APPENDIX

Additional Result for Classification Problems

A.1 Experimental result of the small data sets

This additional result is the full experimental result of section 4.2.3 in which the small data sets are considered. Since the number of data sets is 24 and the experimental results are compared to that of 42 other methods, we split the table of the experiment result into 3 tables. Table A.1.1 shows the names and labels of all data sets. Tables A.1.2 and A.1.3 represent the accuracy and reduction results, respectively.

Table A.1.1 Label and name of small data sets.

Label of data sets	Name of data sets
1	appendicitis
2	bupa
3	cleveland
4	contraceptive
5	dermatology
6	ecoli
7	glass
8	haberman
9	hayes-roth
10	heart
11	iris
12	led7digit
13	monks
14	newthyroid
15	pima
16	sonar
17	spectfheart
18	tae
19	vehicle
20	vowel
21	wine
22	wisconsin
23	yeast
24	zoo

Table A.1.2 Accuracy results of small data sets.

Methods	Data sets							
	1	2	3	4	5	6	7	8
Proposed	0.7625	0.6272	0.4803	0.4739	0.8246	0.7818	0.6920	0.7000
AllKNN	0.8782	0.5937	0.5582	0.4555	0.9673	0.8304	0.6787	0.6991
CCIS	0.8400	0.5864	0.4488	0.4155	0.9372	0.6610	0.5764	0.7319
CHC	0.8427	0.6057	0.5941	0.5112	0.9593	0.8036	0.7043	0.7448
CNN	0.7855	0.6003	0.4884	0.4080	0.9320	0.7563	0.7126	0.6403
CoCoIS	0.8482	0.5688	0.5417	0.4583	0.9565	0.7563	0.6332	0.7286
CPruner	0.8018	0.5100	0.5412	0.4182	0.9402	0.5955	0.4716	0.7353
DROP3	0.6536	0.5986	0.4947	0.4406	0.9293	0.7263	0.6571	0.6697
ENN	0.8973	0.5858	0.5643	0.4528	0.9591	0.8248	0.6919	0.6990
ENNTh	0.8691	0.6314	0.5612	0.4827	0.9673	0.7857	0.6889	0.7382
ENRBF	0.8018	0.5789	0.5644	0.4481	0.9618	0.4256	0.3956	0.7353
Explore	0.8591	0.5814	0.5708	0.4834	0.9484	0.7741	0.6625	0.7352
FCNN	0.7745	0.6123	0.5085	0.4155	0.9265	0.7472	0.7123	0.6272
GCNN	0.7845	0.6022	0.4686	0.3863	0.9508	0.7208	0.7042	0.4444
GGA	0.8418	0.6517	0.5446	0.4658	0.9510	0.7954	0.6656	0.7087
HMNEI	0.8500	0.6001	0.5480	0.4542	0.9454	0.8188	0.7147	0.6696
IB3	0.7300	0.6021	0.5052	0.4264	0.9208	0.7417	0.6605	0.6211
ICF	0.5464	0.5329	0.5019	0.4480	0.8852	0.7676	0.6021	0.6732
IGA	0.6000	0.6068	0.4822	0.4725	0.9179	0.7029	0.5840	0.6760
IKNN	0.7273	0.6108	0.4687	0.4277	0.8852	0.6313	0.6420	0.6632
MCNN	0.7082	0.5734	0.4945	0.4155	0.9236	0.7170	0.6072	0.5852
MCS	0.7482	0.6169	0.4982	0.4277	0.9346	0.7269	0.6990	0.6697
MENN	0.8691	0.6314	0.5546	0.4773	0.9673	0.7917	0.6889	0.7382
MNV	0.7482	0.6003	0.5217	0.4209	0.9264	0.7387	0.7306	0.6372
ModelCS	0.8327	0.6198	0.5480	0.4488	0.9646	0.8307	0.7007	0.6567
MSS	0.8018	0.5965	0.5282	0.4196	0.9372	0.7800	0.7206	0.6405
Multiedit	0.8691	0.6001	0.5478	0.4433	0.9646	0.7593	0.6372	0.7187
NCNEdit	0.8609	0.6052	0.5776	0.4664	0.9673	0.8365	0.6882	0.7123
NRMCS	0.8118	0.5839	0.5412	0.4501	0.8606	0.7234	0.6250	0.7448
POP	0.7936	0.6108	0.5314	0.4026	0.9535	0.8040	0.7361	0.6601
PSC	0.6891	0.5858	0.4419	0.3870	0.9236	0.6099	0.6599	0.6013
PSRCG	0.7836	0.5907	0.5048	0.4074	0.8804	0.7209	0.6674	0.6273
Reconsistent	0.7291	0.5709	0.5147	0.4127	0.9316	0.6906	0.6818	0.5877
RMHC	0.8318	0.6144	0.5714	0.4535	0.9456	0.7978	0.6185	0.7087
RNG	0.8791	0.5930	0.5646	0.4766	0.9674	0.8307	0.6924	0.7184
RNN	0.8209	0.6021	0.5249	0.4454	0.9430	0.7679	0.6435	0.7286
Shrink	0.7445	0.4305	0.3700	0.4257	0.4369	0.2293	0.3731	0.5786
SNN	0.5582	0.5713	0.4092	0.3706	0.8608	0.5586	0.5891	0.3074
SSMA	0.8518	0.6217	0.5612	0.4773	0.9402	0.8099	0.7013	0.6896
SVBPS	0.6882	0.5470	0.4983	0.3958	0.9319	0.7086	0.6557	0.5488
TCNN	0.7573	0.6169	0.5084	0.4074	0.9125	0.7683	0.7095	0.6430
TRKNN	0.6345	0.5770	0.4916	0.3836	0.9399	0.6939	0.6315	0.6045
VSM	0.5445	0.5602	0.4588	0.4107	0.8794	0.5804	0.6823	0.5091

Table A.1.2 Accuracy results of small data sets (cont.).

