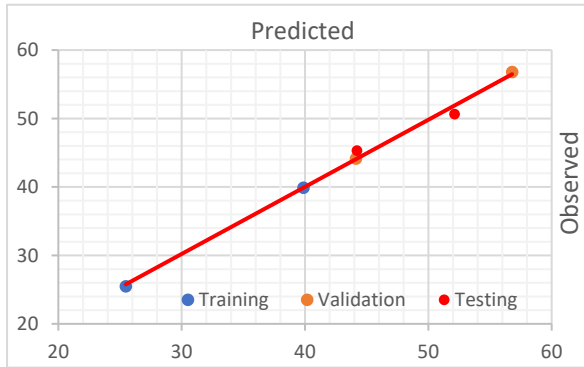
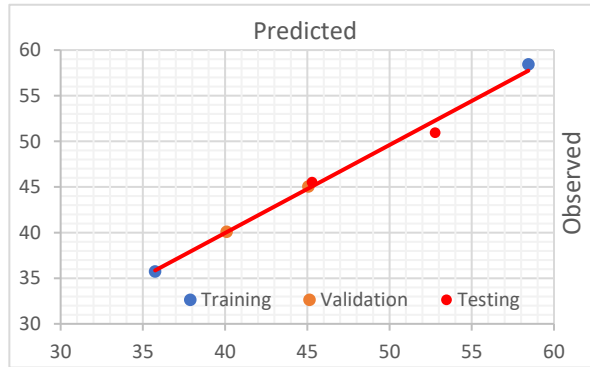


