

## COMPARING THE PERFORMANCE OF PREDICTIVE MODELS CONSTRUCTED USING THE TECHNIQUES OF FEED-FORWARD AND GENERALIZED REGRESSION NEURAL NETWORKS

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### ABSTRACT

Artificial Neural Network (ANNs) is an efficient machine learning method that can be used to fits model from data for prediction purposes. It is capable of modelling the class prediction as a nonlinear combination of the inputs. However, a number of factors may affect the accuracy of the model created using this approach. The choice of network type and how the network is optimally configured plays important role in the performance of a predictive model created using neural network techniques. This paper compares the accuracy of two typical neural network techniques used for creating a predictive model. The techniques are feed-forward neural network and the generalized regression networks. The model created using both techniques are evaluated for correctness. The resulting outputs show that, the Generalized Regression Neural Network (GRNN) consistently produces a more accurate result. Findings further show that, the fitting of the network predictive model using the technique of Feed-forward Neural Network (FNN) records error value of 1.086 higher than the generalized regression network.

**Keywords:** *Feed-forward network, generalized regression, machine learning, prediction*

### INTRODUCTION

Prediction model is the task of building a model of the target variable as a function of the explanatory variables. A neural network is a machine learning method that is designed to model the way in which the brain performs a particular task or function of interest; the network is usually implemented by using electronic components (Haykin, 2009). Neural networks are generally good at fitting functions for prediction purposes. Some types of neural network techniques that can be used to fit such network models include: feed-forward, generalized regression, Hopfield, recurrent network and others.

Creating a predictive model is mostly performed using the feed-forward or generalized regression networks, there are some other techniques too. Prior to using any of these methods for model building, there are some tasks that must be performed on the data. There is need to pre-process the data to be trained, this is to ensure that, the data are in a suitable format for training. Also, there may be need to normalize the data, and in the process, string datasets are coded to numeric values of choice. Several methods