Methods	Data Set							
	9	10	11	12	13	14	15	16
Proposed	0.5567	0.6704	0.9533	0.5991	0.9416	0.9031	0.6819	0.8203
AllKNN	0.4515	0.7963	0.9533	0.4340	0.7692	0.9494	0.7266	0.8164
CCIS	0.3362	0.7333	0.9467	0.3920	0.7906	0.9303	0.7059	0.6874
CHC	0.4564	0.8259	0.9400	0.6400	0.9496	0.9489	0.7461	0.7498
CNN	0.2911	0.7481	0.9200	0.3440	0.8659	0.9582	0.6628	0.8460
CoCoIS	0.3245	0.8074	0.9533	0.4140	0.7890	0.9400	0.7423	0.7483
CPruner	0.3935	0.7815	0.7733	0.2160	0.6543	0.9026	0.6485	0.6743
DROP3	0.3822	0.6926	0.9267	0.4060	0.6571	0.9491	0.6901	0.7779
ENN	0.4746	0.7852	0.9533	0.4920	0.7817	0.9494	0.7449	0.8212
ENNTh	0.4065	0.8074	0.9400	0.3860	0.6579	0.9444	0.7137	0.8167
ENRBF	0.2629	0.8148	0.9400	0.4580	0.7619	0.6981	0.6511	0.7407
Explore	0.5674	0.7963	0.9400	0.6300	0.9542	0.9255	0.7488	0.7460
FCNN	0.4358	0.7519	0.9000	0.3620	0.9909	0.9489	0.6499	0.8264
GCNN	0.4916	0.6963	0.9267	0.3660	0.7135	0.9584	0.6746	0.8412
GGA	0.4471	0.7889	0.9667	0.6420	0.9168	0.9632	0.7268	0.7829
HMNEI	0.3587	0.7889	0.9533	0.3740	0.6773	0.9537	0.7372	0.8262
IB3	0.3581	0.7370	0.8733	0.4040	0.8203	0.9446	0.6419	0.8264
ICF	0.3987	0.6519	0.8933	0.3720	0.6946	0.7626	0.6732	0.6633
IGA	0.3867	0.7481	0.9067	0.5100	0.7874	0.9400	0.7060	0.6202
IKNN	0.3499	0.7593	0.9000	0.3780	0.7791	0.9677	0.7033	0.8555
MCNN	0.5932	0.7407	0.9267	0.4060	0.8519	0.9158	0.6708	0.7398
MCS	0.3570	0.7704	0.9133	0.4020	0.8567	0.9537	0.6252	0.8364
MENN	0.4658	0.8074	0.9400	0.1760	0.6390	0.9444	0.7137	0.7831
MNV	0.3065	0.7444	0.9067	0.3740	0.8710	0.9537	0.6446	0.8417
ModelCS	0.3719	0.7815	0.9333	0.4760	0.7745	0.9677	0.7319	0.8550
MSS	0.3570	0.7704	0.9467	0.4020	0.7445	0.9723	0.6797	0.8552
Multiedit	0.3867	0.7778	0.9333	0.3180	0.7715	0.9307	0.7216	0.7498
NCNEdit	0.3142	0.7963	0.9467	0.4360	0.8117	0.9634	0.7539	0.8360
NRMCS	0.2441	0.7593	0.9333	0.0700	0.7551	0.8091	0.7138	0.7252
POP	0.3570	0.7704	0.9333	0.4020	0.7808	0.9630	0.7020	0.8555
PSC	0.3043	0.7074	0.8933	0.3500	0.8519	0.9487	0.6067	0.7876
PSRCG	0.3493	0.7370	0.6067	0.4000	0.7320	0.9444	0.6421	0.7879
Reconsistent	0.3147	0.7000	0.9200	0.2380	0.7362	0.9206	0.6565	0.8360
RMHC	0.5118	0.7852	0.9533	0.6300	0.9012	0.9535	0.7370	0.7636
RNG	0.2711	0.7926	0.9533	0.4780	0.7837	0.9632	0.7462	0.8502
RNN	0.3711	0.8185	0.9533	0.4100	0.7811	0.9437	0.7176	0.8067
Shrink	0.3704	0.5148	0.6067	0.3340	0.5243	0.2232	0.4404	0.5005
SNN	0.4914	0.5815	0.9133	0.3620	0.5096	0.8693	0.5482	0.7352
SSMA	0.6233	0.7963	0.9400	0.3600	0.9681	0.9587	0.7254	0.7833
SVBPS	0.4349	0.7111	0.7400	0.4100	0.6801	0.6595	0.5899	0.7779
TCNN	0.4915	0.7481	0.9133	0.3380	0.8429	0.9442	0.6682	0.8560
TRKNN	0.3422	0.7259	0.8933	0.3900	0.8690	0.9071	0.6433	0.7786
VSM	0.3642	0.6222	0.8200	0.3680	0.7309	0.8652	0.5926	0.7729

Table A.1.2 Accuracy results of small data sets (cont.).

