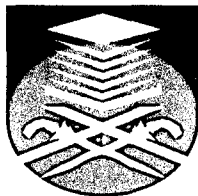


ANN – BASED TECHNIQUE FOR TRANSIENT STABILITY

Thesis presented in partial fulfillment for the award of the
Bachelor in Engineering (Honors) (Electrical)
Of
UNIVERSITI TEKNOLOGI MARA



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ACKNOWLEDGEMENT

In the name of Allah, the Merciful and Gracious. Praise is for Allah, Lord of the world Guide of the bewildered and joiner of those who are severed; whose helps us seeking in worldly matter and n religion. May His blessings and peace upon our master Muhammad, the Truthful and Trustworthy, and upon his family, and Companions, and all those excel in the following them until the day of Reckoning.

I am deeply indebted to my Supervisor, Dr. Ismail Bin Musirin for making many helpful suggestions, excellent discussion, his friendship, patience and guidance to improve my thesis in many ways. Appreciation is also extended to Dr. Ngah Ramzi for his helpful and all her suggestions. Special thanks are extended to Dr. Norazliza Hamzah for her support.

Lastly, it would not be possible for me to complete this project without the moral support from my beloved parents, family, and all my friends for their understanding, support and encouragement through out the years. Thank you.

ABSTRACT

Transient stability prediction (TSP) in a power system network is not feasible due to intensive computation involvement. Artificial neural network (ANN) has been proposed as one of the approaches to this problem based on its ability to quickly map nonlinear relationships between the input and the output data. In this stage, input variables and targeted output will be identified. Consequently, training and testing program codes will be developed in MATLAB in order to implement the artificial neural network prediction process. Eventually, a fully- trained artificial neural network should be successfully developed which should be able to perform the TSP without having to conduct the conventional transient stability analysis. In order to realize the effectiveness of the proposed technique, a standard test system was utilized for validation purpose.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Transient stability of power system is an extremely highly non-linear problem. The special method had been studied to solve the problem such as numerical method which involves bulky computations and methods specific to dynamic nonlinear systems [1]. Conventional numerical methods or time domain integration of the nonlinear equation are unable to meet the demand because of their conceptual inadequacy to effectively tackle sensitivity and control aspects, especially in real time [2]. This is because conventional transient stability measure of the system robustness to withstand a large disturbance is its corresponding critical clearing time. The critical clearing time means the maximum time duration that the disturbance may act without the systems losing its capability to recover stable operation.

In recent years, several type of network has been proposed by Paul Werbos in early 1970s [3], Amari 1977[3], Jon Hopfield 1982[3], and Kohoren 1984[3] for solving prediction problems. A possible method that can be performed is the artificial neural network (ANN) [3]. ANN is biological inspired intelligent techniques which are generally made of a number of simple and highly interconnected processing element organized [14]. ANN has shown to be capable of finding internal representation of interdependencies within raw data not explicitly related or even known human expert. The typical characteristics of ANN are simplicity of building and training within short response time [13]. However, the training and testing process may require long computation time since the properties of the ANN are normally determined heuristically which would be very tedious. The training of ANN consists of training input and targeted output so as to effectively train the ANN. At this stage, suitable training properties will be identified. The connection weight of the ANN are changed in a direction to bring error