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# Appendices

# **Appendix A**

## **Training Investigation Results**

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**Table A.1** MSE results for data set I trained with BP

Hidden Nodes	Weight Initialisation					Average	Standard Deviation
	1	2	3	4	5		
1	<b>0.453</b>	<b>0.453</b>	<b>0.453</b>	<b>0.453</b>	<b>0.453</b>	0.453	0.000
2	0.448	<b>0.438</b>	0.448	0.448	<b>0.438</b>	0.444	0.005
3	0.443	<b>0.434</b>	0.442	0.440	0.435	0.439	0.004
4	0.427	0.427	0.429	0.433	<b>0.418</b>	<b>0.427</b>	0.006
5	<b>0.417</b>	0.431	0.421	0.425	0.427	0.424	0.005
6	<b>0.412</b>	<b>0.412</b>	0.413	0.418	0.416	<b>0.414</b>	0.003
7	0.410	0.412	0.407	<b>0.398</b>	0.412	0.408	0.006
8	0.403	0.414	0.406	<b>0.400</b>	0.404	0.405	0.005
9	0.393	0.406	<b>0.377</b>	0.388	0.406	<b>0.394</b>	0.013
10	0.396	0.388	0.386	<b>0.374</b>	0.392	<b>0.387</b>	0.008

**Table A.2** MSE results for data set I trained with the GA

Hidden Nodes	Weight Initialisation					Average	Standard Deviation
	1	2	3	4	5		
1	<b>0.450</b>	<b>0.450</b>	<b>0.450</b>	<b>0.450</b>	<b>0.450</b>	0.450	0.000
2	<b>0.438</b>	<b>0.438</b>	<b>0.438</b>	<b>0.438</b>	<b>0.438</b>	<b>0.438</b>	0.000
3	0.440	0.442	<b>0.436</b>	0.438	0.438	0.439	0.002
4	0.431	0.435	<b>0.430</b>	0.434	0.433	0.433	0.002
5	0.431	0.435	<b>0.427</b>	0.430	0.442	0.433	0.006
6	0.431	0.430	<b>0.418</b>	0.429	0.420	0.425	0.006
7	0.425	<b>0.408</b>	0.422	0.423	0.430	0.422	0.008
8	<b>0.404</b>	0.414	0.410	0.424	0.411	0.413	0.007
9	0.424	0.419	<b>0.404</b>	0.406	0.406	0.412	0.009
10	0.399	0.403	<b>0.395</b>	0.405	0.428	0.406	0.013

**Table A.3** MSE results for data set I trained with the SCE-UA algorithm

Hidden Nodes	Weight Initialisation					Average	Standard Deviation
	1	2	3	4	5		
1	<b>0.448</b>	<b>0.448</b>	<b>0.448</b>	<b>0.448</b>	<b>0.448</b>	<b>0.448</b>	0.000
2	<b>0.438</b>	<b>0.438</b>	<b>0.438</b>	<b>0.438</b>	<b>0.438</b>	<b>0.438</b>	0.000
3	0.434	0.435	0.436	<b>0.426</b>	0.436	<b>0.433</b>	0.004
4	<b>0.422</b>	0.429	0.431	0.428	0.427	<b>0.427</b>	0.004
5	<b>0.412</b>	0.427	0.426	0.419	0.416	<b>0.420</b>	0.006
6	<b>0.411</b>	0.419	0.423	0.421	0.415	0.418	0.005
7	0.410	<b>0.401</b>	0.416	0.402	0.403	<b>0.407</b>	0.007
8	<b>0.390</b>	0.401	0.400	0.400	0.393	<b>0.397</b>	0.005
9	0.400	0.395	<b>0.391</b>	0.396	0.395	0.396	0.003
10	<b>0.386</b>	0.405	0.394	0.403	0.396	0.397	0.007