Methods	Data Set							
	17	18	19	20	21	22	23	24
Proposed	0.7019	0.3553	0.6240	0.9566	0.7182	0.9311	0.5131	0.8494
AllKNN	0.7457	0.4642	0.6832	0.9576	0.9552	0.9642	0.5479	0.9114
CCIS	0.6756	0.4504	0.6075	0.4323	0.7147	0.6552	0.4245	0.9281
CHC	0.7899	0.5504	0.6195	0.7111	0.9719	0.9614	0.5654	0.9056
CNN	0.6705	0.3650	0.6808	0.9596	0.9261	0.9385	0.4690	0.8567
CoCoIS	0.7452	0.4567	0.6583	0.7798	0.9379	0.9613	0.5465	0.8631
CPruner	0.7942	0.3913	0.4515	0.4495	0.9150	0.9571	0.4730	0.7753
DROP3	0.6973	0.5113	0.6099	0.9293	0.9105	0.8913	0.5331	0.9264
ENN	0.7419	0.4842	0.6927	0.9646	0.9552	0.9642	0.5505	0.9114
ENNTh	0.7719	0.4967	0.6419	0.8768	0.9549	0.9657	0.5830	0.9047
ENRBF	0.7942	0.4700	0.5746	0.3828	0.9663	0.9414	0.3127	0.9281
Explore	0.7942	0.4767	0.6017	0.5838	0.9438	0.9657	0.5762	0.8464
FCNN	0.6332	0.3517	0.6489	0.9707	0.9033	0.9371	0.4643	0.7706
GCNN	0.6970	0.3325	0.6702	0.5010	0.9552	0.9528	0.4535	0.9089
GGA	0.7905	0.5504	0.6655	0.7808	0.9379	0.9599	0.5485	0.9183
HMNEI	0.7231	0.4842	0.6844	0.9111	0.9552	0.9699	0.5472	0.9197
IB3	0.6712	0.3058	0.6619	0.9455	0.9275	0.9428	0.4670	0.9147
ICF	0.4792	0.4779	0.6336	0.9253	0.9493	0.8170	0.5088	0.9322
IGA	0.7568	0.3833	0.6336	0.8909	0.9268	0.9528	0.5519	0.7522
IKNN	0.6856	0.4117	0.7021	0.9929	0.9382	0.9542	0.4333	0.7261
MCNN	0.6815	0.4383	0.6194	0.9505	0.9154	0.9471	0.4394	0.7428
MCS	0.6558	0.4050	0.6536	0.9535	0.9039	0.9256	0.4583	0.7839
MENN	0.7719	0.4892	0.6407	0.8616	0.9549	0.9657	0.5830	0.9064
MNV	0.6185	0.3117	0.6701	0.9646	0.8984	0.9370	0.4724	0.8272
ModelCS	0.7271	0.4842	0.6785	0.9929	0.9552	0.9657	0.5243	0.9281
MSS	0.6858	0.3521	0.6868	0.9879	0.9605	0.9485	0.4785	0.8467
Multiedit	0.7454	0.4379	0.6383	0.6687	0.9552	0.9628	0.5620	0.9064
NCNEdit	0.7385	0.4371	0.6821	0.9788	0.9552	0.9657	0.5586	0.9281
NRMCS	0.7682	0.4912	0.5993	0.6051	0.8931	0.9513	0.5640	0.7147
POP	0.6970	0.4050	0.7010	0.9939	0.9552	0.9557	0.5047	0.9281
PSC	0.6373	0.2525	0.6418	0.8253	0.8977	0.8569	0.4408	0.8919
PSRCG	0.6595	0.3788	0.6360	0.9273	0.8876	0.9214	0.4690	0.8389
Reconsistent	0.6407	0.3192	0.6666	0.9576	0.9438	0.9099	0.4616	0.9281
RMHC	0.7491	0.5242	0.6642	0.7101	0.9438	0.9671	0.5566	0.9172
RNG	0.7493	0.4912	0.6927	0.9626	0.9608	0.9657	0.5721	0.9097
RNN	0.8056	0.3508	0.5982	0.9444	0.9324	0.9599	0.5149	0.9083
Shrink	0.7942	0.3442	0.2589	0.3949	0.4886	0.6538	0.3895	0.7917
SNN	0.5587	0.2792	0.5390	0.9010	0.9160	0.6796	0.4064	0.8253
SSMA	0.7870	0.5317	0.6430	0.8495	0.9552	0.9642	0.5654	0.9350
SVBPS	0.6187	0.4254	0.5531	0.9192	0.9042	0.8928	0.4178	0.8514
TCNN	0.6632	0.2925	0.6571	0.9596	0.9154	0.9314	0.4609	0.8719
TRKNN	0.6333	0.2921	0.6985	0.9798	0.9435	0.8828	0.4549	0.9281
VSM	0.5922	0.3717	0.6347	0.9859	0.8699	0.8369	0.4421	0.9197

Table A.1.3 Reduction ratio of small data sets.