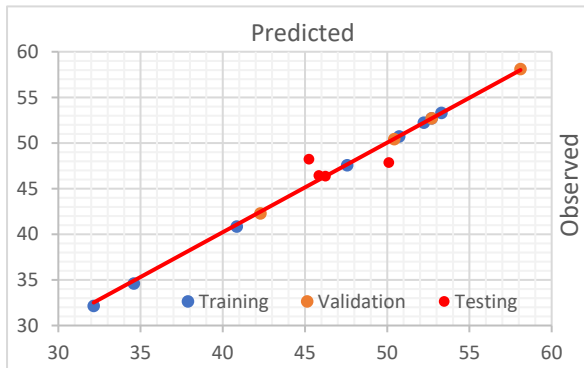
## Supplementary data



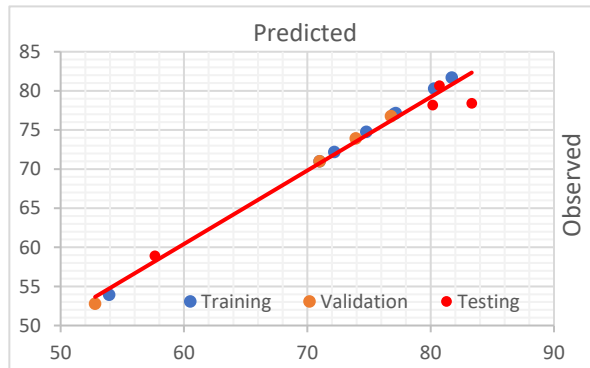
(a) Experiment 1



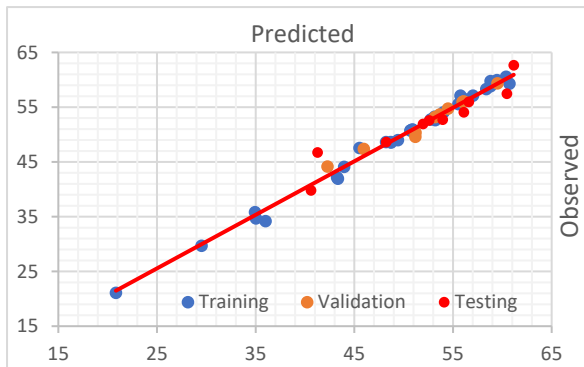
(b) Experiment 2



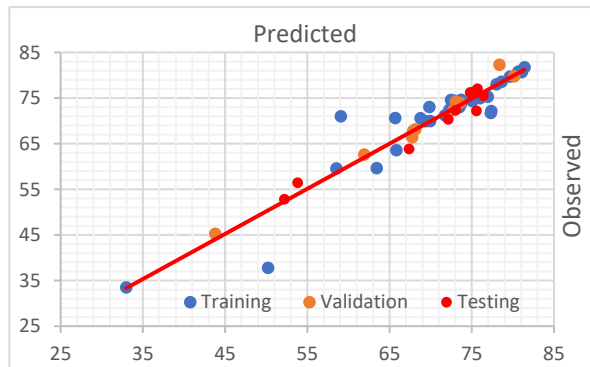
(c) Experiment 3



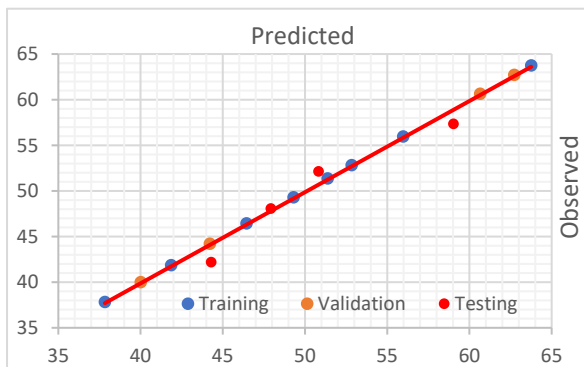
(d) Experiment 4



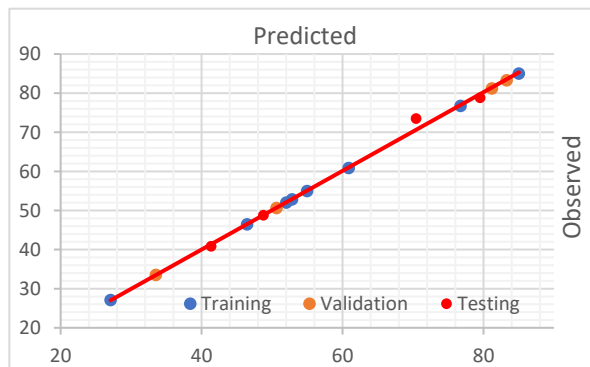
(e) Experiment 5



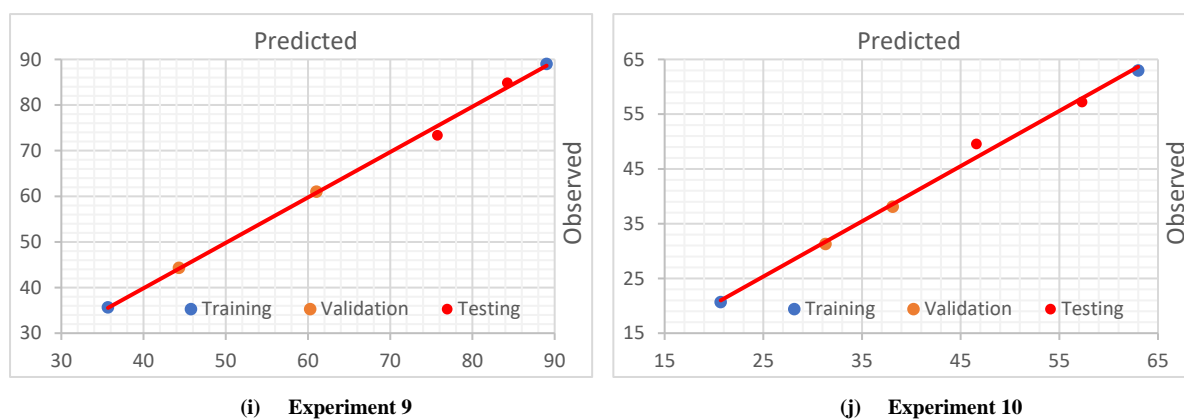
(f) Experiment 6



(g) Experiment 7



(h) Experiment 8



**Figure S1.** The scatter plots of the observed and the predicted parameters for the RBFN

**Table S1.** The modelling results in terms of RMSE.

Exp. No	Data	RSM		SVR				FFNN				RBFN			
				Linear		Radial Basis		Gaussian		Linear		Sigmoid		RBFN	
		MAPE	Rank	MAPE	Rank	MAPE	Rank	MAPE	Rank	MAPE	Rank	MAPE	Rank	MAPE	Rank
1	Train	----	----	0.5266	6	0.4381	4	0.4837	5	0.0002	2	0.0023	3	1.78E-12	1
	Val	---	---	0.0346	4	0.0368	5	0.0808	6	7.01E-08	3	1.33E-06	2	1.54E-12	1
	Test	----	----	0.0722	5	0.0947	6	0.0216	1	0.0481	3	0.0587	4	0.0268	2
	ALL	0.1296	4	0.2111	7	0.1899	5	0.1954	6	0.0161	2	0.0203	3	0.0089	1
2	Train	----	----	0.1787	4	0.2098	5	0.2120	6	5.40E-07	2	0.0014	3	2.92E-14	1
	Val	---	---	0.0638	4	0.0935	6	0.0913	5	6.12E-07	2	3.20E-05	3	4.60E-14	1
	Test	----	----	0.1587	6	0.0954	3	0.0954	3	0.0472	2	0.1045	5	0.0206	1
	ALL	0.0899	4	0.1337	7	0.1329	5	0.1329	5	0.0157	2	0.0353	3	0.0069	1
3	Train	----	----	0.1182	6	0.1041	5	0.0989	4	0.0068	3	0.0014	2	5.25E-13	1
	Val	---	---	0.0301	6	0.0233	5	0.0200	4	4.15E-05	2	0.0001	3	4.82E-13	1
	Test	----	----	0.0570	4	0.0594	5	0.0751	6	0.0441	2	0.0498	3	0.0312	1
