Data set	Hamming loss↓						
	GRRO	GRRO-LS	PMU	MDMR	FIMF	SCLS	MICO
Bibtex	0.0137±0.0003	**0.0136±0.0004**	0.0151±0.0000	0.0141±0.0001	0.0147±0.0002	0.0138±0.0002	0.0138±0.0003
Birds	0.0537±0.0038	0.0551±0.0025	0.0688±0.0027	0.0630±0.0020	0.0645±0.0022	0.0595±0.0021	**0.0523±0.0022**
Corel5k	0.0095±0.0000	**0.0094±0.0000**	**0.0094±0.0000**	**0.0094±0.0000**	**0.0094±0.0000**	0.0095±0.0000	0.0095±0.0000
Corel16k001	0.0188±0.0000	0.0188±0.0000	0.0188±0.0000	**0.0187±0.0000**	0.0188±0.0000	0.0188±0.0000	0.0188±0.0000
Corel16k002	**0.0174±0.0000**	**0.0174±0.0000**	**0.0174±0.0000**	**0.0174±0.0000**	**0.0174±0.0000**	**0.0174±0.0000**	**0.0174±0.0000**
Emotions	**0.2326±0.0235**	0.2404±0.0294	0.2676±0.0406	0.2452±0.0208	0.2545±0.0366	0.2524±0.0162	0.2372±0.0180
Genbase	0.0070±0.0076	**0.0069±0.0077**	0.0094±0.0076	0.0075±0.0073	0.0079±0.0082	0.0070±0.0075	0.0076±0.0077
Image	0.2090±0.0132	0.2070±0.0137	0.2065±0.0111	**0.2029±0.0099**	0.2248±0.0119	0.2034±0.0113	0.2153±0.0134
Langlog	**0.0156±0.0001**	**0.0156±0.0001**	0.0158±0.0001	0.0157±0.0001	0.0158±0.0001	**0.0156±0.0002**	**0.0156±0.0003**
Medical	0.0142±0.0022	**0.0138±0.0025**	0.0192±0.0008	0.0158±0.0020	0.0157±0.0024	0.0159±0.0017	0.0157±0.0019
Slashdot	0.0490±0.0008	**0.0486±0.0011**	0.0510±0.0005	0.0503±0.0007	0.0499±0.0007	0.0492±0.0007	0.0491±0.0008
Yeast	**0.2082±0.0093**	0.2086±0.0103	0.2117±0.0081	0.2142±0.0100	0.2140±0.0100	0.2088±0.0091	0.2085±0.0094
Arts	0.0589±0.0008	**0.0586±0.0011**	0.0611±0.0007	0.0596±0.0006	0.0611±0.0010	0.0592±0.0009	0.0592±0.0008
Business	**0.0274±0.0005**	**0.0274±0.0005**	0.0284±0.0002	0.0279±0.0004	0.0282±0.0003	0.0275±0.0004	**0.0274±0.0006**
Entertainment	0.0590±0.0025	**0.0585±0.0024**	0.0650±0.0007	0.0612±0.0009	0.0645±0.0016	0.0591±0.0017	0.0600±0.0026
Health	0.0404±0.0020	**0.0403±0.0019**	0.0439±0.0013	0.0427±0.0012	0.0425±0.0015	0.0417±0.0016	0.0411±0.0017
Recreation	0.0574±0.0014	**0.0572±0.0015**	0.0650±0.0002	0.0585±0.0009	0.0616±0.0014	0.0576±0.0012	0.0574±0.0015
Reference	**0.0285±0.0008**	0.0286±0.0008	0.0302±0.0004	0.0300±0.0004	0.0296±0.0008	0.0288±0.0009	0.0288±0.0009
Science	0.0337±0.0004	**0.0336±0.0005**	0.0355±0.0002	0.0346±0.0002	0.0345±0.0002	0.0340±0.0003	0.0337±0.0004
Social	**0.0240±0.0018**	0.0245±0.0015	0.0254±0.0010	0.0253±0.0011	0.0246±0.0013	0.0245±0.0014	0.0243±0.0020

