Fusion of linear base classifiers in geometric space

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Experiment 2 – Imbalanced datasets

Table 1. Results of the global Wilcoxon rank-sum test for various sizes of the classifier pool regarding BAC.

Pool size	L (1)	MV (2)	M (3)	NM (4)	Pool size	L (1)	MV (2)	M (3)	NM (4)
3	1.859	2.435	2.924	2.783	29	1.652	2.522	2.859	2.967
	—	1	1, 2	1, 2		—	1	1	1, 2
5	1.663	2.511	3.196	2.63	31	1.630	2.522	2.870	2.978
	—	1	all	1		—	1	1	1, 2
7	1.576	2.402	3.120	2.902	33	1.609	2.478	2.891	3.022
	—	1	1, 2	1, 2		—	1	1, 2	1, 2
9	1.489	2.380	3.130	3.000	35	1.630	2.565	2.989	2.815
	—	1	1, 2	1, 2		—	1	1, 2	1
11	1.500	2.457	3.098	2.946	37	1.674	2.543	2.859	2.924
	—	1	1, 2	1, 2		—	1	1	1
13	1.565	2.326	3.011	3.098	39	1.652	2.543	2.837	2.967
	—	1	1, 2	1, 2		—	1	1	1, 2
15	1.511	2.391	2.848	3.250	41	1.652	2.543	2.946	2.859
	—	1	1, 2	1, 2		—	1	1	1
17	1.598	2.500	2.826	3.076	43	1.674	2.478	2.880	2.967
	—	1	1	1, 2		—	1	1	1, 2
19	1.609	2.370	2.859	3.163	45	1.674	2.522	2.859	2.946
	—	1	1, 2	1, 2		—	1	1	1, 2
21	1.609	2.478	2.793	3.120	47	1.717	2.543	2.772	2.967
	—	1	1	1, 2		—	1	1	1, 2
23	1.674	2.500	2.685	3.141	49	1.717	2.587	2.815	2.880
	—	1	1	1, 2		—	1	1	1
25	1.587	2.478	2.815	3.120	51	1.739	2.609	2.859	2.793
	—	1	1	1, 2		—	1	1	1
27	1.674	2.478	2.837	3.011	53	1.761	2.609	2.891	2.739
	—	1	1	1, 2		—	1	1	1

Table 2. Results of the global Wilcoxon rank-sum test for various sizes of the classifier pool regarding AUC.

Pool size	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**	**Pool size**	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**
3	1.859	2.413	2.924	2.804	29	1.652	2.543	2.837	2.967
	—	1	1, 2	1, 2		—	1	1	1
5	1.685	2.511	3.174	2.63	31	1.630	2.543	2.848	2.978
	—	1	all	1		—	1	1	1, 2
7	1.576	2.402	3.120	2.902	33	1.630	2.543	2.804	3.022
	—	1	1, 2	1, 2		—	1	1	1, 2
9	1.511	2.402	3.087	3.000	35	1.630	2.63	2.967	2.772
	—	1	1, 2	1, 2		—	1	1	1
11	1.565	2.5	2.989	2.946	37	1.674	2.609	2.815	2.902
	—	1	1, 2	1, 2		—	1	1	1
13	1.587	2.348	2.946	3.120	39	1.652	2.587	2.772	2.989
	—	1	1, 2	1, 2		—	1	1	1, 2
15	1.533	2.413	2.848	3.207	41	1.674	2.565	2.859	2.902
	—	1	1, 2	1, 2		—	1	1	1
17	1.598	2.5	2.826	3.076	43	1.674	2.522	2.815	2.989
	—	1	1	1, 2		—	1	1	1, 2
19	1.609	2.37	2.859	3.163	45	1.674	2.565	2.793	2.967
	—	1	1, 2	1, 2		—	1	1	1, 2
21	1.609	2.5	2.793	3.098	47	1.717	2.587	2.728	2.967
	—	1	1	1, 2		—	1	1	1, 2
23	1.696	2.522	2.685	3.098	49	1.761	2.652	2.75	2.837
	—	1	1	1, 2		—	1	1	1
25	1.630	2.543	2.793	3.033	51	1.783	2.63	2.815	2.772
	—	1	1	1, 2		—	1	1	1
27	1.696	2.543	2.837	2.924	53	1.826	2.652	2.783	2.739
	—	1	1	1		—	1	1	1

Table 3. Results of the global Wilcoxon rank-sum test for various sizes of the classifier pool regarding RRSE.

