IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 5, May 2024

Condition Monitoring and Predictive Analytics of Electric Motor by using Machine Learning.

Mahadev L. Naik[1], Arsh Aslam Boat[2], Rahul Sanjay Gurav[3], Madhura Mukund Kale[4], Parvez Makbul Kapade[5]
Assistant Professor, Department of Mechanical Engineering[1]
BE Students, Department of Mechanical Engineering[2,3,4,5]
Finolex Academy of Management and Technology, Ratnagiri, India

Abstract: *This research paper addresses the crucial issue of early bearing failure within electric motors, a common problem impacting industrial operations. It begins with a thorough problem identification and historical study of asset failures to pinpoint strategic sensor placement on the motor casing, specifically targeting the bearing area. Time series data acquisition captures the dynamic motor behavior, with LabVIEW software facilitating visualization through frequency plots and spectral graphs. Subsequent preprocessing involves modifying data structure and computing vibration metrics like RRMS and IRRMS to quantify vibration levels. The processing stage consists of condition monitoring using structured supervised datasets transformed into the frequency domain in MATLAB. Interpretation of results enables bearing health assessment and identification of dominant frequency components. Additionally, the remaining useful life of the bearing is estimated using the Support Vector Classifier algorithm, supplemented by RRMS and IRRMS to enhance prediction accuracy. A machine learning model, developed in Python and trained on bearing datasets, predicts the remaining useful life based on sensor-collected data. This comprehensive methodology aims to provide insights into bearing health, facilitating proactive maintenance and optimizing industrial operations*

Keywords: Predictive maintenance, Electric motor bearings, Accelerometer sensors, Vibration analysis, Industrial efficiency