ANALYSIS OF AIR QUALITY INDEX (AQI) IN KLANG VALLEY USING ARTIFICIAL NEURAL NETWORK (ANN) TECHNIQUE

This thesis is presented in partial fulfillment for the award of

Bachelor of Engineering (Hons.) Electrical

UNIVERSITI TEKNOLOGI MARA

ROSLI BIN IDRIS

Faculty of Electrical Engineering

UNIVERSITI TEKNOLOGI MARA

40450 Shah Alam, Selangor

ACKNOWLEDGEMENT

ABSTRACT

This project investigates and analyzes the effectiveness of Artificial Neural Networks (ANN) technique in predicting the Air Quality Index (AQI) in Klang Valley. The ANN technique simplifies and speeds up the computation of the AQI, as compared to the current existing method used by Department of Environment (DOE). In the ANN technique, three methods will be used. The methods are Levenberg-Marquardt Algorithms, Resilient Backpropagation and Quasi-Newton Algorithms will be considered adopted to analyze the AQI data. Between these three methods, the Levenberg-Marquardt Algorithms is the best method for analyzing AQI data with the lowest error of data during training process which is from -0.5569 to 0.5787 and also has the fastest learning or training the AQI data.

TABLE OF CONTENTS

CHAPTER   **DESCRIPTION**   **PAGE**

CHAPTER 1

INTRODUCTION

1.0   INTRODUCTION

Air pollutants at ground level can be harmful to human health if their concentrations exceed certain acceptable levels. As pollutants accumulate in or near large metropolitan areas, this typically exposes people to unhealthy pollution and the environment agencies have been using Air Quality Index (AQI) for public information and data interpretation [1].

The Department of Environment (DOE) of Malaysia used the Recommended Malaysian Air Quality Guidelines (RMG) to grade the level of air pollution in Malaysia. AQI is for guidelines to observe the quality of air and presents whether it's safe or not for human life. Sources of air pollutants may be divided between natural and human-made. These will affect the air quality and may possibly harm populations in ways so subtle or slow that they have not yet been detected. Every level of air quality may insidiously affect health and behavior. For that reason, the ANN was applied to determine the air quality [2, 3].

This project is to analyze the AQI in Klang Valley by using ANN technique. Resilient Backpropagation, Quasi-Newton Algorithms and Levenberg-Marquardt Algorithms which are the Backpropagtion Neural Network (BPNN) method in ANN technique were used for considered and adopted to analyze the AQI. Then, these methods were compared to each other and observed the rating of error by each method. The method which has the lowest error rating is the goal to find the effectiveness for analysis of AQI in Klang Valley. Other than that, the method that used which has fastest learning or training is the good choice for training the data.

1