Methods	Data Set							
	1	2	3	4	5	6	7	8
Proposed	0.8952	0.8325	0.8687	0.7775	0.8411	0.8456	0.8189	0.8744
AllKNN	0.2494	0.5620	0.5368	0.7185	0.0641	0.2761	0.4215	0.4873
CCIS	0.9707	0.8982	0.6564	0.7693	0.9572	0.8624	0.8541	0.9564
CHC	0.9696	0.9726	0.9835	0.9927	0.9748	0.9616	0.9491	0.9840
CNN	0.6383	0.4180	0.3884	0.2686	0.8670	0.5966	0.5110	0.4717
CoCoIS	0.8574	0.8525	0.8841	0.9160	0.8124	0.8307	0.7835	0.9270
CPruner	0.9004	0.9916	0.9388	0.9892	0.8819	0.9183	0.9242	0.9354
DROP3	0.8774	0.7005	0.8317	0.7307	0.9232	0.8423	0.7415	0.8003
ENN	0.1593	0.3775	0.4448	0.5498	0.0310	0.1958	0.3214	0.3032
ENNTh	0.3459	0.7823	0.6604	0.8759	0.1020	0.3872	0.5587	0.5922
ENRBF	0.1981	0.4203	0.4404	0.5500	0.0404	0.5744	0.6774	0.2647
Explore	0.9790	0.9890	0.9850	0.9858	0.9730	0.9613	0.9627	0.9931
FCNN	0.6876	0.4487	0.4005	0.2873	0.8813	0.6359	0.5386	0.4877
GCNN	0.5472	0.2396	0.3653	0.4002	0.5808	0.6151	0.4315	0.6369
GGA	0.9654	0.9298	0.9641	0.9199	0.9587	0.9402	0.9195	0.9666
HMNEI	0.4949	0.5604	0.6065	0.5424	0.5075	0.4199	0.3462	0.5854
IB3	0.7263	0.5855	0.4833	0.4415	0.8862	0.6931	0.5941	0.6315
ICF	0.8512	0.7046	0.7972	0.6881	0.7034	0.7460	0.6775	0.6543
IGA	0.9465	0.9205	0.9215	0.8476	0.9268	0.9120	0.9044	0.9256
IKNN	0.6195	0.0000	0.3506	0.0000	0.8464	0.7163	0.6465	0.1394
MCNN	0.8196	0.9501	0.8170	0.9786	0.9077	0.8515	0.7722	0.9448
MCS	0.7264	0.5160	0.4265	0.0000	0.9120	0.6693	0.5878	0.0000
MENN	0.3459	0.7823	0.6854	0.8853	0.1026	0.3919	0.5711	0.6020
MNV	0.7076	0.4422	0.4162	0.2997	0.8701	0.6240	0.5681	0.4996
ModelCS	0.1038	0.1952	0.2809	0.3134	0.0200	0.1151	0.1537	0.1895
MSS	0.4958	0.2055	0.3099	0.1621	0.7450	0.4726	0.3905	0.3678
Multiedit	0.2254	0.5008	0.5424	0.7009	0.0577	0.2804	0.4560	0.3860
NCNEdit	0.1834	0.3591	0.4334	0.5539	0.0322	0.1898	0.2861	0.3304
NRMCS	0.9885	0.9346	0.9806	0.9738	0.9848	0.9795	0.9496	0.9837
POP	0.1834	0.0022	0.0018	0.6878	0.0003	0.0559	0.0000	0.1343
PSC	0.7506	0.5642	0.5680	0.4775	0.9074	0.7126	0.5763	0.6173
PSRCG	0.6216	0.2592	0.2912	0.1755	0.8528	0.5675	0.3853	0.3900
Reconsistent	0.6353	0.3907	0.3682	0.2654	0.7441	0.6200	0.5062	0.4731
RMHC	0.9057	0.9002	0.9010	0.9004	0.9016	0.9008	0.9013	0.9020
RNG	0.1624	0.3855	0.4224	0.5019	0.0607	0.2133	0.3349	0.3580
RNN	0.9874	0.9337	0.9230	0.9546	0.9278	0.8528	0.8183	0.9412
Shrink	0.7432	0.5346	0.4547	0.3520	0.9281	0.6934	0.6086	0.5693
SNN	0.7799	0.5465	0.4536	0.5454	0.9375	0.7258	0.6236	0.7400
SSMA	0.9633	0.9452	0.9795	0.9702	0.9678	0.9458	0.9335	0.9811
SVBPS	0.7893	0.5578	0.4005	0.3653	0.8540	0.6541	0.5805	0.6086
TCNN	0.6625	0.4167	0.3880	0.2840	0.8491	0.6082	0.5312	0.5112
TRKNN	0.7264	0.4457	0.4301	0.3890	0.6154	0.5926	0.4927	0.5762
VSM	0.7590	0.4119	0.3539	0.1804	0.8649	0.6029	0.3863	0.5414

Table A.1.3 Reduction ratio of small data sets (cont.).

