Condition Monitoring of Rotating Machines Using BayesianTrained Artificial Neural Networks

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Abstract : The paper deals with the application of Artificial Neural Network (ANN) for the prediction of the effect ofunbalance fault on the frequency components of vibration signature of rotating machines. The suggested Technique isapplied to real vibratory signals resulting from sensors placed on a test rig interfaced to a multi-channel dataacquisition system OROS 25. Several statistical characteristic features of frequency domain vibration signals havebeen used as inputs to the ANN. The suggested ANN prediction model was implemented using Bayesian Evidencebased training algorithm knowing for its established efficiency comparatively to other learning techniques. Theperformance of the suggested condition monitoring scheme was confirmed by the accurate results of detection ofunbalance fault signals in the considered rotating machine.

Keywords : Condition monitoring, Fault Diagnosis, Artificial Neural Networks, Bayesian learning, Vibration analysis, unbalance, Rotating machines