Pool size	L (1)	MV (2)	M (3)	NM (4)	Pool size	L (1)	MV (2)	M (3)	NM (4)
3	1.967	2.315	3.033	2.685	29	1.696	2.587	2.826	2.891
	—	1	all	1, 2		—	1	1	1
5	1.489	2.511	3.207	2.793	31	1.674	2.674	2.837	2.815
	—	1	all	1		—	1	1	1
7	1.511	2.467	3.163	2.859	33	1.696	2.63	2.815	2.859
	—	1	all	1, 2		—	1	1	1
9	1.533	2.489	3.087	2.891	35	1.761	2.674	2.902	2.663
	—	1	1, 2	1, 2		—	1	1	1
11	1.522	2.478	3.087	2.913	37	1.739	2.63	2.902	2.728
	—	1	1, 2	1, 2		—	1	1	1
13	1.587	2.391	3.011	3.011	39	1.761	2.674	2.859	2.707
	—	1	1, 2	1, 2		—	1	1	1
15	1.576	2.5	2.793	3.130	41	1.717	2.696	2.88	2.707
	—	1	1	1, 2		—	1	1	1
17	1.576	2.63	2.707	3.087	43	1.717	2.674	2.859	2.750
	—	1	1	1, 2		—	1	1	1
19	1.565	2.543	2.815	3.076	45	1.739	2.652	2.75	2.859
	—	1	1	1, 2		—	1	1	1
21	1.565	2.609	2.772	3.054	47	1.761	2.652	2.707	2.880
	—	1	1	1, 2		—	1	1	1
23	1.587	2.652	2.826	2.935	49	1.739	2.652	2.815	2.793
	—	1	1	1		—	1	1	1
25	1.652	2.63	2.826	2.891	51	1.783	2.63	2.815	2.772
	—	1	1	1		—	1	1	1
27	1.696	2.609	2.804	2.891	53	1.826	2.674	2.717	2.783
	—	1	1	1		—	1	1	1

Table 4. Results of the global Wilcoxon rank-sum test for various sizes of the classifier pool regarding *G-mean*.

Pool size	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**	**Pool size**	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**
3	1.924	2.326	3.011	2.739	29	1.717	2.500	2.750	3.033
	—	1	1, 2	1, 2		—	1	1	1, 2
5	1.620	2.424	3.239	2.717	31	1.652	2.587	2.826	2.935
	—	1	all	1		—	1	1	1
7	1.446	2.446	3.185	2.924	33	1.609	2.652	2.761	2.978
	—	1	1, 2	1, 2		—	1	1	1
9	1.446	2.402	3.196	2.957	35	1.630	2.652	2.837	2.880
	—	1	1, 2	1, 2		—	1	1	1
11	1.435	2.587	2.946	3.033	37	1.674	2.652	2.815	2.859
	—	1	1	1, 2		—	1	1	1
13	1.543	2.391	2.924	3.141	39	1.652	2.652	2.815	2.880
	—	1	1, 2	1, 2		—	1	1	1
15	1.511	2.391	2.761	3.337	41	1.696	2.630	2.880	2.793
	—	1	1	all		—	1	1	1
17	1.576	2.500	2.804	3.120	43	1.717	2.609	2.815	2.859
	—	1	1	1, 2		—	1	1	1
19	1.543	2.326	2.924	3.207	45	1.717	2.609	2.815	2.859
	—	1	1, 2	1, 2		—	1	1	1
21	1.543	2.435	2.859	3.163	47	1.717	2.696	2.750	2.837
	—	1	1	1, 2		—	1	1	1
23	1.609	2.565	2.772	3.054	49	1.783	2.652	2.750	2.815
	—	1	1	1, 2		—	1	1	1
25	1.652	2.413	2.793	3.141	51	1.739	2.674	2.859	2.728
	—	1	1	1, 2		—	1	1	1
27	1.674	2.413	2.793	3.120	53	1.761	2.652	2.891	2.696
	—	1	1	1, 2		—	1	1	1

Table 5. Results of the global Wilcoxon rank-sum test for various sizes of the classifier pool regarding F_1 *score*.

