

# Analysis of Statistical Arbitrage in Indian Stock Markets

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# Virtual Stock Method

Predicting the price of the Stock based on historical Data.

Virtual Stock

Target Stock

# Virtual Stock Method

- Create a virtual stock which mirrors the behavior of the Target stock.

Select the Stocks which are related to the Target Stock

Target Stock – TV Today Group, Index Stocks – members of CNX Media Index ( 15 stocks)



Create a Linear super position of the stock prices of member stocks

Linear Regression, PCA + Regression



Compare the prices of the target stock with the virtual Stock

To decide when to Buy or Sell

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# CNX MEDIA

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**Target Stock**



**Stocks used to create the “Virtual Stock”**

JagranPrakashan

Prime Focus

Reliance Media

Sun TV Network

TV18 Broadcast

Zee Entertain

Ashtavinayak

DB Corp

DeccanChronicle

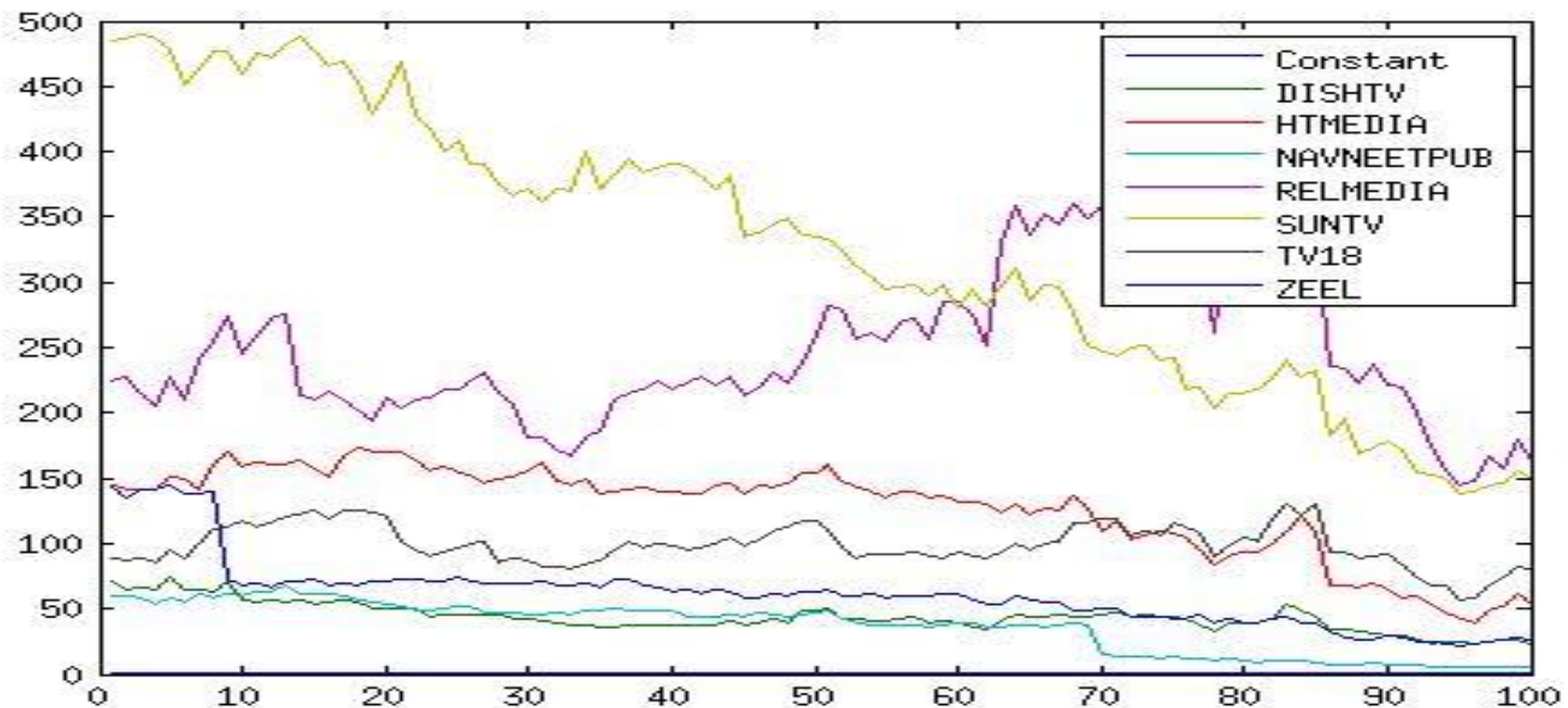
Den Networks

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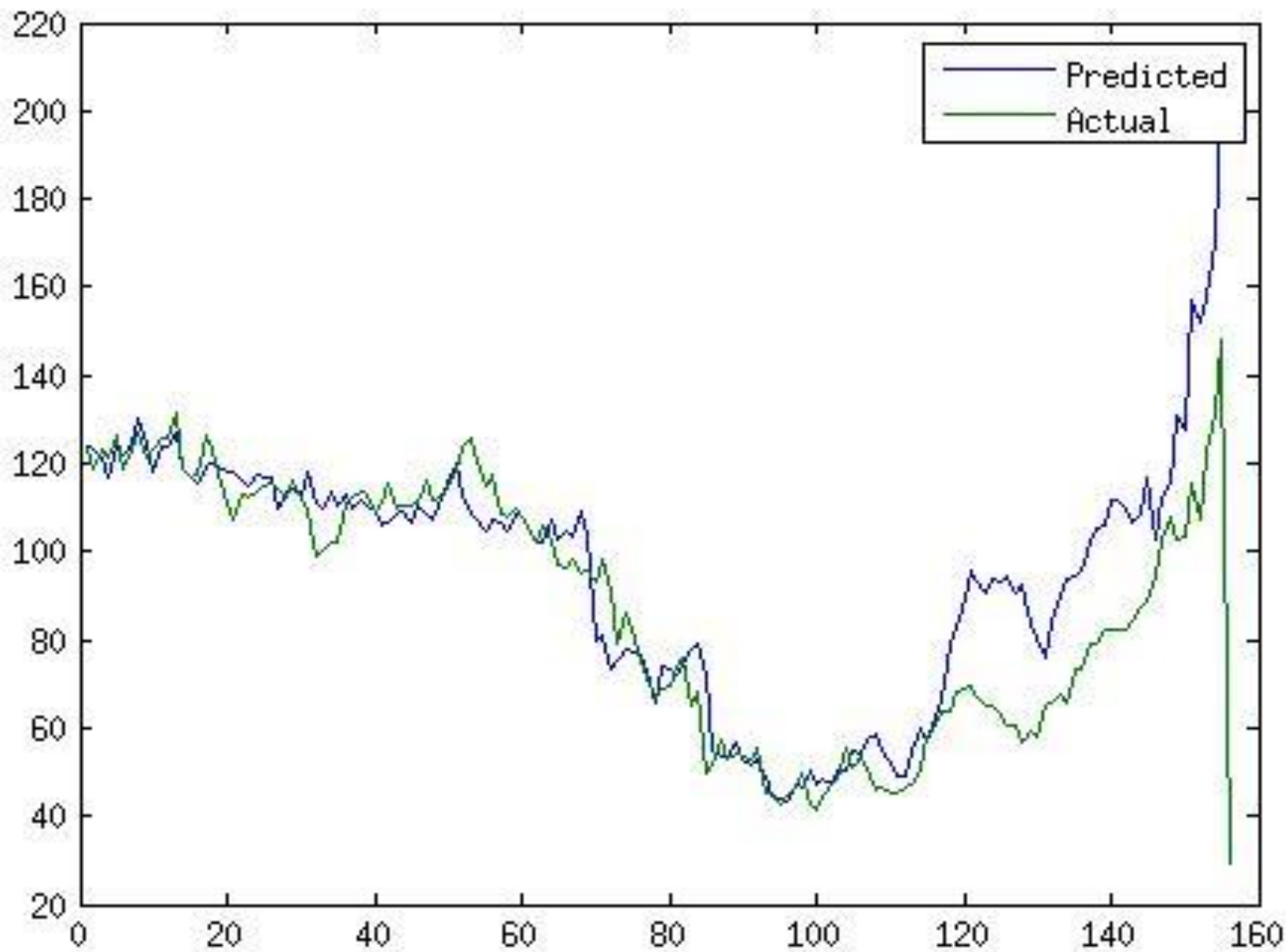
Hathway Cable