	ALL	0.0437	4	0.0809	7	0.0727	5	0.0732	6	0.0145	3	0.0132	2	0.0078	1
4	Train	----	----	0.1161	5	0.0988	4	0.1509	6	2.45E-05	2	0.0002	3	7.32E-09	1
	Val	---	---	0.1021	5	0.1144	6	0.0247	4	1.40E-05	2	0.0001	3	1.09E-08	1
	Test	----	----	0.0791	6	0.0761	5	0.0563	2	0.0583	4	0.0344	1	0.0582	3
	ALL	0.0763	4	0.1033	7	0.0970	6	0.0957	5	0.0146	2	0.0087	1	0.0146	2
5	Train	----	----	0.1327	6	0.1134	4	0.1299	5	0.0330	2	0.0182	1	0.0347	3
	Val	---	---	0.0447	5	0.0598	6	0.0361	4	0.0149	3	0.0109	1	0.0144	2
	Test	----	----	0.0740	6	0.0709	5	0.0540	4	0.0413	3	0.0372	2	0.0257	1
	ALL	0.1158	7	0.1040	6	0.0946	4	0.0966	5	0.0311	3	0.0205	1	0.0289	2
6	Train	---	---	0.1780	6	0.1573	5	0.1538	4	0.0185	2	0.0269	3	0.0105	1
	Val	---	---	0.0434	4	0.0866	6	0.0780	5	0.0139	2	0.0176	3	0.0129	1
	Test	----	----	0.0933	5	0.0839	4	0.0963	6	0.0339	2	0.0376	3	0.0295	1
	ALL	0.0837	4	0.1350	7	0.1291	6	0.1277	5	0.0206	3	0.0272	3	0.0147	1
7	Train	----	----	0.0863	6	0.0579	4	0.0608	5	0.0003	2	0.0009	3	3.46E-11	1
	Val	---	---	0.0154	4	0.0213	6	0.0193	5	0.0003	3	0.0002	2	3.43E-11	1
	Test	----	----	0.0293	4	0.0590	6	0.0510	5	0.0188	2	0.0146	1	0.0268	3
	ALL	0.0321	4	0.0543	7	0.0490	6	0.0480	5	0.0049	2	0.0042	1	0.0067	3
8	Train	----	----	0.1275	6	0.1088	5	0.0911	4	0.0004	2	0.0022	3	1.51E-11	1
	Val	---	---	0.0315	4	0.0534	5	0.0682	6	0.0004	2	0.0010	3	2.04E-11	1
	Test	----	----	0.0833	6	0.0699	5	0.0698	4	0.0090	1	0.0170	3	0.0157	2
	ALL	0.0380	4	0.0924	7	0.0852	6	0.0801	5	0.0025	1	0.0056	3	0.0039	2
	Train	----	----	0.0739	6	0.0703	4	0.0703	4	3.77E-05	2	0.0021	3	9.96E-17	1

