

عنوان مقاله:

Optimization of tool wear rate and surface quality in turning process of 30MV6 steel parts

محل انتشار:

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خلاصه مقاله:

In this paper, modeling and optimization of tool wear rate and surface quality in turning process have been considered. Cutting speed, feed rate, depth of cut, clearance angle and tool radius have been considered as the process input variables. The experiments have been carried out on micro-alloy 30SMV6 steel parts commonly used in automotive industries. Taguchi approach has been chosen to gather the required data for modeling and optimization purposes. Next, regression functions (linear, quadratic and logarithmic) have been fit on the experimental data. Then, the best and most fitted models were selected based on the results of statistical analysis. The statistical analysis showed that the logarithmic and linear models are the best ones for tool wear rate and surface quality respectively. In the next stage of the research, simulated annealing (SA) algorithm has been developed to determine the optimal levels of input parameters to reach the least tool wear rate and the best surface quality. Finally, a set of validation tests were performed. The results showed that the proposed method is sufficient in modeling and optimization of the process.

کلمات کلیدی:

.regression modeling, design of experiment, Taguchi method, simulated annealing algorithm

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