

Supplementary material for “Comprehensive comparison of multi-label methods for emotion detection”

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1 Supplementary tables

Symbol	Meaning
\mathcal{X}	d -dimensional instance space \mathcal{R}^d
\mathcal{Y}	q -dimensional label space with q possible class labels $\{y_1, y_2, \dots, y_q\}$
\mathbf{x}	d -dimensional feature vector $\mathbf{x} \in \mathcal{X}$
Y	Label set associated with \mathbf{x} , $Y \subseteq \mathcal{Y}$
\bar{Y}	Complementary label set of Y , $Y \cup \bar{Y} = \mathcal{Y}$
T	Multilabel training set $T = \{(\mathbf{x}_i, Y_i) 1 \leq i \leq m\}$
$h(\cdot)$	Multilabel classifier: $h : \mathcal{X} \rightarrow 2^{\mathcal{Y}}$, where $h(\mathbf{x})$ returns the set of predicted relevant labels of \mathbf{x}
$f(\cdot, \cdot)$	Real-valued function $f : \mathcal{X} \times \mathcal{Y} \rightarrow \mathbb{R}$, where $f(\mathbf{x}, y)$ returns the confidence of y being a relevant label of \mathbf{x}
$\text{rank}_f(\cdot, \cdot)$	Ranking function, $\text{rank}_f(\mathbf{x}, y)$ returns the rank of y in \mathcal{Y} based on the descending order induced from $f(\mathbf{x}, \cdot)$
$\llbracket \cdot \rrbracket$	$\llbracket \pi \rrbracket$ returns 1 if predicate π is true and 0 otherwise

Table 1: Summary of the notations used in this paper

Table 2: Information from the datasets used

Dataset	Language	Features	Labels	Instances	Card	Dens	AvgIR	CVIR
BFRC-PT	Portuguese	36654	8	8080	3.8606	0.4825	2.1650	0.3912
CancerEmo	English	10073	8	8466	1.1764	0.1470	5.2689	0.8385
CBET	English	20944	9	81163	1.0530	0.1170	1.2376	0.0981
cedr	Russian	32519	5	9410	1.0227	0.2045	2.1524	0.5135
EmoThreat	Urdu	34594	7	9750	1.2795	0.1827	2.8325	0.5158
ExaAEC	Arabic	15843	9	20050	1.0347	0.1149	1.3749	0.9299
GoEmotions	English	29512	28	54263	1.1759	0.0419	28.354	1.1985
MLEC-AML English	English	26480	7	26019	1.3425	0.1917	3.3176	0.9406
MLEC-AML Indo	Indonesian	8544	7	4207	1.1236	0.1605	6.0510	0.7572
NLPCC2018	Chinese	31884	5	6728	1.1667	0.2333	2.2719	0.3921
RED v2	Romanian	20646	7	5449	1.1321	0.1617	1.7289	0.3058
semEval2007	English	3363	6	1250	1.1651	0.1942	2.8052	0.8391
semEval2018 Arabic	Arabic	25080	11	4381	2.3063	0.2096	3.7904	1.3022
semEval2018 English	English	23133	11	10983	2.3743	0.2158	2.9972	0.8334
semEval2018 Spanish	Spanish	16610	11	7092	1.6661	0.1514	3.1407	0.6721
WRIME	Japanese	44114	8	43200	1.1794	0.1474	6.5420	1.5486
XED-en	English	8371	8	17528	1.2792	0.1599	1.4047	0.1662
XED-fi	Finnish	17147	8	14449	1.3065	0.1633	1.3818	0.1405

2 Supplementary figures

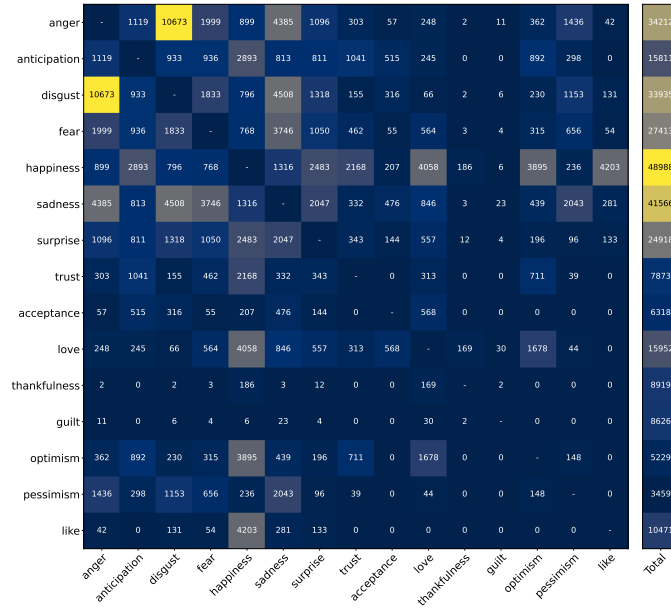


Figure 1: Absolute co-occurrence matrix, excluding GoEmotions and BFRC-PT. The lighter the color the higher the co-occurrence.