**Table A.4** MSE results for data set II trained with BP

Hidden Nodes	Weight Initialisation					Average	Standard Deviation
	1	2	3	4	5		
1	<b>0.641</b>	<b>0.641</b>	<b>0.641</b>	<b>0.641</b>	<b>0.641</b>	0.641	0.000
2	0.631	<b>0.558</b>	0.631	<b>0.558</b>	0.631	<b>0.602</b>	0.040
3	0.629	0.606	<b>0.485</b>	0.622	0.548	0.578	0.061
4	0.497	0.521	<b>0.478</b>	0.589	0.511	0.519	0.042
5	0.471	<b>0.463</b>	0.531	0.536	0.492	0.498	0.034
6	<b>0.458</b>	0.466	0.515	0.464	0.470	0.475	0.023
7	0.463	0.448	0.468	<b>0.438</b>	0.451	<b>0.454</b>	0.012
8	0.448	0.449	<b>0.433</b>	0.484	0.435	<b>0.450</b>	0.020
9	0.432	0.434	0.488	0.429	<b>0.420</b>	<b>0.441</b>	0.027
10	0.424	0.434	<b>0.414</b>	0.446	0.425	<b>0.429</b>	0.012

**Table A.5** MSE results for data set II trained with the GA

Hidden Nodes	Weight Initialisation					Average	Standard Deviation
	1	2	3	4	5		
1	0.641	0.641	0.641	0.641	<b>0.640</b>	0.641	0.000
2	0.633	0.634	0.633	<b>0.609</b>	0.617	0.625	0.011
3	0.527	0.610	0.629	0.537	<b>0.515</b>	0.564	0.052
4	0.625	0.538	0.498	0.506	<b>0.481</b>	0.529	0.057
5	0.485	0.486	0.479	0.493	<b>0.474</b>	0.483	0.007
6	<b>0.459</b>	0.526	<b>0.459</b>	0.477	0.470	0.478	0.028
7	0.482	0.459	<b>0.456</b>	0.463	0.464	0.465	0.010
8	0.487	<b>0.453</b>	0.454	0.478	0.471	0.469	0.015
9	0.447	0.475	0.465	0.447	<b>0.446</b>	0.456	0.013
10	0.460	0.460	<b>0.445</b>	0.447	0.448	0.452	0.007

**Table A.6** MSE results for data set II trained with the SCE-UA algorithm

Hidden Nodes	Weight Initialisation					Average	Standard Deviation
	1	2	3	4	5		
1	<b>0.639</b>	<b>0.639</b>	<b>0.639</b>	<b>0.639</b>	<b>0.639</b>	<b>0.639</b>	0.000
2	<b>0.629</b>	0.632	<b>0.629</b>	<b>0.629</b>	0.632	0.630	0.001
3	0.621	0.620	<b>0.480</b>	<b>0.480</b>	<b>0.480</b>	<b>0.536</b>	0.077
4	<b>0.471</b>	0.473	0.473	0.477	0.473	<b>0.473</b>	0.002
5	0.467	<b>0.465</b>	0.506	0.468	0.469	<b>0.475</b>	0.018
6	0.460	0.462	0.462	<b>0.459</b>	0.463	<b>0.461</b>	0.002
7	0.459	0.453	<b>0.450</b>	0.454	0.492	0.462	0.017
8	<b>0.447</b>	<b>0.447</b>	0.451	0.455	0.450	0.450	0.004
9	0.449	<b>0.445</b>	0.446	0.462	0.459	0.452	0.008
10	0.440	0.470	0.446	0.444	<b>0.433</b>	0.447	0.014

