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Hybrid Approach for Cutting Tools Remaining Useful Life

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Prognostics of cutting tools health is an important and challenging task in manufacturing industry. The main objective of prognostics is to examine the ability of the cutting tool to perform its function throughout its expected life and determine its remaining useful life (RUL). An accurate estimate of RUL will aid in maximizing the utilization of the cutting tool, improve quality performance, and reduce system interruptions due to corrective maintenance. The main purpose of this proposal is to develop a hybrid data-driven RUL prediction model of cutting tools using machine learning classification followed by health index similarity approach (HISA) and. Although few researchers explored similar approaches, the full potential is yet to be investigated. More specifically, the impact of global versus local normalization, distance/similarity estimation, and optimal features fusion model selection warrant further investigation. Moreover, the idea of developing a hybrid classification-HISA approach for RUL prediction is very appealing to overcome the shortcomings of the two individual approaches. The final model allows for an on-line RUL estimation that will help decision makers to decide when to replace the cutting tool. To demonstrate the effectiveness of the model, a case study cited from literature is demonstrated.

Type of presentation

Talk

Classification

Both methodology and application

Keywords

Predictive Maintenance; RUL; Cutting Tools

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