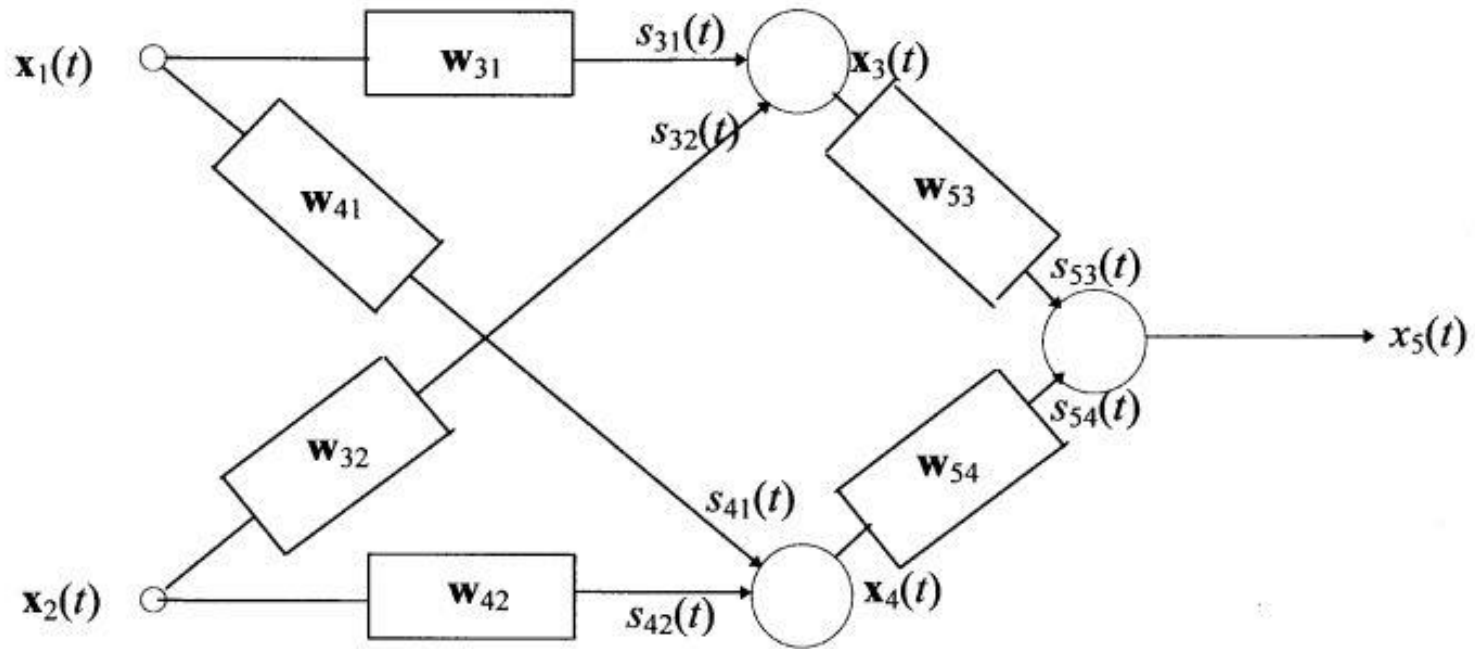
HT Media



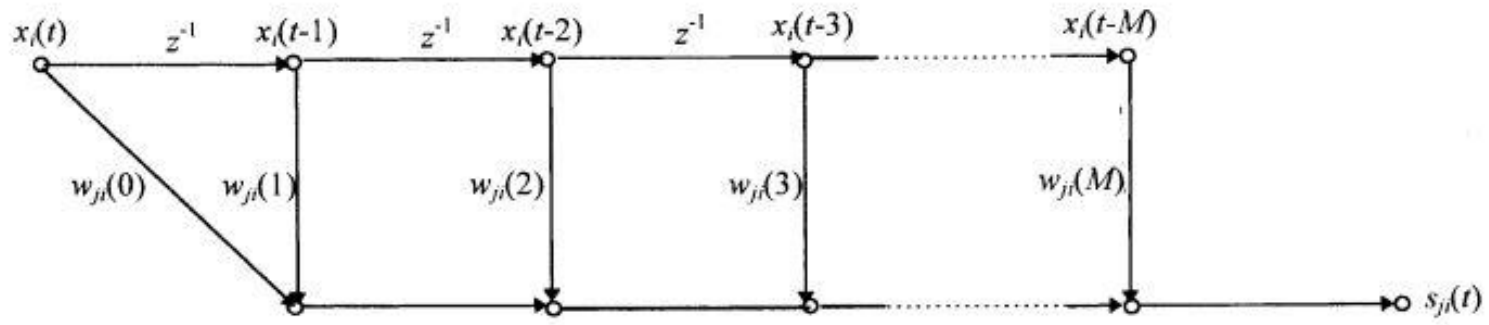
Using regression we calculate the coefficient  $\theta_i$

