

Tables

Data Signal	Dates	Number of data points
Oil Price	01/01/1985 to 01/11/2008	389
IBM	17/05/1961 to 02/11/1962	360
US/Euro rate	03/01/2000 to 04/11/2005	1525

Table 1: Time series data used in the experiments

Metrics	Calculations
Annualized Return (AR)	$AR = 252 * \frac{1}{n} \sum_{i=1}^n R_i$ $R_i = \begin{cases} y_i & (y_i - \hat{y}_i) \geq 0 \\ - y_i & otherwise \end{cases}$
Maximum Drawdown (MD)	$MD = Min \left(\sum_{i=1}^n CP_{i-1} - Max(CP_1, \dots, CP_i) \right)$ <p>where</p> $CP = \sum_{i=1}^n \hat{y}_i(t)$
Signal to Noise Ratio (SNR)	$SNR = 10 * \log_{10}(\sigma)$ $\sigma = \frac{m^2 * n}{SSE}$ $SSE = \sum_{i=1}^n (y_i - \hat{y}_i)^2$ $m = \max(y)$
Normalized Mean Square Error (NMSE)	$NMSE = \frac{1}{\sigma^2 n} \sum_{i=1}^n (y_i - \hat{y}_i)^2$ $\sigma^2 = \frac{1}{n-1} \sum_{i=1}^n (y_i - \bar{y})^2$ $\bar{y} = \frac{1}{n} \sum_{i=1}^n y_i$
Annualized Volatility (AV)	$AV = \frac{\sigma}{\sqrt{252}}$ <p>where</p> $\sigma = \sqrt{\frac{\sum_{i=1}^n y_i^2}{n} - \left(\frac{\sum_{i=1}^n y_i}{n} \right)^2}$

n is the total number of data patterns

y and \hat{y} represent the actual and predicted output value

Table 2: Signal processing and trading simulation performance measures.

Step Ahead Prediction	Oil Price	IBM Stock Value	US/Euro Exchange Rate
1	0.2075	0.4471	1.2342
2	0.2411	0.4335	1.3486
10	0.2591	0.4802	1.425
15	0.2658	0.5169	1.5107
Mean MSE	0.243375	0.469425	1.379625

Table 3: 1,5,10 and 15 step ahead prediction Mean Squared Error for the Linear Predictor Classifier.

Step Ahead Prediction	Oil Price	IBM Stock Value	US/Euro Exchange Rate
1	28.6086	26.4725	25.9932
2	28.1832	26.5651	25.7979
10	28.0913	26.0978	25.7307
15	28.3049	25.8201	25.6745
Mean SNR	28.297	26.23888	25.79908

Table 4: 1,5,10 and 15 step ahead prediction Signal to Noise Ratio for the Linear Predictor Classifier.

Measure	Network	Oil Price	IBM	US/Euro rate
AR	LPC	-19.4035	-5.5758	15.1846
	MLP	2.6385	1.6523	2.9824
	DRPNN	14.6108	-0.2958	8.63152
	PSN	94.5051	96.2261	27.162
SNR	LPC	28.1832	26.5651	25.7979
	MLP	15.06	7.87	16.21
	RPNN	22.98	18.43	20.52
	PSN	30.1939	92.3077	81.6514
NMSE	LPC	0.2411	0.4335	1.3486
	MLP	3.3703	10.7787	1.1719
	DRPNN	0.6098	0.9437	0.4337
	PSN	0.0883	0.0662	14.5187
AV	LPC	180.2314	94.4259	1.0142
	MLP	17.7153	20.1867	10.8801
	DRPNN	17.6485	20.1777	10.8731
	PSN	55.8574	65.0968	20.9892

Table 5: 5-step time-series prediction results.