Solving assembly sequence planning using angle modulated simulated kalman filter

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ABSTRACT

This paper presents an implementation of Simulated Kalman Filter (SKF) algorithm for optimizing an Assembly Sequence Planning (ASP) problem. The SKF search strategy contains three simple steps; predict-measure-estimate. The main objective of the ASP is to determine the sequence of component installation to shorten assembly time or save assembly costs. Initially, permutation sequence is generated to represent each agent. Each agent is then subjected to a precedence matrix constraint to produce feasible assembly sequence. Next, the Angle Modulated SKF (AMSKF) is proposed for solving ASP problem. The main idea of the angle modulated approach in solving combinatorial optimization problem is to use a function, $g(x)$, to create a continuous signal. The performance of the proposed AMSKF is compared against previous works in solving ASP by applying BGSA, BPSO, and MSPSO. Using a case study of ASP, the results show that AMSKF outperformed all the algorithms in obtaining the best solution.