

## A Study of Classification Models to Predict Drill-Bit Breakage Using Degradation Signals

**Authors :** Bharatendra Rai

**Abstract :** Cutting tools are widely used in manufacturing processes and drilling is the most commonly used machining process. Although drill-bits used in drilling may not be expensive, their breakage can cause damage to expensive work piece being drilled and at the same time has major impact on productivity. Predicting drill-bit breakage, therefore, is important in reducing cost and improving productivity. This study uses twenty features extracted from two degradation signals viz., thrust force and torque. The methodology used involves developing and comparing decision tree, random forest, and multinomial logistic regression models for classifying and predicting drill-bit breakage using degradation signals.

**Keywords :** degradation signal, drill-bit breakage, random forest, multinomial logistic regression

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