**Table A.7** MSE results for data set III trained with BP

Hidden Nodes	Weight Initialisation					Average	Standard Deviation
	1	2	3	4	5		
1	<b>3.543</b>	<b>3.543</b>	<b>3.543</b>	<b>3.543</b>	<b>3.543</b>	3.543	0.000
2	2.592	2.592	<b>2.403</b>	<b>2.403</b>	3.030	2.604	0.256
3	1.693	<b>1.419</b>	<b>1.419</b>	2.004	1.693	<b>1.646</b>	0.243
4	1.652	<b>0.653</b>	<b>0.653</b>	1.646	<b>0.653</b>	1.051	0.546
5	<b>0.559</b>	<b>0.559</b>	0.635	<b>0.559</b>	0.580	0.579	0.033
6	0.558	0.575	0.582	<b>0.521</b>	0.536	0.554	0.026
7	<b>0.516</b>	0.531	0.553	0.558	0.519	0.535	0.019
8	0.582	0.517	0.518	<b>0.509</b>	0.522	0.530	0.030
9	0.523	0.512	0.513	<b>0.502</b>	0.518	<b>0.514</b>	0.008
10	<b>0.489</b>	0.506	0.497	0.497	0.501	<b>0.498</b>	0.006

**Table A.8** MSE results for data set III trained with the GA

Hidden Nodes	Weight Initialisation					Average	Standard Deviation
	1	2	3	4	5		
1	<b>3.540</b>	3.541	<b>3.540</b>	<b>3.540</b>	<b>3.541</b>	3.541	0.000
2	2.551	2.554	2.417	2.544	<b>2.414</b>	2.496	0.074
3	2.524	<b>1.449</b>	1.730	2.480	1.732	1.983	0.488
4	1.858	0.756	0.942	0.752	<b>0.737</b>	<b>1.009</b>	0.482
5	0.644	0.639	0.738	<b>0.603</b>	0.643	0.653	0.050
6	0.693	<b>0.536</b>	0.601	0.611	0.625	0.613	0.056
7	0.605	0.560	<b>0.549</b>	0.639	0.637	0.598	0.042
8	0.631	0.571	0.605	0.561	<b>0.540</b>	0.582	0.036
9	0.572	<b>0.539</b>	0.546	0.556	0.558	0.554	0.013
10	<b>0.531</b>	0.544	<b>0.531</b>	0.541	0.557	0.541	0.011

**Table A.9** MSE results for data set III trained with the SCE-UA algorithm

Hidden Nodes	Weight Initialisation					Average	Standard Deviation
	1	2	3	4	5		
1	<b>3.538</b>	<b>3.538</b>	<b>3.538</b>	<b>3.538</b>	<b>3.538</b>	<b>3.538</b>	0.000
2	<b>2.356</b>	<b>2.356</b>	<b>2.356</b>	<b>2.356</b>	<b>2.356</b>	<b>2.356</b>	0.000
3	<b>1.656</b>	<b>1.656</b>	<b>1.656</b>	<b>1.656</b>	<b>1.656</b>	1.656	0.000
4	1.620	<b>0.600</b>	1.627	1.640	<b>0.600</b>	1.218	0.563
5	0.566	0.529	0.545	0.527	<b>0.526</b>	<b>0.539</b>	0.017
6	<b>0.518</b>	0.520	0.567	0.519	0.528	<b>0.530</b>	0.021
7	0.513	0.517	<b>0.511</b>	<b>0.511</b>	0.512	<b>0.513</b>	0.003
8	<b>0.511</b>	0.514	0.537	<b>0.511</b>	0.513	<b>0.517</b>	0.011
9	0.524	<b>0.516</b>	0.520	0.519	<b>0.516</b>	0.519	0.004
10	0.526	0.549	0.538	0.550	<b>0.520</b>	0.537	0.013

# **Appendix B**

## **Results of Assessment of Input Importance Measures**

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In the tables presented in this appendix, the methods used for assessing relative input importance are numbered as follows:

- (1) Connection Weight Approach
- (2) Garson's Method
- (3) Modified Connection Weight Approach
- (4) Modified Garson's Method



