AN APPLICATION OF ARTIFICIAL NEURAL NETWORK ON SHORT TERM

LOAD FORECASTING USING BACK PROPAGATION ALGORITHM.

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ABSTRACT

This study is covered a new approach to load forecasting using Artificial Neural Network (ANNs). Improving accuracy of load forecast by Back Propagation Algorithm is the main objective for this project. This accuracy is dependent on several ANN parameters such as learning rate and momentum rate. The Back Propagation Algorithm, which consists of the multi-layered perception model, makes possible to train the ANN training patterns. As an input, we look at the past 24 hours load data with the type of days as weekdays, Sunday and public holidays. The next 24 hours load patters are considered as outputs. By using Back Propagation Algorithm with 25 hidden nodes, 0.7 learning rate and 0.7 momentum rate have been found to give faster result than other conventional techniques.

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TABLE OF CONTENTS

CHAPTER 1

1. INTRODUCTION

A power system planning consists of planning the operation, improvement and expansion of a power system. This requires load studies to forecast the future expansion to keep pace with the load growth. Many techniques and approach have been investigated to tackle this problem in the last two decades.

Load forecasting can be divided into two categories, which are long-term forecasting and short-term forecasting. Load –forecasting must take the view that the future is open to the effects of many human actions [9]. Many uncertainties arise from the impact of the changes in public perceptions, viewpoints and policies. Indeed, the only certainty in the future of electric power industry is uncertainties. Load management planning and conservation policy gives additional requirements on load forecasting.

For short term forecasting, day of the week, temperature and humidity forecast play vital role. Relatively, the long-term forecasting effects of many human actions. Thus, we will henceforth concentrate on short-term forecasting.

In general, the different available load forecasting techniques can be classified, according to the type of load pattern, into three classes which are stationary, non-stationary and seasonal or cyclical techniques [10]. The objective of the construction