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A machine learning approach for the condition monitoring of rotating machinery
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Abstract
Rotating machinery breakdowns are most commonly caused by failures in bearing subsystems. Consequently, condition monitoring of such subsystems could increase reliability of machines that are carrying out field operations. Recently, research has focused on the implementation of vibration signals analysis for health status diagnosis in bearings systems considering the use of acceleration measurements. Informative features sensitive to specific bearing faults and fault locations were constructed by using advanced signal processing techniques which enable the accurate discrimination of faults based on their location. In this paper, the architecture of a diagnostic system for extended faults in bearings based on neural networks is presented. The multilayer perceptron (MLP) with Bayesian automatic relevance determination has been applied in the classification of accelerometer data. New features like the line integral and feature based sensor fusion are introduced which enhance the fault identification performance. Vibration feature selection based on Bayesian automatic relevance determination is introduced for finding better feature combinations. © 2014 The Korean Society of Mechanical Engineers and Springer-Verlag Berlin Heidelberg.

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