**Table B.1** *RI* results for data set I trained by BP.

Hidden Nodes	(1)				(2)				(3)				(4)			
	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	
1	20.71	41.59	37.70	20.71	41.59	37.70	21.24	41.15	37.61	20.71	41.59	37.70	20.71	41.59	37.70	
2	27.43	59.21	13.36	20.66	39.36	39.98	24.27	41.03	34.70	21.11	40.21	38.68	21.11	40.21	38.68	
3	11.76	37.15	51.09	16.35	29.73	53.92	15.58	45.73	38.70	14.11	37.24	48.65	14.11	37.24	48.65	
4	22.55	42.59	34.86	20.93	38.33	40.75	21.96	39.60	38.45	21.09	40.04	38.87	21.09	40.04	38.87	
5	50.30	14.64	35.06	31.46	31.73	36.81	22.98	37.19	39.83	18.57	48.60	32.83	18.57	48.60	32.83	
6	34.09	44.65	21.26	30.93	36.22	32.86	29.46	62.92	7.62	69.83	27.19	2.98	69.83	27.19	2.98	
7	42.87	50.53	6.60	21.29	47.64	31.08	33.48	48.58	17.93	32.92	48.91	18.17	32.92	48.91	18.17	
8	26.69	57.77	15.53	27.04	39.24	33.72	31.97	51.58	16.45	27.09	50.87	22.04	27.09	50.87	22.04	
9	31.12	31.29	37.60	35.77	31.22	33.01	21.69	44.55	33.75	19.39	49.97	30.64	19.39	49.97	30.64	
10	1.62	33.52	64.87	18.89	38.80	42.31	8.48	37.44	54.09	4.75	32.39	62.85	4.75	32.39	62.85	
Mean	26.91	41.29	31.79	24.40	37.38	38.21	23.11	44.98	31.91	24.96	41.70	33.34	24.96	41.70	33.34	
St. Dev.	14.14	13.25	17.97	6.44	5.41	6.68	7.49	7.86	13.79	17.41	7.99	16.57	17.41	7.99	16.57	

**Table B.2** *RI* results for data set I trained by GA.

Hidden Nodes	(1)			(2)			(3)			(4)		
	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$
1	20.76	41.85	37.39	20.76	41.85	37.39	21.27	41.40	37.33	20.76	41.85	37.39
2	17.69	43.74	38.57	24.46	39.82	35.73	18.33	42.89	38.78	20.46	41.92	37.62
3	20.14	42.90	36.96	28.40	38.30	33.30	19.02	42.78	38.20	17.28	44.24	38.48
4	24.07	44.24	31.69	25.28	42.26	32.46	19.54	44.64	35.82	19.38	45.50	35.12
5	19.72	43.61	36.67	19.05	52.58	28.37	20.96	40.02	39.01	16.22	47.95	35.83
6	19.69	38.99	41.32	38.74	33.57	27.68	22.12	40.78	37.10	24.81	42.85	32.35
7	22.18	38.70	39.12	32.38	41.31	26.30	22.36	38.47	39.17	22.40	42.27	35.32
8	25.99	42.61	31.40	28.04	37.44	34.52	28.08	42.18	29.75	27.74	44.42	27.84
9	20.09	37.40	42.51	33.73	27.02	39.25	19.49	42.59	37.92	21.04	35.66	43.30
10	28.08	38.35	33.57	19.54	50.55	29.91	30.50	36.06	33.44	40.41	26.63	32.96
Mean	21.84	41.24	36.92	27.04	40.47	32.49	22.17	41.18	36.65	23.05	41.33	35.62
St. Dev.	3.24	2.59	3.76	6.52	7.43	4.34	4.02	2.48	2.98	6.96	6.07	4.12