Table 1: Comparison results of multi-label feature selection methods (mean±std. deviation) in terms of *Hamming loss*

Data set	Ranking loss↓						
	GRRO	GRRO-LS	PMU	MDMR	FIMF	SCLS	MICO
Bibtex	0.2060±0.0343	**0.1986±0.0334**	0.2936±0.0107	0.2299±0.0099	0.2808±0.0161	0.2044±0.0231	0.2146±0.0306
Birds	**0.1265±0.0085**	0.1284±0.0145	0.1352±0.0091	0.1266±0.0101	0.1347±0.0119	0.1380±0.0133	0.1404±0.0172
Corel5k	0.1376±0.0030	**0.1358±0.0038**	0.1414±0.0008	0.1417±0.0007	0.1414±0.0008	0.1382±0.0023	0.1377±0.0031
Corel16k001	0.1867±0.0024	**0.1864±0.0026**	0.1917±0.0005	0.1898±0.0005	0.1914±0.0005	0.1869±0.0023	0.1869±0.0023
Corel16k002	**0.1840±0.0027**	0.1844±0.0025	0.1900±0.0003	0.1875±0.0009	0.1899±0.0006	0.1841±0.0026	0.1842±0.0026
Emotions	**0.1939±0.0330**	0.2058±0.0497	0.2563±0.0678	0.2222±0.0310	0.2311±0.0657	0.2202±0.0198	0.1970±0.0272
Genbase	0.0152±0.0208	0.0149±0.0206	0.0154±0.0210	0.0136±0.0197	0.0166±0.0229	**0.0134±0.0198**	0.0158±0.0199
Image	0.2379±0.0452	0.2415±0.0355	0.2352±0.0291	0.2296±0.0274	0.2674±0.0360	**0.2292±0.0292**	0.2455±0.0320
Langlog	**0.1559±0.0070**	0.1578±0.0065	0.1697±0.0030	0.1719±0.0029	0.1689±0.0060	0.1635±0.0045	0.1628±0.0035
Medical	0.0572±0.0189	**0.0571±0.0189**	0.0769±0.0123	0.0660±0.0150	0.0637±0.0176	0.0593±0.0181	0.0645±0.0168
Slashdot	0.1776±0.0084	**0.1769±0.0086**	0.1890±0.0038	0.1853±0.0046	0.1805±0.0081	0.1783±0.0089	0.1790±0.0080
Yeast	0.1834±0.0086	0.1834±0.0085	0.1843±0.0098	0.1848±0.0095	0.1895±0.0095	**0.1809±0.0096**	0.1841±0.0085
Arts	0.1529±0.0074	**0.1514±0.0087**	0.1610±0.0040	0.1569±0.0048	0.1565±0.0059	0.1517±0.0071	0.1533±0.0066
Business	**0.0417±0.0019**	0.0423±0.0015	0.0463±0.0019	0.0446±0.0010	0.0457±0.0019	0.0426±0.0015	0.0425±0.0017
Entertainment	0.1244±0.0077	**0.1222±0.0094**	0.1383±0.0067	0.1360±0.0028	0.1398±0.0086	0.1224±0.0081	0.1277±0.0084
Health	0.0595±0.0065	**0.0594±0.0065**	0.0657±0.0029	0.0641±0.0033	0.0629±0.0044	0.0615±0.0050	0.0610±0.0056
Recreation	0.1713±0.0141	**0.1692±0.0149**	0.2151±0.0034	0.1797±0.0089	0.1980±0.0110	0.1731±0.0113	0.1733±0.0123
Reference	0.0911±0.0065	**0.0894±0.0065**	0.0952±0.0034	0.0949±0.0034	0.0927±0.0055	**0.0894±0.0061**	0.0924±0.0058
Science	0.1355±0.0060	**0.1323±0.0076**	0.1464±0.0028	0.1408±0.0031	0.1434±0.0040	0.1378±0.0049	0.1367±0.0063
Social	0.0692±0.0040	**0.0670±0.0050**	0.0698±0.0024	0.0695±0.0027	0.0699±0.0031	0.0692±0.0029	0.0693±0.0044

Table 2: Comparison results of multi-label feature selection methods (mean±std. deviation) in terms of *ranking loss*

