

Title:

Statistically optimized and experimentally validated turning tool life estimation and prediction

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Collaborators:**Grant:****Short Description:**

Tool life in machining is the measure that gives manufacturers primordial indications on the number of tool usage. In this paper, the influence of several turning parameters, such as the speed, depth of cut, and feed on tool life, was investigated. Experimental data were initially collected based on the Taguchi orthogonal array method for experimental design. Modelling was carried out using regression analysis and the analysis of variance techniques. Mathematical relationships between turning parameters and their related outputs were developed and tested. A Tabu search algorithm was then used to minimize a weighted sum of the outputs that represent different measures of turning quality and determine the optimal set of parameters for any combination of the weighting factors.