Pool size	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**	**Pool size**	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**
3	1.772	2.315	3.120	2.793	29	1.652	2.543	2.837	2.967
	—	1	all	1, 2		—	1	1	1
5	1.511	2.467	3.283	2.739	31	1.652	2.543	2.870	2.935
	—	1	all	1		—	1	1	1
7	1.424	2.446	3.120	3.011	33	1.674	2.630	2.783	2.913
	—	1	1, 2	1, 2		—	1	1	1
9	1.402	2.337	3.217	3.043	35	1.674	2.696	2.859	2.772
	—	1	1, 2	1, 2		—	1	1	1
11	1.413	2.413	3.120	3.054	37	1.696	2.674	2.783	2.848
	—	1	1, 2	1, 2		—	1	1	1
13	1.391	2.370	3.054	3.185	39	1.717	2.652	2.815	2.815
	—	1	1, 2	1, 2		—	1	1	1
15	1.402	2.446	2.804	3.348	41	1.717	2.696	2.859	2.728
	—	1	1	all		—	1	1	1
17	1.380	2.500	2.891	3.228	43	1.761	2.63	2.793	2.815
	—	1	1	1, 2		—	1	1	1
19	1.478	2.413	2.924	3.185	45	1.717	2.674	2.728	2.880
	—	1	1, 2	1, 2		—	1	1	1
21	1.435	2.543	2.859	3.163	47	1.761	2.696	2.707	2.837
	—	1	1	1, 2		—	1	1	1
23	1.500	2.522	2.880	3.098	49	1.761	2.717	2.750	2.772
	—	1	1	1, 2		—	1	1	1
25	1.609	2.533	2.837	3.022	51	1.783	2.674	2.859	2.685
	—	1	1	1, 2		—	1	1	1
27	1.565	2.565	2.837	3.033	53	1.783	2.696	2.870	2.652
	—	1	1	1, 2		—	1	1	1

Table 6. Results of the global Wilcoxon rank-sum test for various sizes of the classifier pool regarding *precision*.

Pool size	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**	**Pool size**	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**
3	2.348	2.402	2.685	2.565	29	3.033	2.522	2.109	2.337
	—	—	—	—		all	3	—	—
5	2.228	2.446	2.674	2.652	31	3.043	2.576	2.043	2.337
	—	—	1	1		all	3	—	—
7	2.391	2.598	2.402	2.609	33	3.033	2.663	2.033	2.272
	—	—	—	—		all	3, 4	—	—
9	2.424	2.533	2.402	2.641	35	3.043	2.641	2.076	2.239
	—	—	—	—		all	3, 4	—	—
11	2.587	2.467	2.402	2.543	37	3.065	2.587	2.087	2.261
	—	—	—	—		all	3, 4	—	—
13	2.576	2.478	2.402	2.543	39	3.076	2.598	2.065	2.261
	—	—	—	—		all	3, 4	—	—
15	2.685	2.522	2.185	2.609	41	3.076	2.620	2.065	2.239
	3	—	—	3		all	3, 4	—	—
17	2.761	2.543	2.141	2.554	43	3.054	2.587	2.011	2.348
	3	—	—	3		all	3	—	—
19	2.793	2.533	2.120	2.554	45	3.054	2.609	2.054	2.283
	3	—	—	3		all	3, 4	—	—
21	2.826	2.522	2.141	2.511	47	3.011	2.576	2.054	2.359
	3	—	—	—		all	3	—	—
23	2.913	2.587	2.141	2.359	49	3.033	2.630	2.076	2.261
	3, 4	3	—	—		all	3, 4	—	—
25	2.946	2.565	2.152	2.337	51	3.022	2.554	2.130	2.293
	all	—	—	—		all	3	—	—
27	3.000	2.511	2.141	2.348	53	3.033	2.576	2.163	2.228
	all	—	—	—		all	4	—	—

Table 7. Results of the global Wilcoxon rank-sum test for various sizes of the classifier pool regarding *recall*.