**Table B.3** *RI* results for data set I trained by SCE-UA.

Hidden Nodes	(1)			(2)			(3)			(4)		
	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$
1	20.75	41.81	37.45	20.75	41.81	37.45	21.21	41.40	37.39	20.75	41.81	37.45
2	19.29	43.12	37.59	19.09	43.27	37.65	21.09	41.31	37.60	19.09	43.27	37.65
3	20.32	41.99	37.68	21.15	41.80	37.05	20.94	41.11	37.95	16.92	44.04	39.03
4	20.44	42.67	36.90	19.90	42.75	37.36	21.01	41.89	37.10	19.90	42.75	37.36
5	19.71	43.27	37.02	19.63	42.09	38.28	19.84	42.26	37.89	18.39	42.74	38.87
6	19.74	44.26	36.00	16.87	47.99	35.14	20.87	43.81	35.32	18.35	50.89	30.76
7	19.22	43.10	37.68	21.02	40.40	38.59	19.45	42.59	37.96	19.23	41.02	39.75
8	23.28	41.48	35.25	23.83	42.19	33.99	23.25	41.30	35.45	20.41	44.08	35.51
9	19.53	44.03	36.44	17.06	49.35	33.60	19.31	44.20	36.49	11.93	55.21	32.85
10	22.01	41.67	36.31	31.96	36.17	31.87	21.61	42.04	36.35	21.36	45.80	32.84
Mean	20.43	42.74	36.83	21.13	42.78	36.10	20.86	42.19	36.95	18.63	45.16	36.21
St. Dev.	1.30	0.98	0.82	4.31	3.69	2.29	1.15	1.07	1.00	2.69	4.48	3.08

**Table B.4** *RJ* results for data set II trained by BP.

Hidden Nodes	(1)			(2)			(3)			(4)						
	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$
3	8.51	13.26	10.51	67.73	10.18	18.56	19.02	52.23	26.04	40.04	31.52	2.40	20.98	38.24	37.94	2.84
4	11.94	19.96	18.14	49.95	8.47	15.38	15.76	60.39	21.81	34.37	30.42	13.40	19.25	34.96	34.26	11.52
5	17.75	31.67	28.11	22.46	8.19	15.00	14.16	62.65	23.04	35.69	32.43	8.85	18.18	33.28	31.43	17.11
6	8.38	26.03	18.07	47.52	10.31	13.87	15.62	60.20	21.15	36.98	32.17	9.70	18.85	32.58	32.49	16.07
7	15.25	36.28	17.86	30.61	9.22	16.77	18.21	55.81	23.03	45.07	28.21	3.68	14.29	38.18	22.53	25.00
8	15.17	21.98	15.70	47.15	7.59	12.45	12.42	67.55	20.93	37.06	27.63	14.38	13.70	26.35	23.17	36.78
9	12.49	34.91	21.91	30.69	10.57	14.71	14.98	59.74	11.33	49.34	34.57	4.75	6.34	35.59	28.94	29.14
10	12.40	22.43	19.98	45.19	11.28	22.62	14.54	51.56	21.96	38.67	29.25	10.13	17.59	32.27	30.07	20.08
Mean	12.74	25.82	18.78	42.66	9.48	16.17	15.59	58.76	21.16	39.65	30.78	8.41	16.15	33.93	30.10	19.82
St. Dev.	3.28	7.97	5.04	14.28	1.31	3.18	2.15	5.36	4.28	5.10	2.35	4.43	4.66	3.83	5.25	10.55

**Table B.5** *RI* results for data set II trained by GA.

Hidden Nodes	(1)			(2)			(3)			(4)						
	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$
3	9.35	17.14	19.23	54.28	7.46	15.79	14.56	62.18	19.36	34.64	37.93	8.08	17.70	34.72	33.52	14.07
4	8.83	13.82	11.16	66.19	7.60	14.98	14.52	62.90	26.50	41.02	31.51	0.96	19.54	38.50	33.59	8.38
5	11.84	20.13	17.54	50.49	7.78	15.01	13.18	64.02	23.56	36.38	27.31	12.75	18.91	35.11	30.22	15.76
6	16.99	34.08	30.19	18.74	6.92	15.39	11.98	65.71	20.63	37.06	32.77	9.54	18.43	32.14	31.06	18.38
7	11.63	18.04	17.89	52.44	9.79	16.48	16.75	56.98	22.96	32.10	29.52	15.42	18.05	35.05	32.90	14.00
8	6.70	14.15	10.21	68.95	8.48	12.54	18.87	60.11	19.09	37.80	36.02	7.09	15.84	29.52	19.66	34.97
9	24.81	56.87	18.10	0.22	8.25	18.11	14.04	59.60	24.24	43.09	16.76	15.90	29.86	42.63	23.13	4.38
10	16.52	27.46	22.92	33.09	11.61	17.36	13.38	57.65	23.87	38.36	26.72	11.05	18.72	32.40	34.43	14.45
Mean	13.33	25.21	18.40	43.05	8.49	15.71	14.66	61.15	22.53	37.56	29.82	10.10	19.63	35.01	29.81	15.55
St. Dev.	5.86	14.54	6.33	23.91	1.52	1.70	2.19	3.08	2.60	3.45	6.57	4.88	4.28	4.06	5.46	9.00

