

# **FAULT DIAGNOSIS OF ROTATING MACHINERY USING WAVELET TRANSFORM AND PRINCIPAL COMPONENT ANALYSIS**

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**Abstract :** Fault diagnosis is playing today a crucial role in industrial systems. To improve the reliability, safety and efficiency advanced methods of fault diagnosis become increasingly important for many systems. In this paper, fault diagnosis of rotating machinery is performed using a combination between Wavelet Transform (WT) and Principal Component Analysis (PCA) methods. The WT is employed to decompose the vibration signal of measurements data in different frequency bands. The obtained decomposition levels are used as input to the PCA method for fault detection and diagnosis. The objective of this method is to obtain the information contained in the frequency bands of the measured data. The proposed method is evaluated using experimental measurements data with mass unbalance and gear fault.

**Keywords :** Vibration measurement, Fault Diagnosis, Wavelet Analysis, principal component analysis, Mass Unbalance, Gear Fault