Methods	Data Set							
	9	10	11	12	13	14	15	16
Proposed	0.7904	0.8440	0.9407	0.8849	0.7924	0.9132	0.8653	0.8296
AllKNN	0.8241	0.3420	0.0519	0.7093	0.3683	0.0677	0.3922	0.2110
CCIS	0.8055	0.9556	0.9667	0.8469	0.9661	0.9814	0.9499	0.9615
CHC	0.9537	0.9815	0.9667	0.9664	0.9913	0.9757	0.9873	0.9583
CNN	0.2189	0.5770	0.8511	0.2344	0.6998	0.8718	0.5000	0.6870
CoCoIS	0.7492	0.8918	0.7756	0.7780	0.9012	0.8579	0.9196	0.8435
CPruner	1.0000	0.9296	0.8985	0.9858	0.8642	0.8569	0.9512	0.8184
DROP3	0.7684	0.8259	0.9230	0.8278	0.8670	0.8853	0.8213	0.7591
ENN	0.7601	0.2206	0.0474	0.5660	0.0411	0.0579	0.2617	0.1699
ENNTh	0.8897	0.4531	0.0911	0.8729	0.5198	0.1142	0.5632	0.2933
ENRBF	0.6340	0.1728	0.1267	0.2609	0.2059	0.3023	0.3490	0.2078
Explore	0.9680	0.9835	0.9756	0.9624	0.9738	0.9814	0.9891	0.9706
FCNN	0.5101	0.6424	0.8711	0.6382	0.9578	0.8884	0.5311	0.7003
GCNN	0.5808	0.5251	0.7844	0.2038	0.1695	0.7902	0.3594	0.1464
GGA	0.9217	0.9560	0.9556	0.9500	0.9354	0.9690	0.9429	0.8921
HMNEI	0.7429	0.5058	0.5956	0.7696	0.5880	0.5204	0.5273	0.5523
IB3	0.5860	0.7551	0.9000	0.6276	0.7657	0.8806	0.6881	0.7259
ICF	0.6969	0.8037	0.6422	0.6178	0.6880	0.8527	0.7729	0.7121
IGA	0.9100	0.9226	0.9089	0.9313	0.9082	0.9261	0.9329	0.9092
IKNN	0.1364	0.2276	0.7119	0.1273	0.0833	0.7990	0.0829	0.1528
MCNN	0.8089	0.9412	0.8881	0.9329	0.9480	0.9432	0.9784	0.8953
MCS	0.0000	0.6572	0.8815	0.0000	0.6638	0.9096	0.5868	0.7671
MENN	0.9184	0.4663	0.0911	0.9953	0.7127	0.1142	0.5632	0.3141
MNV	0.1954	0.6300	0.8800	0.2900	0.7487	0.8972	0.5418	0.7169
ModelCS	0.1675	0.1305	0.0237	0.0353	0.1780	0.0145	0.1633	0.0529
MSS	0.3586	0.4626	0.7844	0.1629	0.3274	0.7829	0.3385	0.5053
Multiedit	0.8166	0.2798	0.0511	0.7996	0.3009	0.0998	0.3708	0.2746
NCNEdit	0.2147	0.2148	0.0393	0.3569	0.1852	0.0403	0.2953	0.1218
NRMCS	0.8872	0.9848	0.9778	0.9984	0.9547	0.9897	0.9750	0.9525
POP	0.0067	0.0000	0.2667	0.1896	0.2989	0.2274	0.0198	0.0000
PSC	0.6220	0.7206	0.8704	0.7649	0.4736	0.8780	0.6635	0.6976
PSRCG	0.2273	0.5173	0.8948	0.2698	0.4504	0.8413	0.4362	0.6330
Reconsistent	0.4907	0.5646	0.8504	0.3236	0.4719	0.8667	0.4978	0.6378
RMHC	0.9066	0.9012	0.9037	0.9000	0.9020	0.9018	0.9002	0.9038
RNG	0.4014	0.2119	0.0489	0.2742	0.0062	0.0512	0.2820	0.1886
RNN	0.9504	0.9794	0.9193	0.9804	0.9328	0.9054	0.9573	0.8018
Shrink	0.2938	0.6852	0.9304	0.3347	0.6119	0.9204	0.6262	0.8082
SNN	0.8704	0.6984	0.9289	0.9429	0.7498	0.9488	0.6487	0.7516
SSMA	0.9133	0.9716	0.9570	0.9696	0.9817	0.9711	0.9719	0.9161
SVBPS	0.5538	0.6728	0.9289	0.5649	0.8717	0.9437	0.6469	0.7003
TCNN	0.7290	0.5918	0.8748	0.9389	0.6973	0.8879	0.4976	0.6843
TRKNN	0.1743	0.6222	0.7496	0.1262	0.3444	0.8657	0.5573	0.4503
VSM	0.0850	0.6819	0.8511	0.2451	0.7138	0.8806	0.5819	0.5384

Table A.1.3 Reduction ratio of small data sets (cont.).