$$P_t = \theta_0 + \sum_{i=1}^{100} \theta_i Q_{it}.$$





(a)



(b)

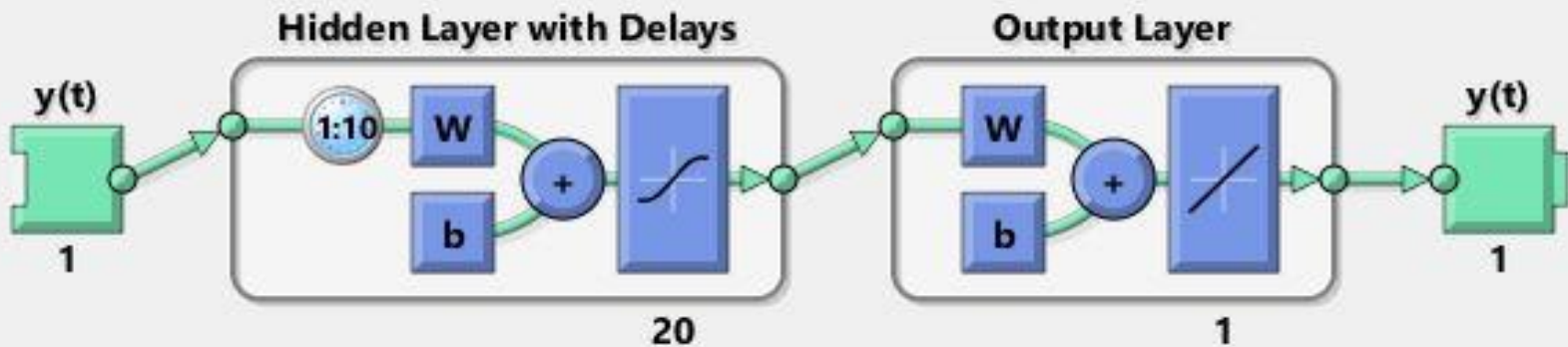
Fig. 1. (a) Three-neuron TDNN with FIR filters ( $w_{ji}$ ) as synaptic connections. (b) Expanded view of FIR synaptic connections of TDNN. FIR filters build internal memory into the network.

