# CONDITION MONITORING FOR TRANSFORMERS USING INFRARED CAMERA AND ARTIFICIAL NEURAL NETWORK - TNBD JITRA

**Thesis is presented in partial fulfillment for the award of Bachelor of Electrical Engineering (Honours)**
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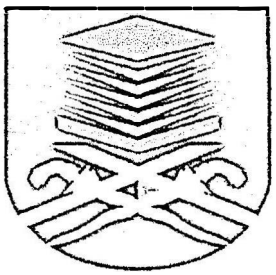

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# ABSTRACT

The title of this project is 'Condition Based Monitoring (CBM) of transformer utilizing Infrared Thermography (IRT). Thermography technique is applied to the external parts of the transformer, such as housing, bushing/ termination and cooling system. This project is to monitor the operation and its behavior (physically) of transformer using infrared camera. Some reviews, calibrating data and empirical surveys on transformers operation and its behavior need to perform better understanding on its characteristic. The data is also considered to make comfortable condition in the routine test of utilities (preventive maintenance).

The primary objectives are to provide an early detection of defect and addressed it before they lead to major breakdown. This paper will also prove that condition monitoring or predictive maintenance is very beneficial compared to preventive maintenance in terms of increasing equipment availability, reduced maintenance cost and more efficient repair.

These papers explain Artificial Neural Network (ANN) is applied to forecast the short-term temperature for a transformer. So this paper proved that the single-layer networks then in use were theoretically incapable of solving many simple problems. ANN also now what can happen at transformer one or two year later.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction to Project:

Transformers in general, over the last 40 to 50 years, have proven to be efficient and reliable. The majority of mechanical and electrical faults that occurred are detected prior to, during or shortly after commissioning. These faults may be quickly analyzed and rectified.

Transformers represent a large capital investment for industries, and a return on that investment must be realized in the form of long-term reliability. Without information concerning transformers insulating oil quality, cooling system and all bushing/termination conditions, maintenance scheduling is no more than guesswork. An effective condition-based monitoring (CBM) program is therefore a critical component of strategic planning.

The need for improved performance from expensive industrial plant has in recent years necessitated the application of 'Condition-Monitoring' methodologies. These can provide early warning of potential failure with the opportunity of organizing avoidance strategies to minimized lost time and unexpected costs, thus greatly improving manufacturing efficiency.

ANNs represent a growing new technology as indicated by the wide variety of application, such as remote sensing, control, forecasting, pattern recognition etc. The main reason for this growing activity is the ability of ANNs to learn complex non-linear relationship and their modulator structures, which allow parallel processing. .

An artificial neural network (ANN) as a computing system is made up of a number of simple, and highly interconnected processing elements, which