Methods	Data Set							
	17	18	19	20	21	22	23	24
Proposed	0.8464	0.7474	0.8261	0.7950	0.8608	0.9732	0.8271	0.7878
AllKNN	0.4228	0.6961	0.4065	0.0388	0.0512	0.0642	0.6195	0.0881
CCIS	0.9879	0.7873	0.8245	0.9420	0.9831	1.0000	0.7838	0.8107
CHC	0.9813	0.9522	0.9754	0.8426	0.9725	0.9949	0.9875	0.9133
CNN	0.5452	0.2620	0.5102	0.7753	0.8346	0.8881	0.3264	0.7493
CoCoIS	0.9039	0.7550	0.8253	0.6562	0.8027	0.9585	0.9132	0.5885
CPruner	0.9443	0.9721	0.9551	0.8264	0.8596	0.9126	0.9773	0.8501
DROP3	0.8339	0.7888	0.7727	0.6718	0.9101	0.9747	0.7844	0.8351
ENN	0.2863	0.5857	0.2931	0.0312	0.0337	0.0337	0.4668	0.0815
ENNTh	0.5476	0.8293	0.5774	0.1224	0.0893	0.0814	0.7845	0.1013
ENRBF	0.2060	0.5335	0.5074	0.6000	0.0543	0.0769	0.6860	0.0571
Explore	0.9958	0.9691	0.9602	0.9512	0.9725	0.9957	0.9786	0.9220
FCNN	0.5743	0.4084	0.5169	0.7613	0.8758	0.9048	0.3492	0.8592
GCNN	0.1415	0.5733	0.2838	0.8525	0.2160	0.7466	0.3342	0.6790
GGA	0.9638	0.9198	0.9145	0.8290	0.9601	0.9879	0.9246	0.8888
HMNEI	0.5880	0.6902	0.4216	0.4130	0.6587	0.5503	0.5075	0.5542
IB3	0.6958	0.5026	0.6114	0.7845	0.8951	0.9544	0.4615	0.8405
ICF	0.8922	0.6453	0.6916	0.2884	0.8377	0.9528	0.7311	0.4360
IGA	0.9251	0.8999	0.8928	0.7708	0.9145	0.9628	0.8610	0.9100
IKNN	0.3308	0.0236	0.1053	0.0788	0.6660	0.6644	0.4664	0.8945
MCNN	0.9268	0.8043	0.9184	0.8027	0.9207	0.9749	0.9507	0.8549
MCS	0.6221	0.0000	0.5743	0.8217	0.8895	0.9153	0.4138	0.8824
MENN	0.5476	0.8565	0.5775	0.1310	0.0893	0.0836	0.7846	0.1297
MNV	0.5805	0.2642	0.5342	0.7833	0.8589	0.9019	0.3705	0.7747
ModelCS	0.1365	0.3098	0.1659	0.0021	0.0144	0.0240	0.2830	0.0384
MSS	0.2967	0.3128	0.3740	0.7114	0.7247	0.8210	0.2221	0.7834
Multiedit	0.3491	0.7468	0.4282	0.2877	0.0531	0.0456	0.5746	0.1308
NCNEdit	0.2684	0.3863	0.2866	0.0183	0.0356	0.0340	0.4613	0.0474
NRMCS	0.9938	0.8999	0.9456	0.9051	0.9813	0.9968	0.9550	0.9571
POP	0.0054	0.0184	0.0000	0.0000	0.0000	0.2214	0.0019	0.0000
PSC	0.7641	0.5556	0.5682	0.6983	0.8745	0.9456	0.5150	0.8153
PSRCG	0.5152	0.2355	0.4075	0.6662	0.8121	0.9067	0.2206	0.7062
Reconsistent	0.5859	0.3974	0.4641	0.6704	0.7784	0.8814	0.3309	0.6810
RMHC	0.9001	0.9043	0.9002	0.9001	0.9001	0.9013	0.9004	0.9043
RNG	0.2992	0.5467	0.2972	0.1191	0.0599	0.0348	0.4715	0.1683
RNN	0.9372	0.9198	0.8746	0.6917	0.9245	0.9903	0.9572	0.8834
Shrink	0.6509	0.3761	0.5862	0.8456	0.9513	0.9339	0.4186	0.8647
SNN	0.7312	0.7123	0.6303	0.8057	0.9245	0.9591	0.4617	0.8846
SSMA	0.9746	0.9235	0.9334	0.8524	0.9657	0.9928	0.9665	0.8792
SVBPS	0.6242	0.3929	0.6798	0.7024	0.9238	0.9347	0.3920	0.8371
TCNN	0.5381	0.5659	0.5088	0.7763	0.8496	0.8903	0.3315	0.8635
TRKNN	0.6080	0.4106	0.3681	0.2215	0.7010	0.9126	0.3745	0.3489
VSM	0.6305	0.1589	0.4270	0.2495	0.8720	0.9347	0.2961	0.5688

A.2 Additional experimental result of the medium data sets

Tables A.2.1 to A.2.3 are full experimental results for section 4.2.4 in which the medium data sets are considered. Table A.2.1 illustrates the names and labels of all medium data sets. Tables A.2.2 and A.2.3 show the accuracy and reduction result, respectively.

Table A.2.1 Label and name of medium data sets.

Label of data sets	Name of data set
1	banana
2	coil2000
3	magic
4	marketing
5	page-blocks
6	penbased
7	phoneme
8	ring
9	satimage
10	segment
11	spambase
12	texture
13	thyroid
14	titanic
15	twonorm

Table A.2.2 Accuracy results of medium data sets.

Methods	Data Set							
	1	2	3	4	5	6	7	8
Proposed	0.8877	0.9210	0.7772	0.2823	0.9526	0.9816	0.8677	0.8593
AllKNN	0.8934	0.9387	0.8328	0.2949	0.9563	0.9925	0.8732	0.6214
CCIS	0.8315	0.9403	0.7607	0.1962	0.6003	0.8798	0.7929	0.6942
CHC	0.8943	0.9403	0.8146	0.3080	0.9415	0.9564	0.8244	0.8592
CNN	0.8664	0.8440	0.7695	0.2553	0.9490	0.9830	0.8756	0.8273
CPruner	0.8972	0.9403	0.8091	0.2687	0.9340	0.9783	0.8072	0.5234
DROP3	0.8696	0.9039	0.7567	0.2774	0.8090	0.9431	0.8190	0.8499
FCNN	0.8655	0.8469	0.7670	0.2595	0.9474	0.9855	0.8773	0.8292
GGA	0.8860	0.9343	0.7992	0.2739	0.9508	0.9833	0.8472	0.7528
HMNEI	0.8906	0.8762	0.8293	0.2999	0.9558	0.9912	0.8766	0.8008
IB3	0.8442	0.9353	0.7543	0.2459	0.9466	0.9807	0.8338	0.8353
ICF	0.8081	0.8602	0.6828	0.2680	0.5554	0.8927	0.7483	0.7264
MCNN	0.5900	0.6416	0.7281	0.2592	0.7361	0.9728	0.7544	0.6478
MENN	0.8970	0.9402	0.8338	0.2960	0.9532	0.9924	0.8699	0.5726
ModelCS	0.8877	0.9238	0.8207	0.2740	0.9620	0.9935	0.8953	0.7855
MSS	0.8721	0.8691	0.7880	0.2627	0.9556	0.9913	0.8882	0.8207
NRMCS	0.8179	0.9281	0.8162	0.2879	0.9510	0.8136	0.8662	0.7845
POP	0.8745	0.8866	0.8059	0.2710	0.9556	0.9935	0.8975	0.7524
Reconsistent	0.8206	0.7666	0.7351	0.2540	0.9101	0.9882	0.8512	0.6704
RMHC	0.8972	0.9376	0.8289	0.3077	0.9549	0.9875	0.8660	0.9128
RNG	0.8930	0.9390	0.8343	0.3129	0.9592	0.9931	0.8877	0.7436
RNN	0.8734	0.9335	0.7911	0.2658	0.9519	0.9834	0.8560	0.8303
TCNN	0.8628	0.8439	0.7697	0.2541	0.9368	0.9851	0.8780	0.8295
SSMA	0.8964	0.9400	0.8203	0.3087	0.9510	0.9813	0.8570	0.9286

