**Using newrb for analysts’ equity** **forecasts**

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**Abstract:** A neural network (NN), in the case of artificial neurons called artificial neural network (ANN) is an interconnected group of natural or [artificial neurons](http://en.wikipedia.org/wiki/Artificial_neuron) that uses a [mathematical or computational model](http://en.wikipedia.org/wiki/Mathematical_model) for [information processing](http://en.wikipedia.org/wiki/Information_processing) based on a [connectionist](http://en.wikipedia.org/wiki/Connectionism) approach to [computation](http://en.wikipedia.org/wiki/Computation). This study utilizes *newrb* technique. The function *newrb* creates and trains an RBF neural network. In this way, it examines 42 samples from 2005 to 2012. The results shows that the method demonstrate about 99% for train data and test data performance of classification rate.

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**Keywords:**newrb function, artificial neural network.

**1. Introduction**

Neural networks, as used in artificial intelligence, have traditionally been viewed as simplified models of [neural processing](http://en.wikipedia.org/w/index.php?title=Neural_processing&action=edit&redlink=1) in the brain, even though the relation between this model and brain biological architecture is debated, as it is not clear to what degree artificial neural networks mirror brain function.

Recent work has demonstrated that neural networks (NNs) represent an efficient tool for modeling a variety of geophysical transfer functions. Thanks to their non-parametric nature, regression by means of NNs has been successfully applied by different authors (Buckton and O’Mongain 1999, Keiner and Brown 1999, Gross et al. 2000, Cipollini et al. 2001) to model the relationship between satellite-received radiances and OAP concentrations. In this paper, we investigate two different NN architectures and make a comparison of their performances. RBF networks are three-layer networks, whose output nodes form a linear combination of the basic functions (usually of the Gaussian type) computed by the hidden layer nodes. Each node provides a significant non-zero response only when the input falls within a small localized region of the input space.

This study uses different classification methods to find the best solutions and also to create the framework for predicting forecast equity. The objective of this study is to present a model in order to forecast equity from 2005 to 2012 using *newrb.*

**2. Material and Methods**

In the study area used 12 charactristics that is following:

**Table 1**. Chracteristices of input data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Elements | Maximum | Minimum | Average | STDEV |
| Notes receivable | 5253206 | 3885 | 1261087 | 1399529 |
| Inventory | 688701 | 0 | 120072 | 163515 |
| Inventory stock and other inventory | 2542277 | 0 | 636372 | 623930 |
| Advance payment | 2521124 | 39 | 326940 | 655760 |
| Long-term assets | 17363330 | 54030 | 4689123 | 4879249 |
| Notes payable | 5695291 | 16278 | 1478423 | 1763770 |
| prepaid | 3139402 | 3068 | 704671 | 791798 |
| spare parts | 9726510 | 0 | 1653372 | 2447987 |
| Cash | 1182705 | 900 | 214590 | 308493 |
| Long-term liability | 3001470 | 0 | 368339 | 759892 |
| Short-term investments | 3564611 | -3868050 | 270927 | 1794244 |
| equity | 5253206 | 3885 | 1261087 | 1399529 |

The function newrb iteratively creates a radial basis network one neuron at a time. Neurons are added to the network until the sum-squared error falls beneath an error goal or a maximum number of neurons has been reached. The call for this function is:

*net = newrb(P,T,GOAL,SPREAD)*

The function newrb takes matrices of input and target vectors, P and T, and design parameters GOAL and, SPREAD, and returns the desired network.

The design method of newrb is similar to that of newrbe. The difference is that newrb creates neurons one at a time. At each iteration the input vector that results in lowering the network error the most, is used to create a radbas neuron. The error of the new network is checked, and if low enough newrb is finished. Otherwise the next neuron is added. This procedure is repeated until the error goal is met, or the maximum number of neurons is reached.

designing a radial basis network often takes much less time than training a sigmoid/linear network, and can sometimes result in fewer neurons being used, as can be seen in the next demonstration.

Radial basis networks can be used to approximate functions. newrb adds neurons to the hidden layer of a radial basis network until it meets the specified mean squared error goal.

*net = newrb(P,T,goal,spread,MN,DF) takes two of these arguments,*

*P R-by-Q matrix of Q input vectors*

*T S-by-Q matrix of Q target class vectors*

*goal Mean squared error goal (default = 0.0)*

*spread Spread of radial basis functions (default = 1.0)*

*MN Maximum number of neurons (default is Q)*

*DF Number of neurons to add between displays (default = 25)*

**3. Results**

in the study used newrb function the show in thhe following:

