Condition Monitoring of Machinery in Non-Stationary Operations

2012, Pages 285-292

Combining RBF-PCA-ReliefF Filter for a better diagnosis performances in rotating machines

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Abstract: Monitoring and faults diagnosis in rotating machinery is a current research field. In this direction the use of pattern recognition combined with non-destructive testing techniques such as' vibration analysis and signal processing can be very useful. In this paper was proposed, a diagnosis method of rotating machinery using vibration signatures with a Radial Basis Function classifier. The recorded signals were preprocessed with a Wavelet Decomposition and indicators were extracted both in temporal and frequency domain. To improve diagnosis performance, two techniques for dimension reduction of indicators space are combined; Principal Component Analysis and the filter ReliefF. The method was tested on real signatures from a vibration test bench, operating under several conditions, the results showed the interest to look closely at the choice of indicators in order to have best diagnosis performance.

Keywords : diagnosis, Rotating machinery, principal component analysis, radial basis function