Data set	Coverage↓						
	GRRO	GRRO-LS	PMU	MDMR	FIMF	SCLS	MICO
Bibtex	51.6437±6.7074	**49.7307±6.7444**	70.6786±2.2860	58.2082±1.5127	68.4386±3.1677	52.8295±4.1288	53.5391±5.9541
Birds	3.4289±0.1930	3.4794±0.3516	3.5343±0.1960	**3.3506±0.2612**	3.5268±0.2989	3.6628±0.3294	3.7705±0.3478
Corel5k	118.1895±1.3484	**116.9965±1.7848**	120.0134±0.4417	120.2404±0.2992	120.0582±0.3424	118.6864±0.9077	118.0689±1.6269
Corel16k001	54.6822±0.4751	**54.5474±0.5011**	55.6810±0.1582	55.2638±0.1079	55.6159±0.0962	54.6832±0.4525	54.7239±0.4627
Corel16k002	57.9524±0.7138	58.1185±0.6073	59.4831±0.1020	58.8331±0.2057	59.4478±0.1564	**57.9403±0.6740**	58.0217±0.6529
Emotions	**2.0254±0.1679**	2.1012±0.2278	2.3276±0.2746	2.1849±0.1537	2.2080±0.3107	2.1499±0.1051	2.0531±0.1388
Genbase	0.7994±0.5837	0.7937±0.5769	0.8161±0.5847	0.7621±0.5354	0.8412±0.6398	**0.7547±0.5377**	0.8032±0.5492
Image	1.2286±0.1723	1.2439±0.1330	1.2151±0.1106	1.1906±0.1047	1.3325±0.1360	**1.1895±0.1119**	1.2449±0.1266
Langlog	12.1306±0.4346	**12.2364±0.4861**	13.1727±0.1777	13.3526±0.1857	13.0779±0.3903	12.6001±0.3404	12.6176±0.2493
Medical	3.6150±0.9269	**3.5965±0.9238**	4.6478±0.5466	4.0748±0.6961	3.9550±0.8314	3.7626±0.8582	4.0062±0.8024
Slashdot	4.2551±0.1712	**4.2462±0.1750**	4.4943±0.0792	4.4175±0.0928	4.3083±0.1620	4.2673±0.1800	4.2862±0.1594
Yeast	6.5744±0.1409	6.5656±0.1384	6.5941±0.1443	6.5953±0.1562	6.6960±0.1408	**6.5170±0.1618**	6.5874±0.1408
Arts	5.4977±0.1850	**5.4627±0.2188**	5.7285±0.0919	5.6201±0.1160	5.5977±0.1433	5.4702±0.1860	5.5154±0.1692
Business	**2.3250±0.0752**	2.3460±0.0570	2.5002±0.0758	2.4419±0.0329	2.4887±0.0707	2.3624±0.0553	2.3513±0.0659
Entertainment	3.3758±0.1665	**3.3112±0.2097**	3.6237±0.1426	3.5914±0.0777	3.6530±0.1884	3.3191±0.1770	3.4297±0.1803
Health	3.2805±0.2476	**3.2789±0.2531**	3.5095±0.0996	3.4566±0.1184	3.3977±0.1618	3.3358±0.1901	3.3422±0.2070
Recreation	4.7008±0.3113	**4.6550±0.3298**	5.5653±0.0735	4.8864±0.1956	5.2466±0.2143	4.7330±0.2433	4.7441±0.2690
Reference	3.5126±0.2117	**3.4543±0.2148**	3.6472±0.1198	3.6443±0.1181	3.5620±0.1848	3.4597±0.1998	3.5507±0.1926
Science	6.8652±0.2397	**6.7342±0.3224**	7.3058±0.1188	7.0887±0.1358	7.1885±0.1739	6.9508±0.2104	6.9108±0.2781
Social	3.6923±0.1530	**3.5840±0.2180**	3.7004±0.1091	3.6894±0.1140	3.6903±0.1364	3.6820±0.1184	3.6904±0.1801

Table 3: Comparison results of multi-label feature selection methods (mean±std. deviation) in terms of *coverage*

