

## **PRUNED ANN MODEL FOR THREE PHASE INDUCTION MOTOR OPERATING CONDITIONS CLASSIFICATION**

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**ABSTRACT** - The Artificial Neural Networks (ANN) have become a very useful tool in a wide range of engineering applications. In this paper, feed forward neural network Optimal Brain Surgeon (OBS) pruned model is proposed to classify the operating conditions of three phase induction motor. The proposed model had been trained with error back propagation training algorithm using frequency and voltage as input signals with nine possible operating conditions (faulty and healthy) acting as output neurons of the neural network model. The simulation results show that the pruned ANN model can perform perfect classification for the operating conditions of three phase induction motor.

*Keywords* : Neural Networks, Optimal Brain Surgeon, Induction Motor.

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### **1. INTRODUCTION**

Condition monitoring has been used in rotating machines fault diagnosis and classification for decades due to its importance in identifying early stages of faults to avoid machine breakdown<sup>(1)</sup>. The induction machines are known as work horse of modern industries because of various technical and economical reasons. These machines face various conditions during their operation, which may lead to some modes of failures. Hence the operating condition classification becomes necessary in order to avoid catastrophic failures<sup>(2)</sup>. Recently, neural networks have attracted a lot of attention from the research community. Its application has grown beyond control system theory into a wider sphere