**Table B.6** *RI* results for data set II trained by SCE-UA.

Hidden	(1)			(2)			(3)			(4)						
	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$	$y_{t-1}$	$y_{t-4}$	$y_{t-9}$	$x_t$
3	9.49	13.08	11.30	66.13	10.07	18.85	19.14	51.94	27.31	37.86	32.74	2.09	17.42	32.59	33.09	16.91
4	11.26	17.54	14.62	56.58	10.52	19.22	19.89	50.37	24.84	36.68	30.44	8.04	21.17	38.68	39.36	0.79
5	10.96	19.25	16.76	53.03	8.92	15.97	16.98	58.13	23.01	37.03	31.41	8.56	18.30	32.94	32.10	16.66
6	15.29	38.03	5.66	41.02	7.55	15.73	17.68	59.04	23.39	39.17	22.90	14.55	20.18	42.04	28.91	8.87
7	15.83	13.67	0.43	70.07	18.39	31.04	18.08	32.50	38.83	29.46	20.28	11.42	30.92	34.27	21.49	13.32
8	12.98	21.57	21.08	44.37	8.36	17.03	12.11	62.50	20.83	33.50	32.87	12.80	16.31	33.80	28.86	21.03
9	16.78	27.79	24.91	30.53	8.73	13.13	15.13	63.01	24.79	36.46	31.83	6.93	17.27	31.51	30.02	21.21
10	13.86	26.19	17.92	42.04	8.81	20.18	18.16	52.85	25.44	36.72	27.78	10.06	17.74	34.20	33.30	14.76
Mean	13.31	22.14	14.09	50.47	10.17	18.89	17.15	53.79	26.05	35.86	28.78	9.31	19.91	35.01	30.89	14.19
St. Dev.	2.59	8.32	8.05	13.46	3.45	5.40	2.48	9.83	5.50	3.04	4.77	3.87	4.73	3.55	5.09	6.75

**Table B.7** *RI* results for data set III trained by BP.

Hidden Nodes	(1)					(2)					(3)					(4)				
	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$
5	12.75	10.82	19.59	37.25	19.58	30.80	32.26	26.08	6.96	3.89	13.55	17.67	7.36	40.23	21.20	11.29	5.90	14.35	44.13	24.33
6	12.54	31.84	2.54	35.82	17.27	33.39	26.68	25.78	8.91	5.25	13.89	30.73	0.63	36.82	17.93	1.43	27.44	7.79	40.62	22.72
7	6.74	6.75	4.92	54.42	27.18	37.90	26.57	20.19	10.00	5.34	6.42	16.10	1.30	50.63	25.55	18.60	8.10	5.82	44.71	22.78
8	26.19	31.25	2.09	28.28	12.19	31.67	30.98	25.62	7.35	4.38	19.59	17.11	2.28	41.85	19.16	16.35	9.93	21.56	33.38	18.78
9	24.31	28.32	1.57	34.35	11.45	33.14	33.55	20.67	8.12	4.52	14.62	24.61	6.63	35.29	18.85	18.37	24.94	6.83	31.55	18.31
10	42.55	12.76	2.17	30.39	12.13	36.45	28.05	19.33	10.01	6.16	20.58	16.44	1.49	42.56	18.93	25.96	0.75	7.48	43.21	22.60
Mean	20.85	20.29	5.48	36.75	16.63	33.89	29.68	22.95	8.56	4.92	14.78	20.44	3.28	41.23	20.27	15.33	12.84	10.64	39.60	21.59
St. Dev.	13.00	11.38	7.01	9.29	6.12	2.75	2.99	3.19	1.30	0.81	5.08	5.95	2.93	5.41	2.80	8.29	10.81	6.15	5.73	2.44

