ARTIFICIAL NEURAL NETWORK APPLICATION FOR IDENTIFICATION OF HARMONIC DISTIRBANCE

This thesis presented in partial fulfilments for the award of the
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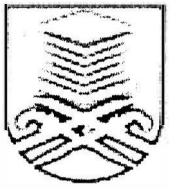
UNIVERSITI TEKNOLOGI MARA



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ABSTRACT

Both electric utilities and end users of electric power are becoming increasingly concerned about the quality of power. The term Power Quality (PQ) can be best defined as any power problem manifested in voltage, current or disopnation of customer equipment. In response to this dilemma, the waveform contains the harmonics will be identified. In this project, the Feedforward Neural Network (FFNN) is proposed to identify and classify the power quality disturbances and simulated with MATLAB software. The harmonic signals and spectrum are determined by the application of a Fast Fourier Transform (FFT).

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Power quality problem have been classified as one important field for consumer, manufacturer and utility. The impacts of low power quality have given massive losses in term of monetory, low quality product and increase in maintenance [1]. Low power quality is identified originated from various factors such as harmonic polluted system, improper grounding and magnification of voltage due to the capacitor switching. These factors commonly could be mitigated if the knowledge of power quality is improved. However, the power quality problem is impossible to be avoid. As far as power quality is concerned, the indices of quality of power could be upgraded if the root cause of problem could be identified [2].

Experts have classified the power quality problem into different classes based on voltage and current signals pattern. These signals are originated from different causes and create different problems to the electrical system. Thus, the identification of these signals are important before a proper finding and mitigation action could be taken.

1.2 Scope of work

The objective of this work is to identify the various type of harmonic disturbance sources. The proposed system is based on Fast-Fourier Transform (FFT) analysis and neural network to identify the pattern of the disturbances. The work presented here consist of two parts, which is the real data from IEEE and FFT will produced the harmonic current signal and harmonic power spectrum. The analysis on the