Efficient Prediction of Surface Roughness Using Box Behnken Design

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Abstract : Production of quality products required for specific engineering applications is an important issue. The roughness of the surface plays an important role in the quality of the product by using appropriate machining parameters to eliminate wastage due to over machining. To increase the quality of the surface, the optimum machining parameter setting is crucial during the machining operation. The effect of key machining parameters- spindle speed, feed rate, and depth of cut on surface roughness has been evaluated. Experimental work was carried out using High Speed Steel tool and AlSI 1018 as workpiece material. In this study, the predictive model has been developed using Box-Behnken Design. An experimental investigation has been carried out for this work using BBD for three factors and observed that the predictive model of Ra value is closed to predictive value with a marginal error of 2.8648 %. Developed model establishes a correlation between selected key machining parameters that influence the surface roughness in a AISI 1018. F

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