

Comparison of Different Machine Learning Methods for Transmission Fault Detection

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Abstract:

Gearboxes are essential components that fulfill various industrial and precision functions across different sectors. With the Industry 4.0 revolution, the monitoring and fault detection (FD) of rotating machinery have become increasingly significant. Gear faults can lead to nonlinear behaviors and abnormal vibration signals within the system, potentially increasing noise and vibration levels and causing severe operational issues. In this study, the effectiveness of detecting gearbox faults using accelerometer sensor signals is comparatively analyzed through five different machine learning techniques (KNN, RF, SVM, LD, ANN). The obtained results surpass those in the existing literature, offering a more efficient monitoring process for industrial applications.

Keywords:

Gearbox, fault detection, machine learning.