degradation patterns leading to higher accuracy in RUL predictions, particularly in scenarios where historical performance plays a significant role will be examined. The models' performance with more computational resources and often viewed as a «black box», making interpretability a challenge will also be discussed and analyzed.

The results of this comparative seeks to explore the LSTM's performance compared to RF in terms of accuracy by effectively modeling the temporal aspects of battery degradation. The advantages of RF in computational efficiency and ease of interpretation will be scrutinized. The analysis seeks to highlight the trade-offs between model complexity and accuracy, providing valuable insights for practitioners in battery health management. Ultimately, the choice between RF and LSTM models should be guided by specific application requirements, including the need for predictive accuracy versus interpretability and computational resource availability. This study contributes to the growing body of knowledge on machine learning applications in battery management systems and offers a foundation for future research aimed at improving RUL prediction methodologies.

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DEVELOPMENT OF AN AI BASED AC MOTOR FAULTY PREDICTION SYSTEM

Student, Master of Technology Degree in Industrial Automation Mutsvangwa T.
Lecturer, Eng. Makusha D. T.
Harare Institute of Technology, Harare, Zimbabwe

Maintenance of motors is very important in the manufacturing and mining industries. These faults can cause financial losses and time losses during production This article is going to review methods that have been used detect and predict AC motor faults prior to maintenance. It looks at nature, type and cause of faults in AC motors and then the methods used to predict this faults using AI and deep machine learning. The structure and main components of an AC motor are going to be described independently and their purpose is going to be stated too, these components are rotor, stator, bearing, fan blade, wiring cover, end bell, motor frame and fan blade.

This develpment is going to name and classify types of faults experienced by AC motors and what current systems are being used to solve these faults. The motor faults are classified into two types which are Electrical faults and Mechanical faults. Electrical faults includes sub classes of faults namely stator faults and rotor faults. Mechanical faults which includes bearing faults and eccentricity related faults. The four types of faults we implemented to determine the state of the motor are overload, open circuit fault, closed circuit fault and broken rotor bars. In the article a thourough study of the types of sensor to detect each type parameter caused by the fault is going to be shown.

This work is going to demonstrate how to detect these faults because most of these faults are really progressive faults which continue to occur on different random occasions. This article demonstrates how the system is to collect and classify data about each type of faults. The data base is then used to train AI algorithms such as Support Vector Machines, Artificial Neural Network, Machine learning and Fuzzy Logic. This data consists of stator currents, input power, slip, rotor speed, rotor currents and efficiency. After the training the system will be able to predict the possible fault to be experienced by the motor, and also provide the predicted date and time the fault is probably to happen.

The signal processing techniques are also described in this article. The article also outlines the types signal processing methods that we used when collecting parameters which are essential for error detection. The signal technique we used to monitor the wellness of the motor is the FFT (Fast fourier transform). The generated data set can be used to train other machine learning models. It also shows how IOT can be possibly be merged with AI so that responsible personnel can also get information about faulty machinery in remote places to give awareness and time that a faulty will probably occur. This can be used to enhance the efficiency of the system. This study contributes accuracy and reliability to maintance engineering using AI.