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Prediction of Temperature Distribution during Drilling Process Using Artificial Neural Network

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Abstract : Experimental & numeral study of temperature distribution during milling process, is important in milling quality and tools life aspects. In the present study the milling cross-section temperature is determined by using Artificial Neural Networks (ANN) according to the temperature of certain points of the work piece and the points specifications and the milling rotational speed of the blade. In the present work, at first three-dimensional model of the work piece is provided and then by using the Computational Heat Transfer (CHT) simulations, temperature in different nods of the work piece are specified in steady-state conditions. Results obtained from CHT are used for training and testing the ANN approach. Using reverse engineering and setting the desired x, y, z and the milling rotational speed of the blade as input data to the network, the milling surface temperature determined by neural network is presented as output data. The desired points temperature for different milling blade rotational speed are obtained experimentally and by extrapolation method for the milling surface temperature is obtained and a comparison is performed among the soft programming ANN, CHT results and experimental data and it is observed that ANN soft programming code can be used more efficiently to determine the temperature in a milling process.

Keywords : artificial neural networks, milling process, rotational speed, temperature
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