Table A.2.2 Accuracy results of medium data sets (cont.).

Methods	Data set						
	9	10	11	12	13	14	15
Proposed	0.8814	0.9255	0.7775	0.9649	0.9209	0.6770	0.9211
AllKNN	0.9001	0.9515	0.8952	0.9858	0.9378	0.6924	0.9584
CCIS	0.5454	0.8606	0.7957	0.8196	0.7299	0.7310	0.9473
CHC	0.8720	0.9143	0.8610	0.9225	0.9396	0.7892	0.9636
CNN	0.8855	0.9403	0.8601	0.9702	0.9004	0.5316	0.9027
CPruner	0.8662	0.9100	0.8584	0.9518	0.9333	0.6592	0.9599
DROP3	0.8308	0.9100	0.8218	0.9125	0.8581	0.4498	0.8992
FCNN	0.8827	0.9481	0.8486	0.9771	0.8997	0.6152	0.9000
GGA	0.8880	0.9351	0.8714	0.9593	0.9329	0.7892	0.9515
HMNEI	0.9038	0.9528	0.8928	0.9807	0.8999	0.7424	0.9636
IB3	0.8712	0.9377	0.8464	0.9644	0.9351	0.7665	0.8984
ICF	0.6980	0.8121	0.5743	0.8593	0.6321	0.4707	0.8234
MCNN	0.8600	0.9069	0.7333	0.9245	0.5078	0.6770	0.9114
MENN	0.9004	0.9485	0.8871	0.9836	0.9379	0.3230	0.9616
ModelCS	0.9063	0.9632	0.9017	0.9904	0.9344	0.7265	0.9530
MSS	0.9009	0.9511	0.8832	0.9873	0.9161	0.6075	0.9257
NRMCS	0.8904	0.9368	0.8673	0.9662	0.9006	0.3230	0.9330
POP	0.9049	0.9662	0.8828	0.9905	0.9132	0.6075	0.9468
Reconsistent	0.8848	0.9416	0.7931	0.9720	0.7668	0.3839	0.9303
RMHC	0.8981	0.9489	0.8967	0.9716	0.9336	0.7728	0.9542
RNG	0.9077	0.9610	0.9010	0.9893	0.9415	0.7379	0.9562
RNN	0.8782	0.9459	0.8682	0.9704	0.9226	0.7406	0.9358
TCNN	0.8833	0.9511	0.8503	0.9745	0.9024	0.4812	0.9012
SSMA	0.8867	0.9511	0.8828	0.9613	0.9414	0.7351	0.9634

Table A.2.3 Reduction ratio of medium data sets.

Methods	Data Set							
	1	2	3	4	5	6	7	8
Proposed	0.9507	0.9665	0.8849	0.8208	0.9700	0.9652	0.8943	0.8664
AllKNN	0.1758	0.1141	0.2534	0.8218	0.0588	0.0096	0.1597	0.3090
CCIS	0.9877	0.9998	0.9847	0.6101	0.9852	0.9930	0.9836	0.9527
CHC	0.9953	0.9999	0.9985	0.9981	0.9973	0.9859	0.9955	0.9962
CNN	0.7729	0.7383	0.6412	0.1672	0.8996	0.9564	0.7568	0.7361
CPruner	0.8636	0.8467	0.9214	0.9844	0.8349	0.8467	0.8511	0.9464
DROP3	0.9151	0.9503	0.8819	0.8393	0.9630	0.9719	0.8550	0.7812
FCNN	0.8010	0.7850	0.6594	0.1832	0.9110	0.9569	0.7743	0.7862
GGA	0.9135	0.9040	0.8868	0.8947	0.9185	0.9070	0.9019	0.8935
HMNEI	0.3617	0.8145	0.4803	0.6069	0.3127	0.3551	0.3873	0.7715
IB3	0.8711	0.3342	0.7854	0.2498	0.8583	0.9632	0.8324	0.8386
ICF	0.8635	0.8727	0.8649	0.8154	0.9380	0.9237	0.7767	0.8592
MCNN	0.9973	0.9984	0.9988	0.9844	0.9891	0.9802	0.9951	0.9984
MENN	0.2404	0.2093	0.3675	0.9161	0.0912	0.0162	0.2609	0.4025
ModelCS	0.0746	0.0425	0.0984	0.3867	0.0217	0.0035	0.0519	0.1219
MSS	0.7027	0.5997	0.5066	0.1059	0.8579	0.9051	0.6614	0.4479
NRMCS	0.9982	0.9577	0.8699	0.9524	0.9659	0.9988	0.8891	0.9474
POP	0.1249	0.1622	0.0012	0.0014	0.3732	0.0000	0.1095	0.0000
Reconsistent	0.7707	0.8068	0.7013	0.1875	0.8984	0.8364	0.7190	0.6811
RMHC	0.9000	0.9000	0.9000	0.9000	0.9001	0.9000	0.9001	0.9000
RNG	0.1170	0.0659	0.1657	0.7012	0.0400	0.0143	0.1110	0.1177
RNN	0.9802	0.9942	0.9008	0.9830	0.9700	0.9708	0.8923	0.9686
TCNN	0.7983	0.7545	0.6417	0.2007	0.9164	0.9563	0.7644	0.7337
SSMA	0.9879	0.9999	0.9808	0.9825	0.9916	0.9821	0.9752	0.9902

