

Optimization of Assembly Sequence Planning Using Soft Computing Approaches: A Review

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Abstract

Assembly sequence planning (ASP) is an NP-hard problem that involves finding the most optimum sequence to assemble a product. The potential assembly sequences are too large to be handled effectively using traditional approaches for the complex mechanical product. Because of the problem complexity, ASP optimization is required for the efficient computational approach to determine the best assembly sequence. This topic has attracted many researchers from the computer science, engineering, and mathematics background. This paper presents a review of the research that used soft computing approaches to solve and optimize ASP problem. The review on this topic is important for the future researchers to contribute in ASP. The literature review was conducted through finding related published research papers specifically on ASP that used soft computing approaches. This review focused on ASP modeling approach, optimization algorithms and optimization objectives. Based on the conducted review, several future research directions were drawn. In terms of the problem modeling, future research should emphasize to model the flexible part in ASP. Besides, the consideration of sustainable manufacturing and ergonomic factors in ASP will also be the new directions in ASP research. In addition, a further study on new optimization algorithms is also suggested to obtain an optimal solution in reasonable computational time.