

**ONE DAY AHEAD DAILY PEAK HOUR LOAD FORECASTING BY  
USING INVASIVE WEED OPTIMIZATION LEARNING  
ALGORITHM BASED ARTIFICIAL NEURAL NETWORK**

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## ABSTRACT

Load forecasting has been essential part of an efficient power system planning and operation. It is a pre-condition to economic dispatch of electrical power and improves the accuracy beside ascertain reliable operation of a power system. Normally the electrical energy demand is mostly dependent on various independent variables such as day, time, temperature, weather and holidays in a week. The load forecasting sensibility is a key to make sure the electrical energy supply to customers without harm in economic aspect of power system operation. In this project, an Artificial Neural Network (ANN) trained by the Invasive Weed Optimization (IWO) learning algorithm is proposed for short term load forecasting (STLF) model. By using 'seen' and 'unseen' of electrical energy demand data were used to test the performance of the proposed algorithm. Based on result obtained, it shows that IWO learning algorithm is capable to produce accurate prediction load demand. Hence, this indicates that Invasive Weed Optimization could be implemented as a new learning algorithm for an Artificial Neural Network.

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# CHAPTER 1

## INTRODUCTION

### 1.1 BACKGROUND OF STUDY

Load forecasting is a major part for the electric power system operation and planning efficiency. The relationship between factors that influencing the load power and load power demand is nonlinear therefore is difficult to determine the nonlinearity by using conventional methods [1]. The load forecasting sensibility is a key to make sure the electrical energy supply to customers without harm in economic aspect of power system operation [2]. This aspect is an important role for power utilities that supplying capacity of electrical energy must meet the demanding of consumers and not so far exceeded from demand required which may effected poorly for financial section [3]. This aspect also to ensure the electricity energy operates with economically, reliable and uninterrupted to the consumers. Load forecasting also important to system operators and market participants which it act as assistant to organizing suitable strategies of risk management and competitive energy trading [4]. The load forecasting is divided into four main periods such as very short-term load forecasting, short term load forecasting, medium term load forecasting and long term load forecasting [4].

- a) Very short-term load forecasting (VSTLF) i.e. performed for range one minute to a few minute ahead.
- b) Short-term load forecasting (STLF) i.e. performed for range one hour to one week ahead.