Table A.2.3 Reduction ratio of medium data sets (cont.).

Methods	Data Set						
	9	10	11	12	13	14	15
Proposed	0.9164	0.9112	0.8723	0.9419	0.9209	0.9899	0.9301
AllKNN	0.1326	0.0604	0.1622	0.0172	0.1118	0.4267	0.0750
CCIS	0.9817	0.9783	0.9902	0.9880	0.9521	0.9899	0.9936
CHC	0.9949	0.9860	0.9946	0.9863	0.9991	0.9980	0.9979
CNN	0.8040	0.8852	0.7460	0.9251	0.8079	0.5319	0.8299
CPruner	0.9046	0.8487	0.8541	0.8565	0.8462	0.9965	0.9108
DROP3	0.9101	0.9156	0.8870	0.9486	0.9566	0.8834	0.9531
FCNN	0.8196	0.8985	0.7925	0.9279	0.8354	0.4501	0.8491
GGA	0.9084	0.9273	0.9076	0.9140	0.9106	0.9471	0.9112
HMNEI	0.4091	0.3378	0.4634	0.3440	0.7347	0.9931	0.5627
IB3	0.8496	0.9112	0.8497	0.9371	0.3764	0.9166	0.9083
ICF	0.8385	0.7846	0.8834	0.8590	0.9395	0.4002	0.9798
MCNN	0.9853	0.9703	0.9956	0.9790	0.9946	0.9990	0.9976
MENN	0.1958	0.0905	0.2427	0.0346	0.1457	0.9850	0.1217
ModelCS	0.0414	0.0141	0.0413	0.0037	0.0412	0.0032	0.0198
MSS	0.6841	0.8357	0.5690	0.8533	0.6998	0.0117	0.6226
NRMCS	0.9281	0.9534	0.9152	0.9696	0.9811	0.9990	0.9997
POP	0.0125	0.0000	0.1371	0.0000	0.3742	0.1803	0.0000
Reconsistent	0.7253	0.8010	0.7845	0.8524	0.8678	0.0461	0.7128
RMHC	0.9000	0.9004	0.9002	0.9000	0.9000	0.9000	0.9000
RNG	0.0868	0.0444	0.0939	0.0188	0.0570	0.2244	0.0367
RNN	0.9470	0.9270	0.9148	0.9332	0.9794	0.9985	0.9800
TCNN	0.8048	0.8915	0.7762	0.9272	0.8164	0.4822	0.8290
SSMA	0.9811	0.9713	0.9805	0.9753	0.9982	0.9960	0.9952

A.3 Experimental result of the large data sets

The last two tables demonstrate the full experimental result of the large data sets in section 4.2.5. The accuracy and reduction results are shown as following.

Table A.3.1 Accuracy results of large data sets.

Methods	Data Sets				
	adult	census	connect-4	fars	shuttle
Proposed	0.7489	0.9359	0.6729	0.6658	0.9948
CCIS	0.8065	0.9380	0.6288	0.6915	0.9952
DROP3	0.7859	0.9105	0.6493	0.7444	0.9665
FCNN	0.7495	0.8712	0.6231	0.7161	0.9991
MCNN	0.7209	0.7623	0.3437	0.6337	0.7402
HMNEI	0.8190	0.8990	0.6388	0.7392	0.9974
RMHC	0.8169	0.9381	0.6722	0.7548	0.9972
RNG	0.8242	0.9424	0.6825	0.7642	0.9973
SSMA	0.8277	0.9428	0.6752	0.7573	0.9975

Table A.3.2 Reduction ratio of large data sets.

Methods	Data Set				
	adult	census	connect-4	fars	shuttle
Proposed	0.8968	0.9722	0.8422	0.8707	0.9959
CCIS	0.9802	0.9988	0.8120	0.8242	0.9975
DROP3	0.8738	0.9537	0.7839	0.8600	0.9915
FCNN	0.6656	0.8446	0.4714	0.6138	0.9934
HMNEI	0.6471	0.8535	0.7901	0.5693	0.3845
MCNN	0.9996	0.9999	0.9990	0.9985	0.9989
RMHC	0.9006	0.9009	0.9006	0.9005	0.9004
RNG	0.2158	0.0666	0.3494	0.2950	0.0085
SSMA	0.9896	0.9975	0.9800	0.9723	0.9981

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