Abstract

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Closed Loop CNC Machining and Inspection of Interlinked Manufacturing Features for “Right First Time” Production

Low rate production systems are severely affected by scrap especially if the raw material cost is high. The focus of this research is to address this problem by proposing a system to reduce scrap rate in machining of multi-feature products. The system entitled “CLosEd loop MAchining and inspecTion System” CLeMatis achieves this goal by considering, for the first time, the sequence in which the features will be machined in conjunction with GD&T requirements that link the features together. During the manufacturing, after each step in the sequence, CLeMatis gathers data about features that are already machined for On-Machine Measurement (OMM) and s coordinates of subsequent features that are yet to be machined to meet GD&T requirements where possible. CLeMatis thus aims to produce each part right first time. In order to validate the system, different scenarios are proposed to assess the capability of the system towards complex parts.