9	Val	---	---	0.0419	4	0.0588	5	0.0588	5	1.19E-05	2	0.0002	3	2.19E-16	1
	Test	----	----	0.0979	6	0.0198	3	0.0198	3	0.0207	5	0.0179	1	0.0196	2
	ALL	0.0440	4	0.0712	7	0.0496	5	0.0496	5	0.0069	3	0.0067	2	0.0065	1
10	Train	----	----	0.0731	4	0.1066	5	0.1066	5	2.93E-05	2	0.0038	3	1.55E-13	1
	Val	---	---	0.0668	6	0.0455	4	0.0455	4	1.42E-06	2	0.0001	3	2.92E-14	1
	Test	----	----	0.0757	6	0.0272	2	0.0272	2	0.0253	1	0.0340	4	0.0305	5
	ALL	0.0279	4	0.0719	7	0.0598	5	0.0598	5	0.0084	1	0.0126	3	0.0102	2
Average Rank	Train	---		5.50		4.50		4.80		2.10		2.70		1.20	
	Val	---		4.60		5.40		4.80		2.30		2.60		1.10	
	Test	---		5.40		4.40		3.60		2.50		2.70		2.10	
	ALL	4.30		6.90		5.30		5.20		2.20		2.20		1.60	

**Table S2.** The modelling results in terms of MAPE

Exp. No	Data	RSM		SVR						FFNN					
				Linear		Radial Basis		Gaussian		Linear		Sigmoid		RBFN	
		MAPE	Rank	MAPE	Rank	MAPE	Rank	MAPE	Rank	MAPE	Rank	MAPE	Rank	MAPE	Rank
1	Train	----	----	17.3079	6	15.0981	4	16.9022	5	0.0073	2	0.0812	3	5.47E-11	1
	Val	---	---	1.4662	4	1.5408	5	5.0416	6	4.54E-06	2	0.0001	3	8.73E-11	1
	Test	----	----	4.0693	5	5.3844	6	1.2662	1	2.8366	3	2.9473	4	1.3040	2
	ALL	6.5863	4	10.3001	7	9.2973	5	10.2096	6	1.6377	2	1.7023	3	0.7528	1
2	Train	----	----	7.6197	4	9.8364	5	9.8364	5	3.57E-05	2	0.0605	3	1.29E-12	1
	Val	---	---	2.7192	4	6.2778	5	6.2778	5	3.69E-05	2	0.0017	3	1.96E-12	1
	Test	----	----	11.1658	6	4.2060	4	4.2060	4	2.1915	2	5.1856	3	1.3015	1
	ALL	5.2863	4	7.9609	7	7.1614	5	7.1614	5	1.2652	2	2.9941	3	0.7514	1
3	Train	----	----	5.9871	6	5.4010	5	5.2255	4	0.5484	3	0.0974	2	3.84E-11	1
	Val	---	---	2.4947	6	1.1884	5	1.0755	4	0.0020	2	0.0050	3	2.50E-11	1
	Test	----	----	3.1133	4	3.3511	5	4.5394	6	2.7828	2	3.1634	3	1.8951	1
	ALL	2.3672	4	4.6799	7	4.2126	5	4.3696	6	1.4444	2	1.5832	3	0.9475	1
4	Train	----	----	9.4600	4	9.7949	5	11.9474	6	0.0020	2	0.0176	3	7.58E-07	1
	Val	---	---	7.4531	5	9.6380	6	2.2101	4	0.0013	2	0.0098	3	8.48E-07	1
	Test	----	----	6.6401	5	6.7684	6	4.8412	2	5.0740	3	3.2223	1	5.6709	4
	ALL	6.2961	4	8.3460	5	9.0910	7	8.8573	6	2.5370	2	1.6112	1	2.8355	3
	Train	----	----	11.2622	6	10.5508	4	11.2499	5	3.5637	2	1.9826	1	3.7171	3
	Val	---	---	4.3003	5	5.5169	6	4.1114	4	1.1814	2	0.9937	1	1.4611	3

