INTRODUCTION TO

NEURAL NETWORKS

類神經網路簡介

Final Project 2

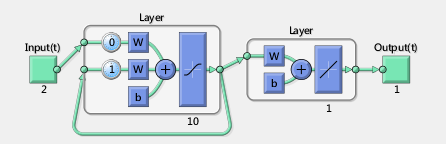
~ Function Approximation ~

|  |  |
| --- | --- |
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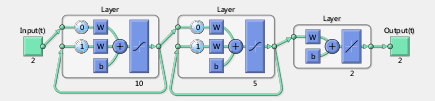
Network Structure:

**MISO Network**



1. Type: Elman backpropagation network
2. Function of Nodes:  
   10 nodes in the hidden layer. The output of each node will be one of the input to the same node in the next train iteration.  
   1 node in the output layer. It gives a linearly summation of all outputs from the hidden layer.
3. Reason of choosing Elman backpropagation network:  
   The structure of Elman backpropagation network can provide a satisfying result in this function approximation problem with a very simple structure.

**MISO Network**

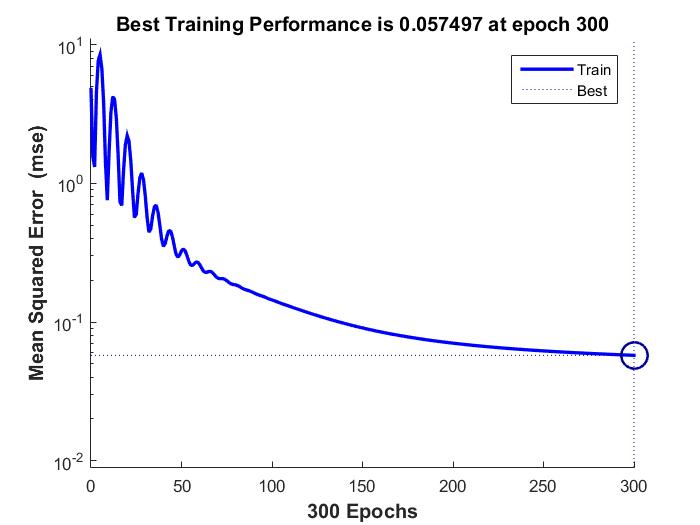


1. Type: Elman backpropagation network
2. Function of Nodes:  
   10 nodes in the first hidden layer and 5 nodes in the second hidden layer.   
   1 node in the output layer. It gives a linearly summation of all outputs from the second hidden layer.
3. Reason of choosing Elman backpropagation network:  
   Same as MISO.

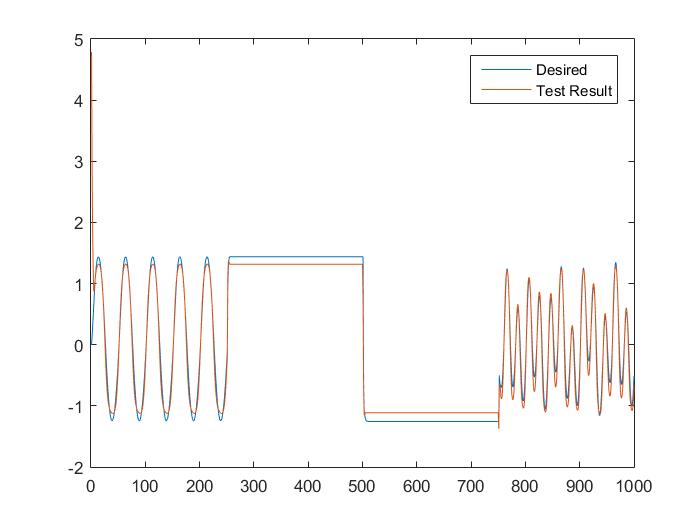
Learning Performance

**MISO Network**

**Learning curve:**



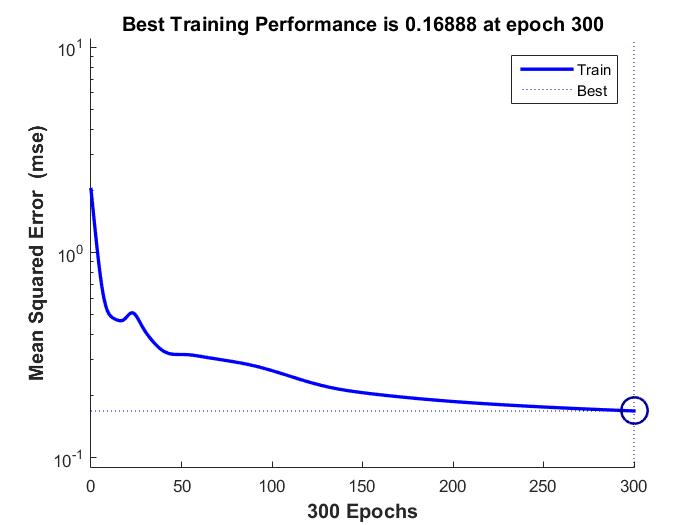
**Test Result:**

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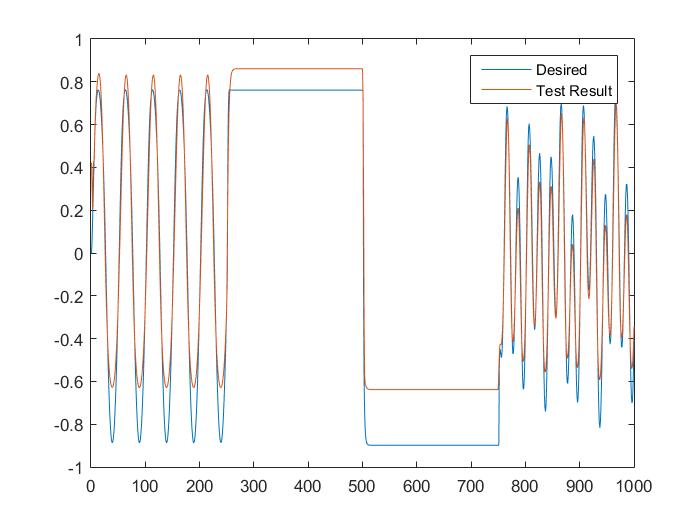
**MSE: 0.1274**

**MIMO Network**

**Learning curve:**

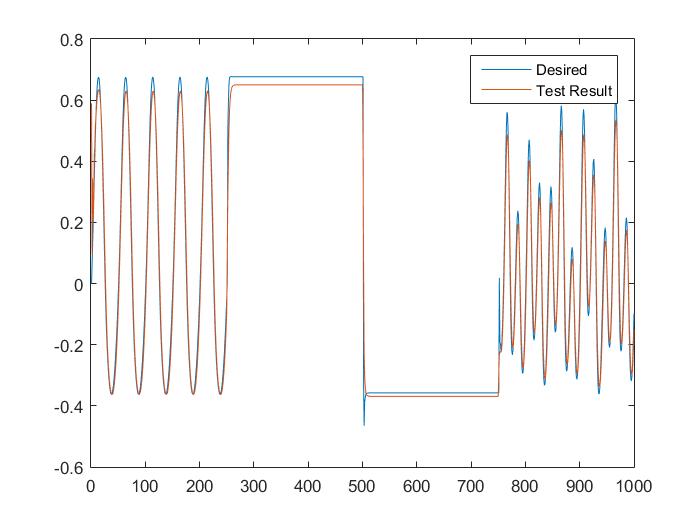


**Test Result of output 1:**

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**MSE of output 1: 0.1370**

**Test Result of output 2:**

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**MSE of output 2: 0.0312**