# Non linear Autoregressive(NAR):

Predict series  $y(t)$  using the past  $d$  values of  $y(t)$



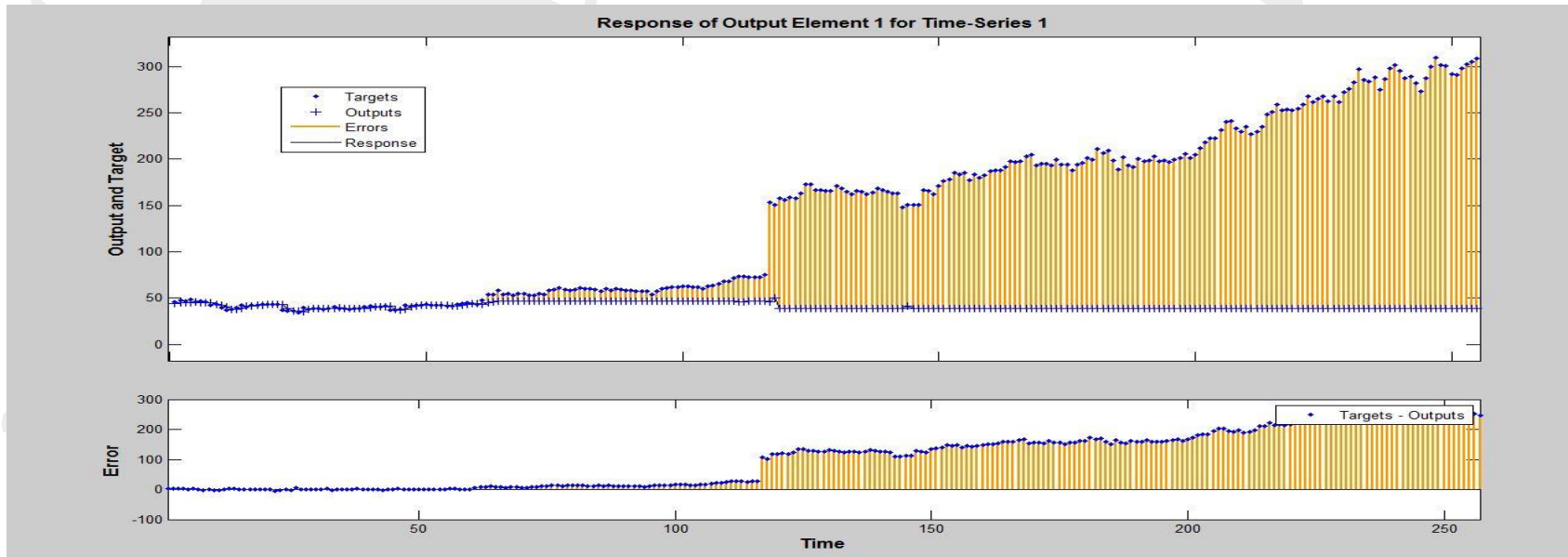
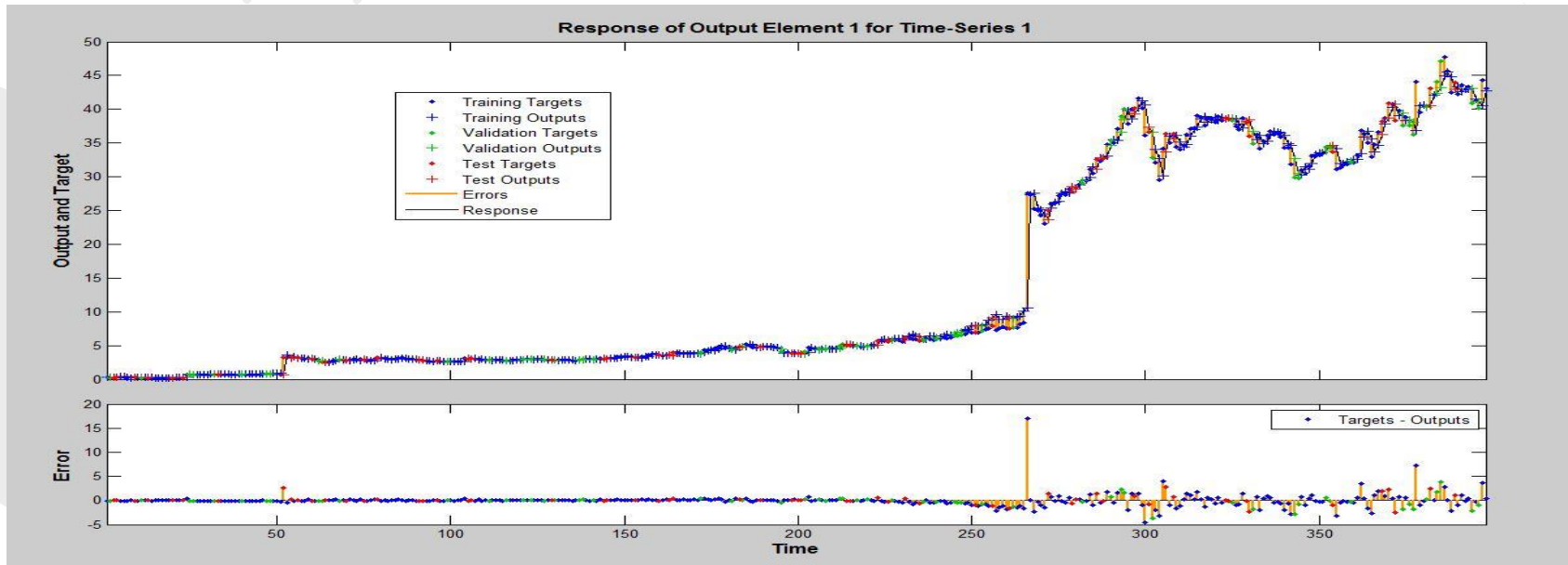
Neural network schematic structure:





