**ABSTRACT**

Device failure prediction plays a critical role in preventing costly downtime, improving system reliability, and enhancing product lifespan. This project focuses on developing a predictive model using a Multi-Layer Perceptron (MLP), a type of neural network, to predict potential device failures based on historical data. MLP's ability to learn complex patterns in data makes it a suitable choice for failure prediction, where subtle anomalies in operational parameters can be indicative of impending failures. By analyzing a dataset consisting of historical performance metrics and failure logs, the model will learn to predict failures before they occur. The objective is to minimize unplanned maintenance, increase efficiency, and reduce operational costs.The methodology includes data preprocessing, feature selection, training the MLP model, and evaluating its performance using accuracy, precision, recall, and F1-score. A comparison with other machine learning models like decision trees or SVMs may also be made to demonstrate the MLP's effectiveness in this specific application.

***Keywords :***Device failure prediction, Multi-Layer Perceptron (MLP), neural networks, predictive maintenance, anomaly detection.