstly, relevant studies in the literature were presented in a summary. Then, solutions have been sought with hybrid genetic algorithm that is obtained from the combination of modified Comsoal method and genetic algorithm. Computational experiments were carried out on 20 benchmark problems to demonstrate the superiority of the proposed algorithm. The obtained results were compared with the results of pure genetic algorithm and other previous researches. Obviously, it has been observed that proposed algorithm has promising solution capacity especially on large-sized mixed-model assembly line balancing problems.

Keywords: assembly line balancing; mixed model; hybrid genetic algorithm; hGA; heuristics and meta-heuristics, artificial intelligence.


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