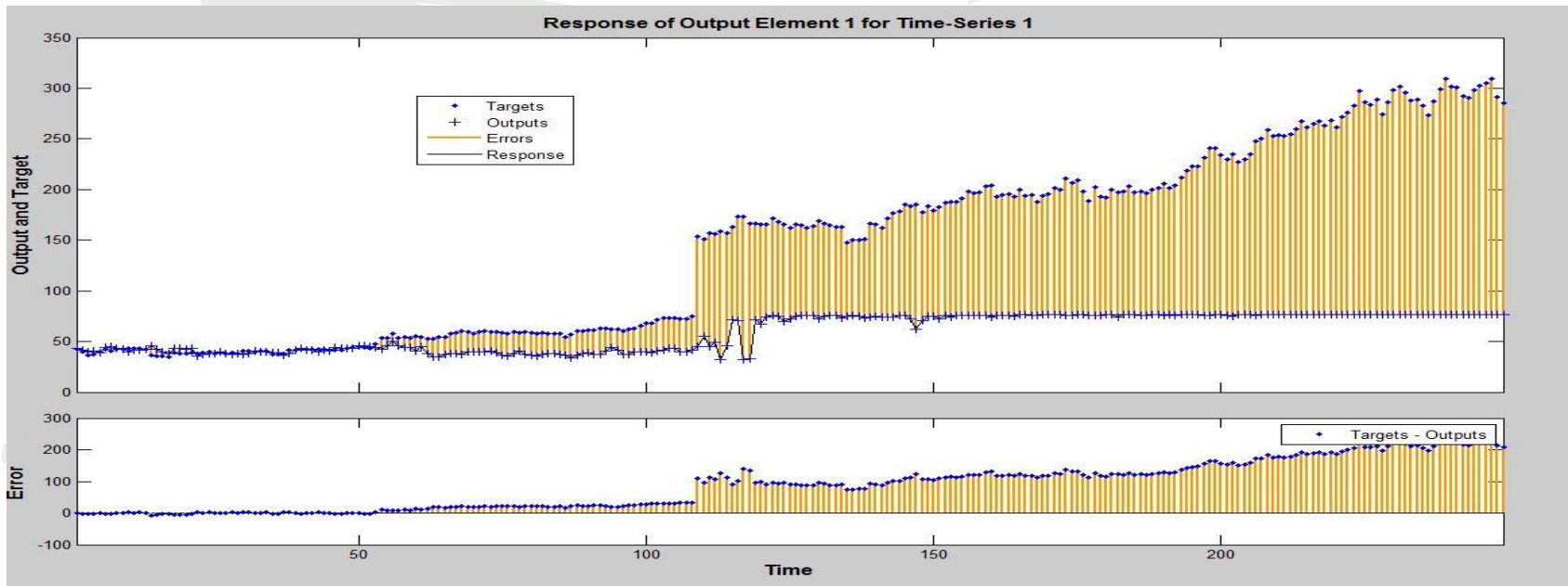
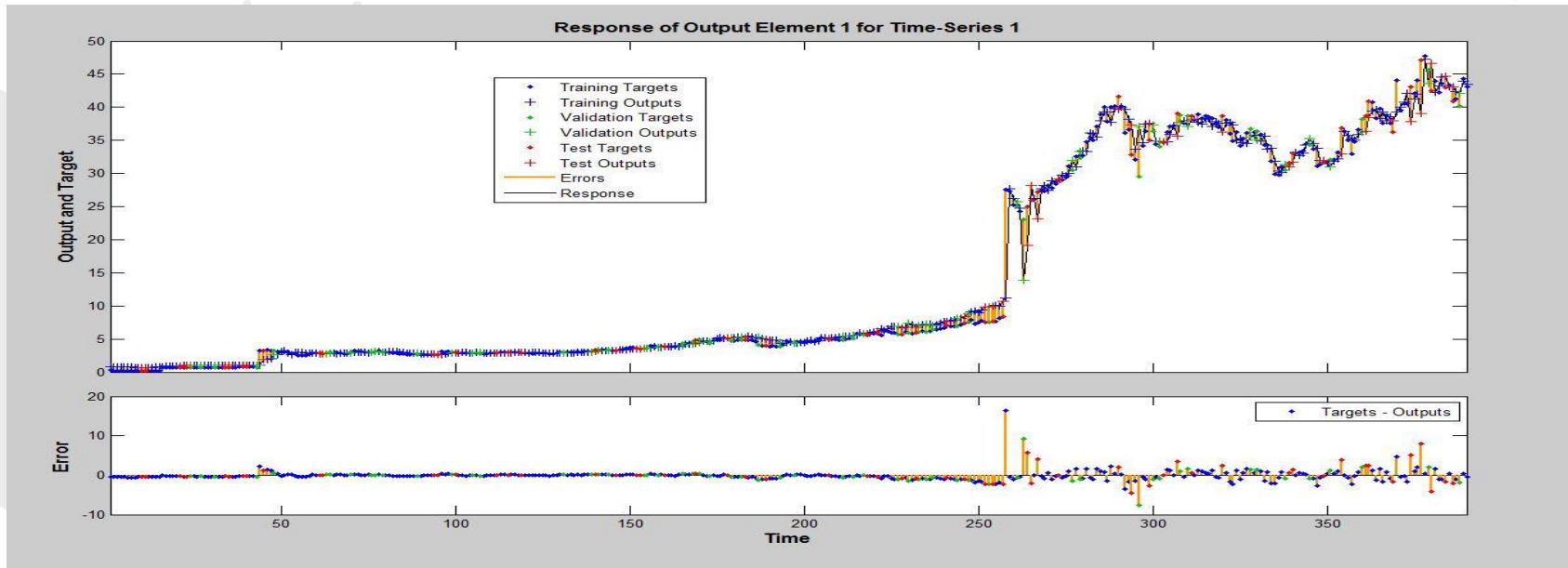
Stock: ITC - BSE ; Default: No. of Neurons: 10

