Rolling Bearing Fault Diagnosis Based on Improved Complete Ensemble Empirical Mode Decomposition

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Abstract: In order to rolling bearing fault diagnosis using vibration signal analysis, this paper presents a new procedure based on the Improved Complete Ensemble Empirical Mode Decomposition ICEMD. In this procedure, firstly, in order to calculate the feature vector, we propose the use a combination of the Improved Complete Ensemble Empirical Mode Decomposition ICEMD and Entropy techniques for determining the entropy values for each one of the five first intrinsic mode functions (IMFs) of the ICEMD. Lastly, using the calculated feature vector, the Adaptive-Network-based Fuzzy Inference System ANFIS algorithm is used as a classifier system. In the experimental step, twelve different health bearing conditions were introduced to provide that the proposed approach can be an effective and efficient method for processing bearing fault signals.

Keywords: vibration signals analysis; processing bearing fault signals; ANFIS algorithm, improved CEEMDAN