

Surface Roughness Analysis, Modelling and Prediction in Fused Deposition Modelling Additive Manufacturing Technology

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Abstract : Fused deposition modelling (FDM) is one of the most prominent rapid prototyping (RP) technologies which is being used to efficiently fabricate CAD 3D geometric models. However, the process is coupled with many drawbacks, of which the surface quality of the manufactured RP parts is among. Hence, studies relating to improving the surface roughness have been a key issue in the field of RP research. In this work, a technique of modelling the surface roughness in FDM is presented. Using experimentally measured surface roughness response of the FDM parts, an ANFIS prediction model was developed to obtain the surface roughness in the FDM parts using the main critical process parameters that affects the surface quality. The ANFIS model was validated and compared with experimental test results.

Keywords : surface roughness, fused deposition modelling (FDM), adaptive neuro fuzzy inference system (ANFIS), orientation

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