УНИВЕРЗИТЕТ У НОВОМ САДУ
UNIVERSITY OF NOVI SAD

TOP ACHIEVEMENTS 2022

TECHNICAL FACULTY MIHAJLO PUPIN

"Determination of the temperature in the cutting zone while processing machine plastic using fuzzy-logic controller (FLC)" (Work published in a top international journal - M21)

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The folowing article considers the process of determining the working temperature of the workpiece in the cutting zone when machining the machine plastic on the lathe. Maintenance of the processing temperature of the workpiece in the limits of less than 100 °C is possible with the application and programming of the fuzzy logic controller (FLC) for the required processing conditions. Programming is established for three inputs and one output and the experimental results refer to generating the value of the acceptable temperature value for the polytetrafluoroethylene (PTFE) processed material, better known as teflon. Fuzzy logic controller adaptation based on Mamdani rules in this paper is supposed to regulate the number of revolutions of the main CNC machine spindle so that the workpiece temperature could be kept below 100 °C without using a coolant to avoid chemical reactions between the coolant and the base material. The input parameters for the fuzzy controller are the temperature of the machined material, feed speed and depth of cut and the output is the number of revolutions of the main spindle. Acceptable temperature of the workpiece ranges between 20 °C and 100 °C, of the feed speed between 0,05 and 0,089 mm/rev and of depth of cut between 1 and 5 mm.