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Assembly Sequence Optimization Using the Bees Algorithm
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Abstract
The determination of the assembly sequence is an important decision in assembly planning. Optimum sequence selection is challenging because of several reasons such as optimization criteria and precedence constraints. Furthermore, a product can be assembled in many different alternatives in accordance with different sequences, thereby making the optimization of assembly sequences a multi-modal solution optimization problem. To allow the process planner to decide, unique optimum solutions are required to be develop as much as possible. In this study, the assembly sequence of a product was optimized by applying an algorithm known as the Bees Algorithm. To assess the performance of this Algorithm, the results are compared with results found by other algorithms. It is shown that, the Bees Algorithm obtained similar optimum fitness value with other algorithms but with the greatest number of optimal assembly sequences. As a result, the Bees Algorithm outperforms other algorithms in dealing with the multi-modal optimization problem of assembly sequence optimization. © 2022, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author Keywords
Assembly sequence planning; Bees Algorithm; Optimization

Index Keywords
Assembly; Assembly planning, Assembly sequence, Assembly sequence planning, Bee Algorithm, Optimisations, Optimization criteria, Optimization problems, Optimum sequences, Precedence constraints, Sequence optimization; Optimization

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