

[Keynote Talk]: Machining Parameters Optimization with Genetic Algorithm

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Abstract : This paper deals with the determination of the optimum machining parameters, according to the measured and modelled data of the cutting temperature and surface roughness, during the turning of the AISI 4140 steel. The high cutting temperatures are unwanted occurrences in the metal cutting process. They impact negatively on the quality of the machined part. The machining experiments were performed using different cutting regimes (cutting speed, feed rate and depth of cut), with different values of the workpiece hardness, which causes different values of the measured cutting temperature as well as the measured surface roughness. The temperature and surface roughness data were modelled after that using Response Surface Methodology (RSM). The obtained RSM models are used in the process of optimization of the cutting regimes using the Genetic Algorithms (GA) tool, which enables the metal cutting process in the optimum conditions.

Keywords : genetic algorithms, machining parameters, response surface methodology, turning process

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