Feature selection for enhancement of bearing fault detection and diagnosis based on self-organizing map

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Description
Mechanical faults account for a large majority of the faults in the electrical rotating machinery, it can result in partial or total breakdown of a motor. Therefore, their diagnosis is an intensively investigated field of research. This paper investigates the application of the Self-Organizing Maps (SOM) for the detection of rolling element bearing damages in three phase induction motor. It discusses the integration of features selection methods in the fault classification system based on SOM. The bearings vibration signal is obtained from experiment in different conditions: normal bearing, bearing with inner race fault, bearing with outer race fault and bearings with balls fault. Then multiple features extraction techniques from time, frequency and time-frequency domains are used. ReliefF and min redundancy max Relevance (mRMR) features selection techniques are used to select the optimal features and reduce the …