Using Machine Learning to Monitor the Condition of the Cutting Edge during Milling Hardened Steel

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Abstract : The main goal of the work was to use machine learning to predict cutting-edge wear. The research was carried out while milling hardened steel with sintered carbide cutters at various cutting speeds. During the tests, cutting-edge wear was measured, and vibration acceleration signals were also measured. Appropriate measures were determined from the vibration signals and served as input data in the machine-learning process. Two approaches were used in this work. The first one involved a two-state classification of the cutting edge - suitable and unfit for further work. In the second approach, prediction of the cutting-edge state based on vibration signals was used. The obtained research results show that the appropriate use of machine learning algorithms gives excellent results related to monitoring cutting edge during the process.