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International Review of Mechanical Engineering
Volume 8, Issue 2, 2014, Pages 431-436

Surface roughness modeling in high speed hard turning using regression analysis (Article)

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Abstract   ⌄ View references (23)

Surface roughness plays an important role in the final quality of the machining parts. Therefore, predicting and simulating the roughness before the machining process is an important issue. The purpose of this research is to develop a reliable model for predicting and simulating the average surface roughness (Ra) in high speed hard turning. An experimental investigation was conducted to predict the surface roughness in the finish hard turning with higher cutting speed. A set of sparse experimental data for finish turning of hardened steel (AISI 4340) and mixed ceramic inserts made up of aluminum oxide and titanium carbide were used as work piece and cutting tools materials. Four different models for the surface roughness were developed by using regression analysis and artificial neural network techniques. Two different techniques have been used in the regression analysis; Box Behnken Design (BBD) and Face Central Cubic Design (FCC). The BBD model gave better prediction than the FCC in the design boundary. © 2014 Praise Worthy Prize S.r.l. - All rights reserved.

Author keywords

Box behnken design   Face central cubic   Surface roughness

ISSN: 19708734
Source Type: Journal
Original language: English

Document Type: Article
Publisher: Praise Worthy Prize

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