



# **AN APPROPRIATE PROCEDURE FOR DETECTION OF JOURNAL-BEARING FAULT USING POWER SPECTRAL DENSITY, K-NEAREST NEIGHBOR AND SUPPORT VECTOR MACHINE**

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*Abstract- Journal-bearings play a significant role in industrial applications and the necessity of condition monitoring with nondestructive tests is increasing. This paper deals a proper fault detection technique based on power spectral density (PSD) of vibration signals in combination with K-Nearest Neighbor and Support Vector Machine (SVM). The frequency domain vibration signals of an internal combustion engine with three journal-bearing conditions were gained, corresponding to, (i) normal, (ii) corrosion and (iii) excessive wear. The features of the PSD values of vibration signals were extracted using statistical and vibration parameters. The extracted features were used as inputs to the KNN and SVM for three-class identification. The roles of PSD technique and the KNN and SVM classifiers were investigated. Results showed that the accuracy rate of fault diagnosis was 100%. Also, the results demonstrated that the combined PSD-SVM model had the potential for fault diagnosis of engine journal-bearing.*

**Index terms: condition monitoring, power spectral density, k-nearest neighbor, support vector machine, vibration signal, fault diagnosis**