Optimization of Multi-Pass Pocket Milling Parameter Using Ant Colony Optimization

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ABSTRACT

In material removal process, milling is one of the oldest processes that were introduced to remove unwanted material using rotated cutting tool. Although a lot of research to improve the process has been done, the process improvement is not stopping there because of evolving new material, method and technology. This paper presents a study to optimize multi-pass pocket milling parameter using Ant Colony Optimization (ACO). Two objectives were set in this work; obtaining optimum surface roughness value (R_a), and minimize machining time (T_m), while the independent variables were spindle speed, feedrate and depth of cut. The numerical experiment confirm that the ACO is having better performance compare with other algorithms (including Genetic Algorithm) for this particular problem. Moreover, result from ACO algorithm able to meet required machining specification.