Pool size	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**	**Pool size**	**L (1)**	**MV (2)**	**M (3)**	**NM (4)**
3	1.793	2.457	3.011	2.739	29	1.543	2.543	2.924	2.989
	—	1	1, 2	1		—	1	1	1, 2
5	1.598	2.467	3.196	2.739	31	1.543	2.565	2.913	2.978
	—	1	all	1		—	1	1	1, 2
7	1.511	2.337	3.207	2.946	33	1.478	2.543	2.913	3.065
	—	1	1, 2	1, 2		—	1	1	1, 2
9	1.359	2.467	3.217	2.957	35	1.522	2.630	2.967	2.880
	—	1	1, 2	1, 2		—	1	1	1
11	1.370	2.478	3.141	3.011	37	1.522	2.587	2.902	2.989
	—	1	1, 2	1, 2		—	1	1	1, 2
13	1.413	2.370	3.054	3.163	39	1.500	2.587	2.891	3.022
	—	1	1, 2	1, 2		—	1	1	1, 2
15	1.370	2.478	2.880	3.272	41	1.543	2.565	2.935	2.957
	—	1	1	1, 2		—	1	1	1, 2
17	1.446	2.457	2.957	3.141	43	1.587	2.543	2.870	3.000
	—	1	1, 2	1, 2		—	1	1	1, 2
19	1.478	2.348	2.946	3.228	45	1.565	2.565	2.870	3.000
	—	1	1, 2	1, 2		—	1	1	1, 2
21	1.478	2.478	2.902	3.141	47	1.630	2.565	2.815	2.989
	—	1	1	1, 2		—	1	1	1, 2
23	1.500	2.500	2.772	3.228	49	1.652	2.587	2.826	2.935
	—	1	1	1, 2		—	1	1	1
25	1.478	2.522	2.815	3.185	51	1.630	2.587	2.957	2.826
	—	1	1	1, 2		—	1	1	1
27	1.413	2.478	2.880	3.228	53	1.652	2.620	2.957	2.772
	—	1	1	1, 2		—	1	1	1

Table 8. Results of the global Wilcoxon rank-sum test for various sizes of the classifier pool regarding *specificity*.

Pool size	L (1)	MV (2)	M (3)	NM (4)	Pool size	L (1)	MV (2)	M (3)	NM (4)
3	2.174	2.446	2.728	2.652	29	2.587	2.587	2.163	2.663
	—	—	1	1		—	—	—	3
5	2.033	2.435	2.902	2.63	31	2.630	2.696	2.098	2.576
	—	—	1, 2	1		3	3	—	3
7	2.054	2.424	2.946	2.576	33	2.565	2.652	2.076	2.707
	—	—	1, 2	1		—	3	—	3
9	2.022	2.413	2.837	2.728	35	2.630	2.696	2.196	2.478
	—	—	1, 2	1		—	3	—	—
11	2.120	2.348	2.685	2.848	37	2.630	2.674	2.196	2.500
	—	—	1	1, 2		—	3	—	—
13	2.152	2.380	2.761	2.707	39	2.696	2.652	2.152	2.500
	—	—	1	1		3	3	—	—
15	2.250	2.478	2.326	2.946	41	2.652	2.674	2.217	2.457
	—	—	—	all		—	3	—	—
17	2.293	2.543	2.348	2.815	43	2.652	2.674	2.109	2.565
	—	—	—	1, 3		3	3	—	—
19	2.239	2.522	2.446	2.793	45	2.630	2.674	2.174	2.522
	—	—	—	1		—	3	—	—
21	2.391	2.457	2.283	2.870	47	2.609	2.609	2.217	2.565
	—	—	—	3		—	—	—	—
23	2.500	2.543	2.337	2.620	49	2.587	2.652	2.217	2.543
	—	—	—	—		—	—	—	—
25	2.478	2.543	2.402	2.576	51	2.630	2.652	2.174	2.543
	—	—	—	—		—	3	—	—
27	2.587	2.587	2.217	2.609	53	2.641	2.674	2.239	2.446
	—	—	—	—		—	—	—	—

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