

Supplementary File:

BMFS: Bidirectional weighted approach for multi-label feature selection algorithm

Weiguo Yi¹, Bin Ma¹, and Lingwei Yan^{2*}

1. School of Computer and Communication Engineering, Dalian Jiaotong University, Dalian, 116028, China
2. School of science, Dalian Jiaotong University, Dalian, 116028, China
[*corresponding.yanlingwei791@163.com](mailto:corresponding.yanlingwei791@163.com)

In this supplementary materials, the details of experimental results are provided.

Table 1 shows the experimental data supporting Figure 3 of the original paper that the performance of different algorithms with different feature proportions is different, and the performance curves of each algorithm tend to be stable when the proportion is 30 percent to 40 percent.

Tables 2- 4 represent the experimental data supporting Figures 4- 6 of the original paper visually present the performance comparison of the average precision, Hamming loss and ranking loss of the eight algorithms on the 10 datasets.

Table 1 The Average Precision of different algorithms with different feature proportions

Algorithm	different feature proportions									
	4	8	12	16	20	24	28	32	36	40
PPT-CHI	0.64	0.701	0.721	0.7215	0.74	0.7401	0.73	0.7403	0.736	0.74
PPT-MI	0.658	0.708	0.711	0.702	0.73	0.732	0.741	0.74	0.736	0.738
PMU	0.63	0.675	0.664	0.679	0.681	0.678	0.692	0.718	0.708	0.706
SCLS	0.64	0.711	0.6736	0.709	0.688	0.686	0.69	0.697	0.694	0.695
CFSM	0.632	0.653	0.701	0.704	0.693	0.71	0.723	0.716	0.719	0.718
MUCO	0.651	0.716	0.67	0.7	0.66	0.68	0.704	0.712	0.706	0.698
MFSR	0.66	0.713	0.72	0.703	0.695	0.68	0.7	0.704	0.71	0.71
BMFS	0.682	0.718	0.737	0.742	0.744	0.745	0.744	0.745	0.744	0.745

Table 2 The Average Precision of the eight algorithms on the 10 datasets.

	PPT-CHI	PPT-MI	PMU	SCLS	CFSM	MUCO	MFSR	BMFS
Medical	0.77	0.7787	0.77	0.77	0.7566	0.7914	0.4235	0.8501
Image	0.7568	0.8109	0.7584	0.7509	0.7678	0.7577	0.7566	0.8345
Flags	0.7864	0.7932	0.8035	0.799	0.7849	0.7578	0.6047	0.8176
Scene	0.7445	0.7515	0.7541	0.7502	0.6347	0.8525	0.7702	0.7983
Emotions	0.7352	0.7473	0.7067	0.7337	0.7353	0.7715	0.7859	0.7945
Birds	0.6908	0.6946	0.7061	0.7038	0.6839	0.6889	0.7159	0.749
Yeast	0.6888	0.6956	0.7024	0.6966	0.6931	0.7558	0.7522	0.703
Reference	0.6175	0.6338	0.6285	0.6234	0.6001	0.6439	0.6086	0.647
Recreation	0.4699	0.4924	0.4807	0.4647	0.4888	0.5088	0.4787	0.52
CAL500	0.4418	0.4418	0.4407	0.4409	0.4407	0.4827	0.4901	0.4926

Table 3 The Hamming Loss of eight algorithms on the 10 datasets.

	PPT-CHI	PPT-MI	PMU	SCLS	CFSM	MUCO	MFSR	BMFS
Medical	0.0173	0.0272	0.0173	0.0167	0.0186	0.0172	0.0281	0.0156
Recreation	0.0612	0.0329	0.0611	0.0308	0.0416	0.0595	0.0235	0.0256
Reference	0.0315	0.0303	0.0303	0.0305	0.031	0.0291	0.0325	0.0296
Birds	0.0489	0.0476	0.0492	0.0492	0.051	0.0567	0.0575	0.0472
Scene	0.1132	0.114	0.1064	0.1064	0.1431	0.1021	0.1302	0.0916
CAL500	0.1471	0.1471	0.148	0.148	0.1477	0.1398	0.139	0.138
Image	0.1932	0.1625	0.192	0.1942	0.194	0.191	0.1885	0.1516
Emotions	0.2005	0.1983	0.2259	0.2259	0.2062	0.2301	0.2105	0.1966
Yeast	0.2075	0.209	0.2104	0.2068	0.205	0.2	0.2017	0.208
Flags	0.297	0.2977	0.2756	0.264	0.2768	0.2698	0.2885	0.2593

Table 4 The Ranking Loss of eight algorithms on the 10 datasets.

	PPT-CHI	PPT-MI	PMU	SCLS	CFSM	MUCO	MFSR	BMFS
Medical	0.0641	0.0578	0.0642	0.1327	0.0614	0.0607	0.1375	0.0373
Reference	0.0916	0.0875	0.0857	0.09	0.0864	0.0822	0.091	0.0774
Birds	0.1251	0.1217	0.1208	0.1267	0.1253	0.12	0.1021	0.1187
Image	0.2051	0.2039	0.2037	0.2141	0.149	0.2038	0.2085	0.1333
Scene	0.1425	0.1405	0.1431	0.1407	0.2217	0.0914	0.1482	0.1361
Recreation	0.1879	0.1893	0.1801	0.18	0.1819	0.1735	0.1803	0.1705
Emotions	0.2214	0.2138	0.2525	0.2165	0.219	0.2301	0.1929	0.208
Flags	0.2613	0.2559	0.2403	0.2366	0.255	0.2374	0.2269	0.2177
Yeast	0.2368	0.2299	0.2232	0.2253	0.232	0.1745	0.191	0.2231
CAL500	0.2237	0.2237	0.2236	0.2236	0.2238	0.1895	0.1833	0.2233