Support Vector Machine Based on Firefly Algorithm For Bearing Fault Diagnosis

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Abstract : The fault diagnostics and identification of rolling element bearings have been the subject of extensive research. It consists of two major parts: vibration signal feature extraction and condition classification for the extracted features. In this paper, feature extraction from faulty bearing vibration signals is performed by signal's time-varying statistical parameters. In this way, a 7-dimensional vector of the vibration signal feature is obtained. After feature extraction from vibration signal, the support vector machine (SVM) was applied to automate the fault diagnosis procedure. To improve the classification accuracy for bearing fault prediction, Firefly Algorithm (FFA) is employed to simultaneously optimize the SVM kernel function parameter and the penalty parameter. The results have shown feasibility and effectiveness of the proposed approach.

Keywords : Condition monitoring, Firefly Algorithm, Roller Bearing, Statistical parameters, Support Vector Machine.