Table 7: Regression ability in terms of mean square error (MSE) and termination criterion (Ter) obtained with the proposed algorithms (Linear, Constant and Cubic) and with four different activation functions (Sig, Amp, ReLU, Shape), on a set of real world problems from the UCI data set. Best results are shown in **bold**. See the main text for more details.

Function	#A	#I	#N	Constant		Linear		Cubic		Sig		Amp		ReLU		Shape	
				MSE	Ter	MSE	Ter	MSE	Ter	MSE	Ter	MSE	Ter	MSE	Ter	MSE	Ter
Airfoil	5	1503	2	0.0168	41.6	0.0171	39.1	0.0184	39.8	0.0155	138.1	0.0212	57.0	0.0814	39.6	0.0290	26.7
			5	0.0150	44.9	0.0150	39.9	0.0136	45.0	0.0138	131.7	0.0154	65.2	0.0549	44.8	0.0287	27.9
			10	0.0137	65.9	0.0136	56.1	**0.0131**	62.4	0.0135	112.6	0.0144	53.9	0.0471	47.7	0.0294	27.2
C_Power Plant	4	956	2	0.0031	30.9	0.0030	27.5	0.0036	40.5	0.0043	77.3	0.0101	44.2	0.0158	35.5	0.0050	13.6
			5	0.0030	38.1	0.0029	34.5	0.0030	48.3	0.0042	68.3	0.0054	41.9	0.0137	33.4	0.0048	10.9
			10	0.0028	38.4	**0.0027**	38.1	0.0028	59.2	0.0042	50.4	0.0059	34.1	0.0123	34.0	0.0070	7.2
Concrete Com_Str	8	1030	2	0.0129	89.6	0.0123	96.0	0.0146	101.2	0.0131	170.0	0.0223	78.1	0.0163	40.5	0.0126	53.6
			5	0.0112	94.1	0.0104	104.3	0.0136	103.6	0.0100	174.6	0.0120	137.3	0.0115	46.0	0.0108	56.9
			10	**0.0095**	107.1	0.0098	106.9	0.0116	103.9	0.0122	159.5	0.0105	123.5	0.0097	51.4	0.0109	52.5
Concrete Slump	10	103	2	0.0291	78.7	0.0279	93.7	0.0206	88.2	0.0245	140.7	0.0236	100.4	0.0072	93.8	0.0152	88.5
			5	0.0180	95.9	0.0158	99.6	0.0106	94.1	0.0106	178.8	0.0284	107.2	**0.0068**	83.7	0.0103	87.9
			10	0.0145	76.3	0.0132	81.5	0.0095	92.9	0.0110	162.7	0.0128	114.1	0.0097	93.3	0.0097	89.1
Energy EfficientA	8	768	2	**0.0053**	78.6	0.0053	67.5	0.0058	67.5	0.0094	136.3	0.0198	51.8	0.0095	58.1	0.0094	36.9
			5	0.0057	70.1	0.0054	73.6	0.0058	74.0	0.0066	121.1	0.0105	59.6	0.0068	38.4	0.0063	38.9
			10	0.0054	88.1	0.0056	71.6	0.0058	89.6	0.0064	105.8	0.0107	41.2	0.0058	47.4	0.0072	34.1
Energy EfficientB	8	768	2	0.0081	61.6	0.0081	54.9	0.0083	54.2	0.0097	132.3	0.0190	58.0	0.0100	65.3	0.0103	36.9
			5	0.0080	61.3	0.0082	49.2	0.0081	59.9	0.0083	95.2	0.0101	59.0	0.0081	36.8	0.0080	36.9