Data set	Average precision↑						
	GRRO	GRRO-LS	PMU	MDMR	FIMF	SCLS	MICO
Bibtex	0.3371±0.0758	**0.3526±0.0633**	0.1787±0.0131	0.2896±0.0208	0.2040±0.0235	0.3356±0.0485	0.3094±0.0601
Birds	**0.6981±0.0262**	0.6910±0.0253	0.6274±0.0166	0.6646±0.0119	0.6555±0.0147	0.6632±0.0171	0.6827±0.0275
Corel5k	0.2336±0.0078	**0.2425±0.0116**	0.2153±0.0031	0.2163±0.0031	0.2157±0.0030	0.2286±0.0054	0.2323±0.0077
Corel16k001	0.2591±0.0046	**0.2597±0.0052**	0.2499±0.0017	0.2560±0.0026	0.2496±0.0012	0.2573±0.0032	0.2588±0.0045
Corel16k002	0.2499±0.0044	0.2501±0.0042	0.2411±0.0010	0.2455±0.0022	0.2414±0.0014	0.2486±0.0038	**0.2503±0.0050**
Emotions	**0.7726±0.0278**	0.7555±0.0395	0.7185±0.0506	0.7457±0.0271	0.7359±0.0494	0.7443±0.0163	0.7671±0.0235
Genbase	0.9517±0.0956	0.9525±0.0940	0.9551±0.0966	**0.9584±0.0939**	0.9505±0.1022	**0.9584±0.0940**	0.9469±0.0964
Image	0.7240±0.0429	0.7228±0.0356	0.7265±0.0301	0.7319±0.0280	0.6882±0.0381	**0.7349±0.0309**	0.7127±0.0362
Langlog	**0.3095±0.0286**	0.3038±0.0226	0.2580±0.0113	0.2600±0.0108	0.2589±0.0157	0.2912±0.0188	0.2694±0.0112
Medical	0.7920±0.0827	**0.7998±0.0878**	0.6852±0.0453	0.7454±0.0656	0.7558±0.0783	0.7656±0.0757	0.7520±0.0747
Slashdot	**0.4767±0.0272**	0.4767±0.0291	0.4406±0.0122	0.4554±0.0147	0.4659±0.0236	0.4729±0.0263	0.4719±0.0244
Yeast	0.7432±0.0120	0.7435±0.0123	0.7417±0.0124	0.7397±0.0120	0.7360±0.0123	**0.7460±0.0132**	0.7422±0.0118
Arts	0.5106±0.0210	**0.5151±0.0247**	0.4861±0.0132	0.5021±0.0152	0.4923±0.0167	0.5120±0.0204	0.5076±0.0196
Business	**0.8739±0.0042**	0.8736±0.0036	0.8658±0.0036	0.8701±0.0026	0.8669±0.0037	0.8731±0.0030	0.8736±0.0040
Entertainment	0.5713±0.0329	**0.5755±0.0345**	0.5138±0.0161	0.5224±0.0098	0.5111±0.0202	0.5754±0.0307	0.5559±0.0315
Health	**0.7135±0.0231**	0.7118±0.0225	0.6763±0.0099	0.6870±0.0110	0.6902±0.0164	0.7001±0.0179	0.7025±0.0195
Recreation	0.5303±0.0351	**0.5368±0.0377**	0.3881±0.0102	0.5013±0.0198	0.4452±0.0291	0.5278±0.0303	0.5285±0.0341
Reference	0.6198±0.0223	**0.6207±0.0232**	0.5988±0.0100	0.5977±0.0089	0.6064±0.0196	0.6200±0.0198	0.6129±0.0224
Science	0.4747±0.0167	**0.4873±0.0218**	0.4303±0.0100	0.4582±0.0088	0.4542±0.0112	0.4677±0.0133	0.4774±0.0204
Social	0.7124±0.0150	**0.7168±0.0174**	0.6974±0.0077	0.6989±0.0112	0.7039±0.0097	0.7073±0.0124	0.7078±0.0156

Table 4: Comparison results of multi-label feature selection methods (mean±std. deviation) in terms of *average precision*