*NEWRB, neurons = 0, MSE = 0.506321*

*NEWRB, neurons = 2, MSE = 0.0496654*

*NEWRB, neurons = 3, MSE = 0.0103193*

*NEWRB, neurons = 4, MSE = 0.00296928*

*NEWRB, neurons = 5, MSE = 0.00249247*

*NEWRB, neurons = 6, MSE = 0.0024331*

*NEWRB, neurons = 7, MSE = 0.00238815*

*NEWRB, neurons = 8, MSE = 0.00235325*

*NEWRB, neurons = 9, MSE = 0.00234853*

*NEWRB, neurons = 10, MSE = 0.00233756*

*NEWRB, neurons = 11, MSE = 0.00233661*

*NEWRB, neurons = 12, MSE = 0.00232898*

*NEWRB, neurons = 13, MSE = 0.00232898*

*NEWRB, neurons = 14, MSE = 0.00232896*

*NEWRB, neurons = 15, MSE = 0.0023241*

*NEWRB, neurons = 16, MSE = 0.0023241*

*NEWRB, neurons = 17, MSE = 0.00232412*

*NEWRB, neurons = 18, MSE = 0.00232412*

*NEWRB, neurons = 19, MSE = 0.00232415*

*NEWRB, neurons = 20, MSE = 0.00232415*

*NEWRB, neurons = 21, MSE = 0.00232418*

*NEWRB, neurons = 22, MSE = 0.00232418*

*NEWRB, neurons = 23, MSE = 0.00232405*

*NEWRB, neurons = 24, MSE = 0.00232405*

*NEWRB, neurons = 25, MSE = 0.00232406*

*NEWRB, neurons = 26, MSE = 0.00232406*

*NEWRB, neurons = 27, MSE = 0.00232407*

*NEWRB, neurons = 28, MSE = 0.00232407*

*NEWRB, neurons = 29, MSE = 0.00232407*

*NEWRB, neurons = 30, MSE = 0.00232407*

*NEWRB, neurons = 31, MSE = 0.00232407*

*NEWRB, neurons = 32, MSE = 0.00232407*

*NEWRB, neurons = 33, MSE = 0.00232407*

*NEWRB, neurons = 34, MSE = 0.00232407*

*NEWRB, neurons = 35, MSE = 0.00232407*

*NEWRB, neurons = 36, MSE = 0.00232407*

*NEWRB, neurons = 37, MSE = 0.00232408*

*NEWRB, neurons = 38, MSE = 0.00232408*

*NEWRB, neurons = 39, MSE = 0.00232408*

*NEWRB, neurons = 40, MSE = 0.00232408*

*NEWRB, neurons = 41, MSE = 0.00232408*

*NEWRB, neurons = 42, MSE = 0.00232408*

*NEWRB, neurons = 43, MSE = 0.00232408*

*NEWRB, neurons = 44, MSE = 0.00232408*

*NEWRB, neurons = 45, MSE = 0.00232408*

*NEWRB, neurons = 46, MSE = 0.00232408*

*NEWRB, neurons = 47, MSE = 0.00232408*

*NEWRB, neurons = 48, MSE = 0.00232408*

*NEWRB, neurons = 49, MSE = 0.00232408*

*NEWRB, neurons = 50, MSE = 0.00232408*

*NEWRB, neurons = 51, MSE = 0.00232372*

*NEWRB, neurons = 52, MSE = 0.0023238*

*NEWRB, neurons = 53, MSE = 0.0023238*

*NEWRB, neurons = 54, MSE = 0.0023238*

*NEWRB, neurons = 55, MSE = 0.00232379*

*NEWRB, neurons = 56, MSE = 0.00232379*

*NEWRB, neurons = 57, MSE = 0.00232379*

*NEWRB, neurons = 58, MSE = 0.00232378*

*NEWRB, neurons = 59, MSE = 0.00232378*

*NEWRB, neurons = 60, MSE = 0.00232378*

*NEWRB, neurons = 61, MSE = 0.00232378*

*NEWRB, neurons = 62, MSE = 0.00232378*

*NEWRB, neurons = 63, MSE = 0.00232378*