			10	**0.0073**	80.1	0.0079	63.2	0.0081	72.6	0.0083	84.2	0.0098	41.1	0.0077	44.5	0.0089	34.1
Forest Fire	12	517	2	**0.0027**	42.8	0.0028	38.5	0.0030	52.9	0.0044	145.4	0.0044	32.7	0.0035	108.3	0.0034	102.2
			5	0.0030	72.2	0.0030	67.2	0.0032	87.1	0.0045	138.4	0.0044	55.7	0.0036	85.3	0.0034	68.6
			10	0.0033	98.9	0.0037	93.2	0.0036	110.3	0.0045	109.1	0.0044	64.3	0.0042	81.7	0.0034	55.3
Housing	13	506	2	0.0119	123.8	0.0114	118.4	0.0115	115.1	0.0139	171.2	0.0222	74.0	0.0133	81.4	0.0141	52.7
			5	0.0116	105.9	0.0111	104.4	0.0107	117.7	0.0110	160.4	0.0163	69.8	0.0116	57.9	0.0139	46.8
			10	0.0116	89.2	0.0116	80.5	**0.0110**	125.3	0.0107	150.8	0.0147	69.2	0.0109	67.5	0.0161	35.3
Parkinson Telemonit	21	5875	2	0.0035	83.3	0.0033	86.4	0.0046	88.0	0.0048	151.5	0.0077	76.3	0.0048	91.2	0.0038	41.5
			5	0.0033	91.3	0.0032	92.6	0.0048	95.3	0.0046	128.2	0.0050	83.5	0.0044	67.3	0.0037	37.6
			10	0.0032	95.4	**0.0031**	84.3	0.0041	98.1	0.0046	106.2	0.0053	68.5	0.0040	70.7	0.0038	30.2
Wine Quality Red	11	1599	2	0.0184	65.7	0.0182	64.6	0.0182	65.9	0.0184	120.5	0.0210	53.6	0.0215	50.9	0.0191	33.0
			5	0.0184	45.3	0.0178	55.4	0.0179	75.7	0.0182	74.3	0.0193	45.8	0.0213	31.2	0.0187	27.8
			10	0.0177	49.9	0.0176	50.5	**0.0172**	115.6	0.0182	48.0	0.0195	32.1	0.0211	29.7	0.0189	25.3
Wine Quality White	11	4898	2	0.0172	34.2	0.0171	37.4	0.0173	29.7	0.0170	81.0	0.0178	56.0	0.0182	40.3	0.0173	21.3
			5	0.0167	26.6	0.0165	30.1	0.0171	33.1	0.0168	67.3	0.0172	43.9	0.0180	29.4	0.0170	17.3
			10	0.0160	34.1	**0.0158**	36.5	0.0169	36.0	0.0167	53.4	0.0171	36.0	0.0176	34.2	0.0172	14.7
Yacht Hydrody.	6	308	2	0.0077	93.4	0.0071	87.1	0.0158	97.2	0.0137	189.7	0.0233	94.3	0.0147	103.0	0.0201	55.4
			5	0.0033	111.2	**0.0017**	112.2	0.0016	126.3	0.0079	189.4	0.0131	77.7	0.0081	76.7	0.0207	46.0
			10	0.0059	106.3	0.0038	106.2	0.0026	98.5	0.0065	180.1	0.0122	66.7	0.0072	85.8	0.0186	51.0

Table 5: Generalization ability in terms of accuracy (Acc) and termination criterion (Ter) obtained with the proposed algorithms (Linear, Constant and Cubic) and with four different activation functions (Sig, Amp, ReLU, Shape), on a set of real world problems from the UCI data set. Best results are shown in **bold**. See the main text for more details.

