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Overview of PSO for Optimizing Process Parameters of Machining

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Abstract

In the current trends of optimizing machining process parameters, various evolutionary or meta-heuristic techniques such as Particle Swarm Optimization (PSO), Genetic Algorithm (GA), Simulated Annealing (SA), Ant Colony Optimization (ACO) and Artificial Bee Colony algorithm (ABC) have been used. This paper gives an overview of PSO techniques to optimize machining process parameter of both traditional and modern machining from 2007 to 2011. Machining process parameters such as cutting speed, depth of cut and radial rake angle are mostly considered by researchers in order to minimize or maximize machining performances. From the review, the most machining process considered in PSO was multi-pass turning while the most considered machining performance was production costs.

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1. Introduction

According to [1] there are five groups of manufacturing processes which includes casting, forming, powder metallurgy, joining and machining. Machining can be defined as the process of removing unwanted segment of metal workpiece in the form of chips. The machining process will shape the workpiece as desired and it is usually done using machine and cutting tools. The machining cutting process can be divided into two major groups which are i) cutting process with traditional machining (e.g turning, milling, boring and grinding) and ii) cutting process with modern machining (e.g electrical discharge machining (EDM) and abrasive waterjet (AWJ)). There are many researches that have been

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