*NEWRB, neurons = 64, MSE = 0.00232378*

*NEWRB, neurons = 65, MSE = 0.00232378*

*NEWRB, neurons = 66, MSE = 0.00232378*

*NEWRB, neurons = 67, MSE = 0.00232378*

*NEWRB, neurons = 68, MSE = 0.00232378*

*NEWRB, neurons = 69, MSE = 0.00232378*

*NEWRB, neurons = 70, MSE = 0.00232378*

*NEWRB, neurons = 71, MSE = 0.00232378*

*NEWRB, neurons = 72, MSE = 0.00232378*

*NEWRB, neurons = 73, MSE = 0.00232378*

*NEWRB, neurons = 74, MSE = 0.00232378*

*NEWRB, neurons = 75, MSE = 0.00232233*

*NEWRB, neurons = 76, MSE = 0.00232233*

*NEWRB, neurons = 77, MSE = 0.00232232*

*NEWRB, neurons = 78, MSE = 0.00232269*

*NEWRB, neurons = 79, MSE = 0.00232269*

*NEWRB, neurons = 80, MSE = 0.00232269*

*NEWRB, neurons = 81, MSE = 0.00232268*

*NEWRB, neurons = 82, MSE = 0.00232268*

*NEWRB, neurons = 83, MSE = 0.00232269*

*NEWRB, neurons = 84, MSE = 0.00232269*

*NEWRB, neurons = 85, MSE = 0.00232267*

*NEWRB, neurons = 86, MSE = 0.00232267*

*NEWRB, neurons = 87, MSE = 0.00232267*

*NEWRB, neurons = 88, MSE = 0.00232267*

*NEWRB, neurons = 89, MSE = 0.00232267*

*NEWRB, neurons = 90, MSE = 0.00232263*

*NEWRB, neurons = 91, MSE = 0.00232263*

*NEWRB, neurons = 92, MSE = 0.00232262*

*NEWRB, neurons = 93, MSE = 0.00232262*

*NEWRB, neurons = 94, MSE = 0.00232261*

*NEWRB, neurons = 95, MSE = 0.00232253*

*NEWRB, neurons = 96, MSE = 0.00232253*

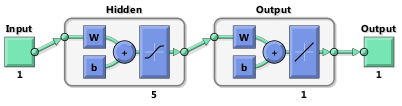
*NEWRB, neurons = 97, MSE = 0.00232253*

*NEWRB, neurons = 98, MSE = 0.00232253*

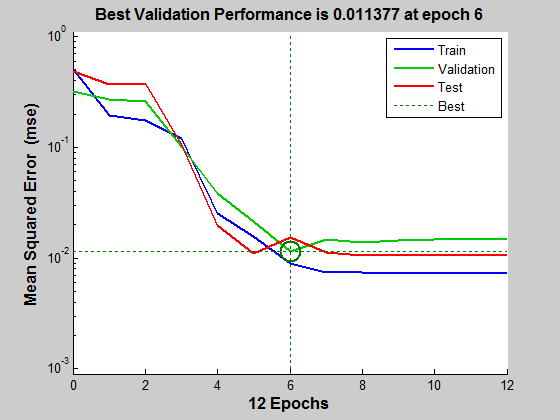
*NEWRB, neurons = 99, MSE = 0.00232255*

*NEWRB, neurons = 100, MSE = 0.00232255*

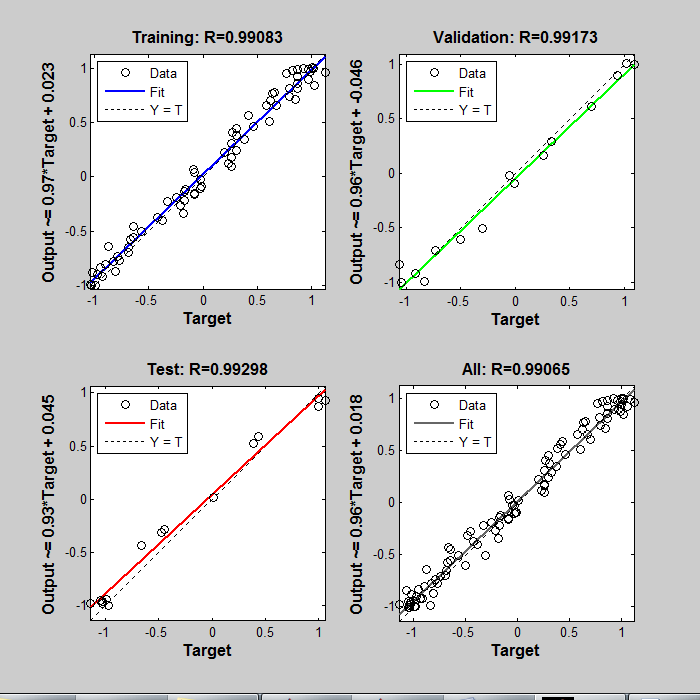
The results of the recearch is show in Figure 1 to Figure 4.



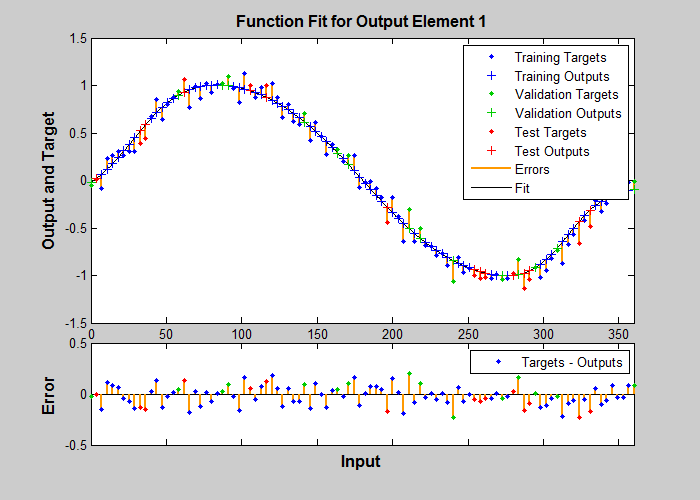
**Figure 1**. *newrb* for the research to forecast equity



**Figure 2.** Best validation performance for the research to forecast equity



**Figure 3**. The results of the *newrb* method for to forecast equity



**Figure 4.** Function fit for outputs elements (equity)

**4. Discussions**

In the research were used 11 input that involve Cash، Short-Term Investments، Notes Receivable, Inventory، Spare Parts, Inventory Stock and Other Inventory, Advance Payment, Long-Term Assets, Notes Payable, Prepaid, Long-Term Liability that applied for clustering equity. For predicting forecast equity used newrb method. According to results, the method demonstrate about 99% for train data and test data performance of classification rate.

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