

**LOAD PREDICTION USING ARTIFICIAL NEURAL NETWORK
(ANN)**

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ABSTRACT

The purpose of this project is to study and develop an artificial neural network (ANN) model specifically for short term load prediction. A nonlinear load model is proposed and several structures of ANN for short term load prediction are tested. The outputs obtained were the predicted full day load demand for the next day or week. The ANN model has 4 layers; an input layer, two hidden layers and an output layer. The number of inputs was 6; while the number of hidden layer neurons was varied for different performance of the network. The output layer has 24 neurons. The ANN model was trained for over 5 weeks. A mean absolute percentage errors of 2.52% was achieved when the trained network was tested on random for one week's data.

Keywords-component; artificial neural network; short term load prediction;

TABLE OF CONTENTS

CHAPTER		PAGE
	DECLARATION	iii
	ACKNOWLEDGEMENT	iv
	ABSTRACT	v
	TABLE OF CONTENTS	vi
	LIST OF FIGURES	vii
	LIST OF TABLES	ix
	LIST OF ABBREVIATIONS	x
1.0	INTRODUCTION	1
	1.1 OVERVIEW	1
	1.2 PROBLEM STATEMENT	2
	1.3 OBJECTIVES	2
	1.4 SCOPE OF WORK	2
2.0	LITERATURE REVIEW	3
	2.1 WHAT IS ANN?	3
	2.2 ANN FOR SHORT TERM LOAD PREDICTION	4
	2.3 BACK PROPAGATION ALGORITHM	5
	2.4 FUNCTION APPROXIMATION	6
3.0	RESEARCH PROCESS AND DEVELOPMENT	8
	3.1 INTRODUCTION	8
	3.2 RESEARCH DESIGN	8
	3.3 ANN MODEL DEVELOPMENT	11
	3.3.1 PROPOSED ANN MODEL	11
	3.3.2 ALGORITHM FOR ANN IMPLEMENTATION	12

CHAPTER 1 - INTRODUCTION

1.1 OVERVIEW

Precise models for electrical power load prediction are important to the operation and planning of a utility company. Load prediction helps to make important decisions including decisions on purchasing and generation electric power, load switching and infrastructure development. Load forecasts are extremely important for energy suppliers, ISOs, financial institutions, and other participants in electric energy generation, transmission, distribution, and markets. Furthermore, the power load is influenced by the weather of the forecasting day [1–3].

Load forecasting in a power system can normally be categorized into the following categories [4]:

- * very short forecasting of up to a few minutes ahead
- * forecasting with a lead time of up to a few days ahead
- * forecasting energy requirements over a six month or one year period
- * long term forecasting of the power system peak load up to 10 years ahead.

In short term load forecasting (STLF), the key variables are time, forecasted weather variables, and historical load [5]. Statistical and artificial intelligence method have been widely developed to forecast the load. However the accuracy of the models can be improved. Thus, the objective of this study is to find and improve the algorithm that artificial neural network (ANN) is very effective and reliable in predicting the short-term load forecasting.