Function	#A	#I	#N	Constant		Linear		Cubic		Sig		Amp		ReLU		Shape	
				Acc	Ter	Acc	Ter	Acc	Ter	Acc	Ter	Acc	Ter	Acc	Ter	Acc	Ter
Blood Transfusion	5	748	2	79.03	43.9	79.16	29.0	80.25	36.8	78.51	113.5	76.35	28.9	76.76	102.5	75.54	24.3
			5	79.70	25.1	80.84	35.1	79.54	40.2	77.84	70.2	78.11	37.5	76.62	44.3	76.43	23.2
			10	**81.84**	27.7	78.86	27.9	78.12	41.6	78.92	50.1	78.24	31.1	76.49	36.0	77.03	20.7
Cancer	9	286	2	97.32	37.2	97.60	38.3	**97.79**	35.1	88.34	131.1	89.38	43.0	95.97	52.6	96.53	22.6
			5	97.32	43.0	97.34	45.1	97.76	40.6	95.85	89.6	95.69	40.6	96.03	33.0	96.52	25.7
			10	97.44	43.7	97.53	42.0	97.33	53.1	95.56	62.6	95.75	35.2	95.79	32.4	96.93	23.6
Card	51	690	2	85.99	44.1	86.16	46.9	86.71	37.6	81.35	47.5	78.97	31.0	86.09	56.2	84.52	23.4
			5	85.90	45.7	86.12	49.8	86.69	35.6	84.39	35.6	83.71	33.5	85.15	47.7	82.54	15.9
			10	86.96	58.6	**86.90**	55.7	86.14	47.9	84.10	33.6	84.25	26.6	80.29	38.4	78.46	21.7
Climate	18	540	2	92.30	34.4	92.56	40.9	92.76	48.0	91.04	95.1	90.48	15.7	90.52	92.0	92.17	30.6
			5	92.59	39.8	92.65	46.5	93.01	49.9	91.70	83.1	90.46	14.7	90.13	70.7	92.48	27.1
			10	93.00	57.5	93.00	59.6	**93.11**	47.5	91.65	76.8	90.46	12.2	90.65	56.5	92.37	21.7
Diabetes	8	768	2	75.50	35.9	75.90	37.0	76.85	35.5	71.49	107.4	74.87	62.4	71.43	46.0	68.84	17.5
			5	76.59	31.6	76.96	39.9	76.54	36.8	75.78	69.7	75.34	53.3	70.99	27.0	69.41	14.3
			10	**77.09**	37.4	77.01	34.6	76.24	37.9	75.25	54.3	75.09	41.0	71.66	30.3	68.16	12.8
Fertility	10	100	2	88.20	20.2	88.50	24.6	88.44	23.2	86.70	56.0	86.90	21.7	87.80	82.1	88.00	42.0
			5	87.10	27.8	87.00	24.6	**88.52**	23.1	85.90	49.0	87.00	26.9	87.00	45.6	88.00	35.9
			10	86.20	25.1	85.30	24.6	88.32	25.8	85.90	33.1	86.90	27.4	87.50	37.9	87.80	25.5
heartc	35	303	2	80.53	48.2	79.13	43.7	81.22	43.2	76.87	69.2	73.60	27.3	**82.10**	69.5	80.27	23.5
			5	80.83	51.8	80.60	50.2	81.62	45.2	79.57	47.7	79.33	30.6	81.13	53.3	78.20	14.0
			10	81.20	40.7	81.67	49.0	80.98	53.1	79.70	37.8	77.80	17.6	78.70	42.1	74.33	5.9
Ionosphere	34	351	2	81.77	50.1	82.69	53.1	83.65	62.4	74.43	111.4	73.31	42.8	76.06	96.8	72.60	20.5
			5	87.46	66.7	87.57	64.1	85.38	60.9	87.51	89.2	84.71	77.0	74.51	80.6	77.66	13.2
			10	88.83	58.9	87.57	58.5	**89.78**	65.1	89.23	78.0	89.66	78.4	64.14	52.2	75.97	9.1
Sonar	60	208	2	61.75	43.8	64.65	50.1	65.03	57.8	58.90	85.8	58.30	31.6	68.35	88.7	62.05	22.6
			5	70.85	68.4	73.35	59.3	69.74	58.9	72.85	77.1	68.40	46.7	68.15	70.9	66.85	17.1
			10	75.50	47.6	73.95	51.8	72.26	59.7	**75.55**	77.8	72.90	50.5	66.40	55.1	66.45	14.8
Statlog (Heart)	35	270	2	81.52	40.2	81.11	39.2	81.16	40.8	78.60	75.5	75.07	48.5	82.48	72.2	**82.66**	25.8
			5	82.00	39.8	80.85	38.1	81.71	42.2	80.78	58.0	79.93	44.2	81.26	42.3	80.37	18.7
			10	81.70	36.1	81.96	44.2	81.96	42.1	80.04	37.8	80.11	32.0	80.00	33.5	77.44	14.5
Vertebral Column	6	310	2	79.42	37.4	79.16	29.0	80.61	37.4	83.87	165.8	69.68	29.3	75.16	62.4	78.39	33.8
			5	79.70	25.1	81.03	40.8	**86.76**	42.3	85.77	133.2	75.78	44.4	78.06	44.2	82.90	29.2
			10	81.84	27.7	84.55	45.2	81.33	43.8	85.16	151.1	77.74	30.0	80.01	54.4	72.58	25.1