5	Test	----	----	7.4786	6	6.5700	5	4.2610	4	3.7504	3	3.3765	2	2.0045	1
	ALL	6.4586	4	9.5754	7	9.0607	5	9.1544	6	3.2789	3	2.1951	1	3.0992	2
6	Train	---	---	8.9985	6	8.5269	5	8.3141	4	1.1485	2	1.5926	3	0.7468	1
	Val	---	---	3.4208	4	5.0291	6	4.7308	5	0.9647	2	1.5567	3	0.9388	1
	Test	----	----	5.5577	5	5.1181	4	6.1739	6	2.3767	2	2.4189	3	2.1896	1
	ALL	7.0605	4	7.5875	7	7.3682	6	7.3403	5	1.4463	2	1.7788	3	1.2050	1
	Train	----	----	5.4079	6	4.4035	5	4.3852	4	0.0181	2	0.0791	3	2.84E-09	1
	Val	---	---	1.0316	4	1.0566	5	1.1196	6	0.0211	3	0.0142	2	2.24E-09	1
7	Test	----	----	1.6600	4	3.7897	6	3.6444	5	1.0909	3	0.9156	2	1.4914	3
	ALL	1.8223	4	3.9469	7	3.6831	6	3.6399	5	0.5457	2	0.4613	1	0.7457	3
8	Train	----	----	7.6391	6	6.2738	5	4.9459	4	0.0362	2	0.2083	3	1.22E-09	1
	Val	---	---	2.2318	4	2.6560	5	4.1138	6	0.0444	2	0.0809	3	1.21E-09	1
	Test	----	----	4.2301	4	4.8232	6	4.7006	5	0.4920	1	0.8088	2	1.6141	3
	ALL	2.4963	4	5.9073	7	5.2211	6	4.6889	5	0.2483	1	0.4323	2	0.8071	3
9	Train	----	----	3.1969	4	3.5171	6	3.5171	6	0.0035	2	0.0849	3	5.02E-15	1
	Val			2.9945	4	3.4806	6	3.4806	6	0.0009	2	0.0179	3	1.12E-14	1
	Test	----	----	9.5050	6	1.3256	3	1.3256	3	2.3695	5	1.4321	1	1.7143	2
	ALL	2.7026	4	6.0424	7	2.9576	5	2.9576	5	1.3680	3	0.8284	1	0.9897	2
10	Train	----	----	2.2767	4	3.0513	5	3.0513	5	0.0008	2	0.1052	3	4.33E-12	1
	Val	---	---	4.3536	6	2.1137	4	2.1137	4	0.0001	2	0.0064	3	1.00E-12	1
	Test	----	----	3.9664	6	1.7879	3	1.7879	3	1.3164	1	1.9197	2	2.1088	5
	ALL	1.4247	4	3.6455	7	2.3787	5	2.3787	5	0.7600	1	1.1100	2	1.2175	3
	Train	---		5.20		4.90		4.80		2.10		2.70		1.20	
	Val	---		4.60		5.30		5.00		2.10		2.70		1.20	
	Test	---		5.10		4.80		3.90		2.50		2.30		2.30	
	ALL	4.00		6.80		5.50		5.40		2.00		2.00		2.00	