Delay: 2

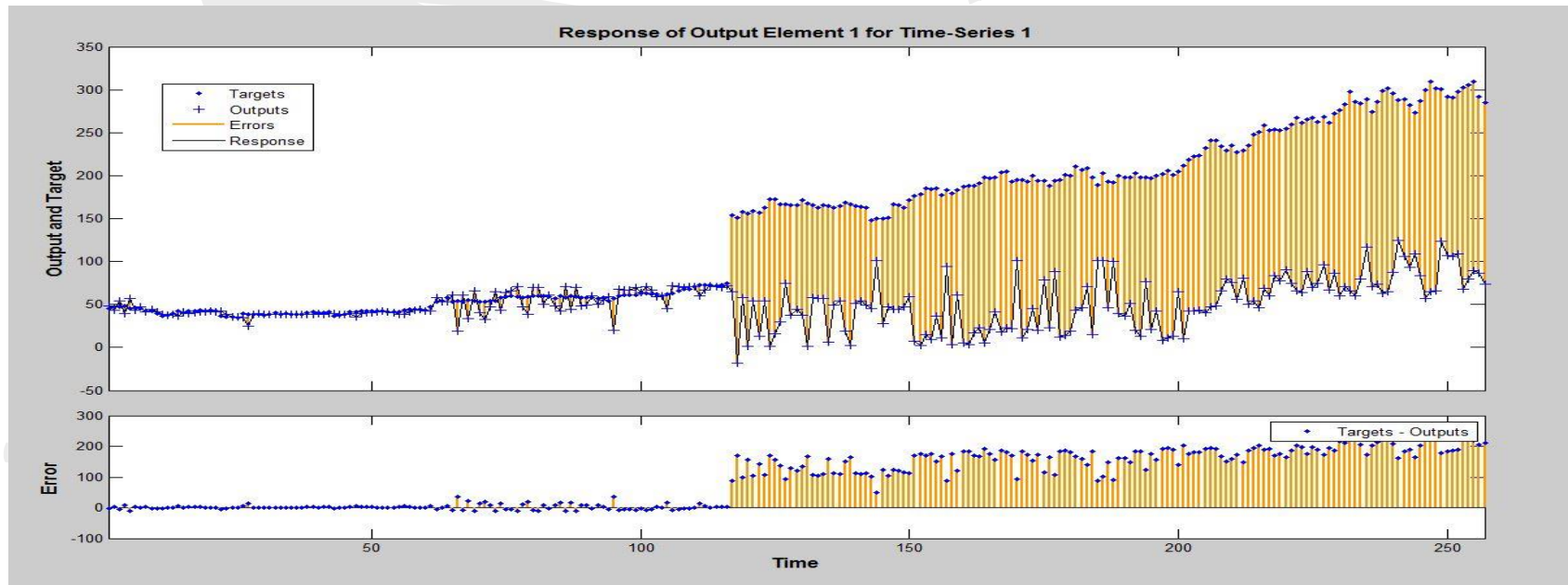
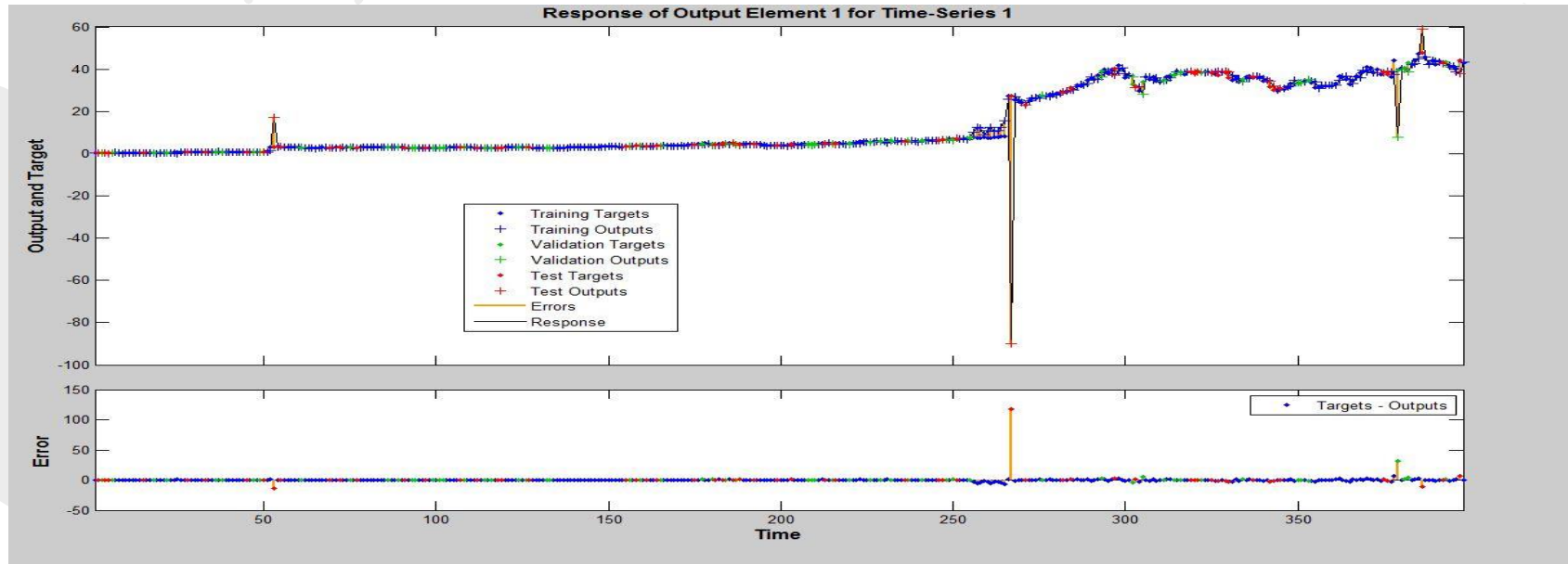


Stock: ITC - BSE ; Default: No. of Neurons: 10

Delay: 10



Stock: ITC - BSE ; Default: No. of Neurons: 100 Delay: 2



Stock: ITC - BSE ; Default: No. of Neurons: 200 Delay: 2