**Table B.8** *RI* results for data set III trained by GA.

Hidden	(1)					(2)					(3)					(4)				
	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$
5	21.65	35.24	13.87	18.77	10.48	31.13	28.90	25.74	9.31	4.92	25.19	22.30	3.94	31.09	17.49	6.71	2.98	24.51	42.49	23.31
6	0.12	3.41	1.34	63.33	31.79	27.50	25.41	28.69	11.98	6.42	16.74	5.40	4.53	48.57	24.76	11.22	1.44	11.66	49.27	26.41
7	49.66	2.32	2.23	30.54	15.25	35.32	26.96	20.92	10.53	6.26	34.22	4.31	3.37	38.19	19.90	22.62	5.97	6.53	41.48	23.40
8	32.07	26.48	0.05	26.48	14.92	29.30	33.02	21.11	11.48	5.09	15.97	8.14	2.56	46.36	26.98	6.97	28.24	3.19	40.78	20.82
9	11.15	8.42	5.87	45.92	28.64	32.48	25.40	23.15	13.40	5.57	4.16	5.78	10.26	49.46	30.34	7.76	6.79	3.83	57.33	24.30
10	16.18	6.43	6.10	46.65	24.64	27.70	30.30	26.53	10.13	5.34	6.78	4.58	7.96	52.37	28.31	1.25	16.11	11.99	44.88	25.78
Mean	21.81	13.72	4.91	38.62	20.95	30.57	28.33	24.36	11.14	5.60	17.18	8.42	5.44	44.34	24.63	9.42	10.25	10.29	46.04	24.00
St.	17.30	13.74	5.02	16.34	8.59	3.03	3.01	3.14	1.46	0.62	11.26	6.93	3.01	8.07	5.00	7.21	10.19	7.91	6.33	2.00
Dev.																				



**Table B.9** *RI* results for data set III trained by SCE-UA.

Hidden Nodes	(1)					(2)					(3)					(4)				
	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$
5	11.05	7.95	36.10	29.33	15.57	34.12	35.65	22.61	4.80	2.82	12.25	13.27	23.98	32.97	17.53	9.23	5.40	4.46	52.28	28.63
6	20.06	35.22	2.05	27.53	15.14	33.26	36.58	22.61	4.58	2.96	23.81	19.93	0.09	36.20	19.98	15.97	25.25	21.59	23.08	14.11
7	31.72	36.70	4.84	15.92	10.82	41.63	39.02	10.77	6.29	2.28	27.65	32.28	5.79	20.22	14.07	36.39	30.05	3.93	19.35	10.27
8	18.53	35.00	6.40	26.77	13.30	32.62	29.05	26.59	7.10	4.64	9.42	21.71	5.45	41.82	21.60	24.63	10.02	8.06	36.26	21.03
9	19.07	31.20	6.78	27.01	15.94	29.04	40.36	19.62	7.28	3.70	17.05	13.05	16.48	34.84	18.59	13.98	41.18	11.11	22.36	11.37
10	22.31	4.83	1.26	47.65	23.95	36.17	27.20	22.51	9.23	4.90	8.46	14.34	3.02	49.67	24.50	20.32	2.77	12.45	43.98	20.48
Mean	20.46	25.15	9.57	29.03	15.79	34.47	34.64	20.79	6.55	3.55	16.44	19.09	9.13	35.95	19.38	20.08	19.11	10.27	32.89	17.65
St. Dev.	6.70	14.68	13.19	10.30	4.43	4.21	5.36	5.38	1.73	1.05	7.88	7.41	9.15	9.80	3.57	9.58	15.38	6.52	13.42	7.02