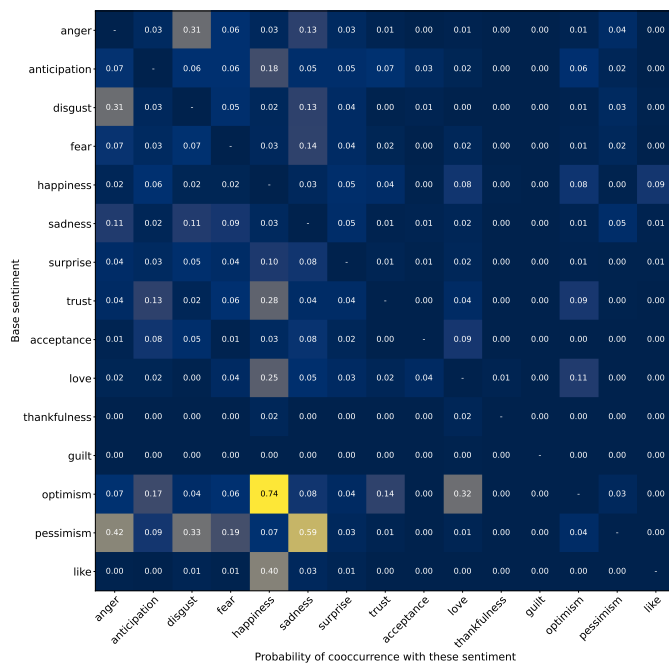


Figure 2: Relative co-occurrence matrix, excluding GoEmotions and BFRC-PT. The lighter the color the higher the co-occurrence.

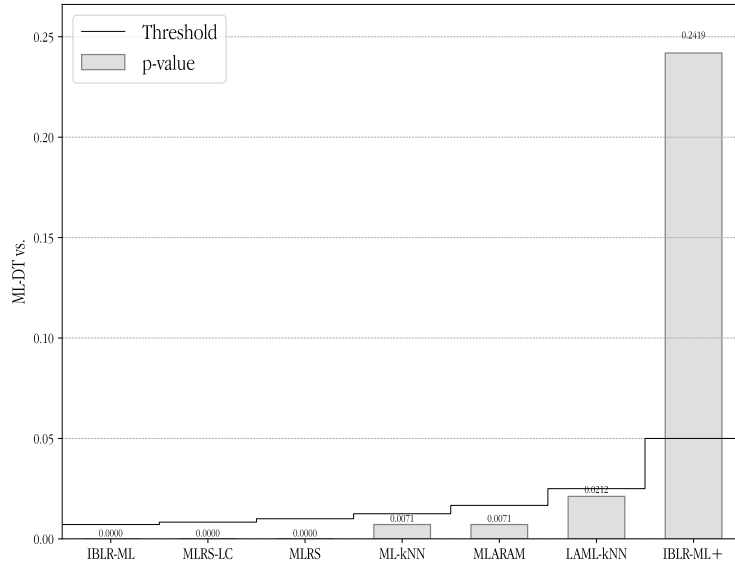


Figure 3: Holm test for algorithm adaptation methods on the accuracy metric

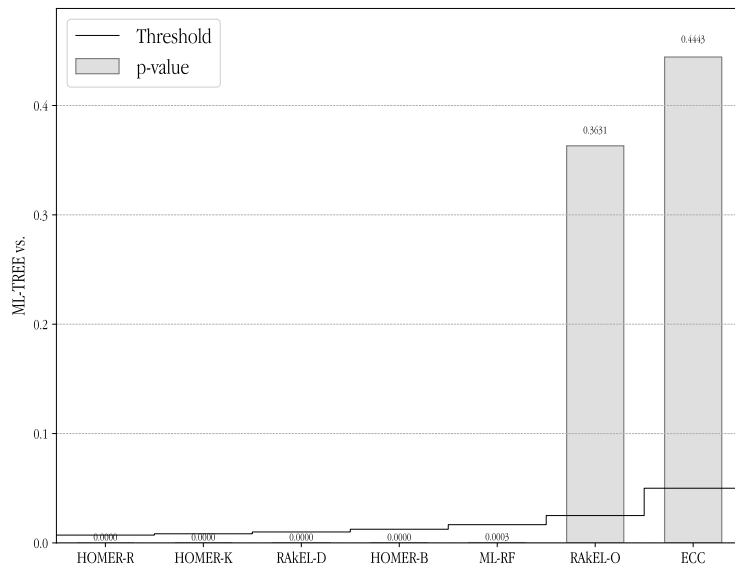


Figure 4: Holm test for ensemble methods on the accuracy metric

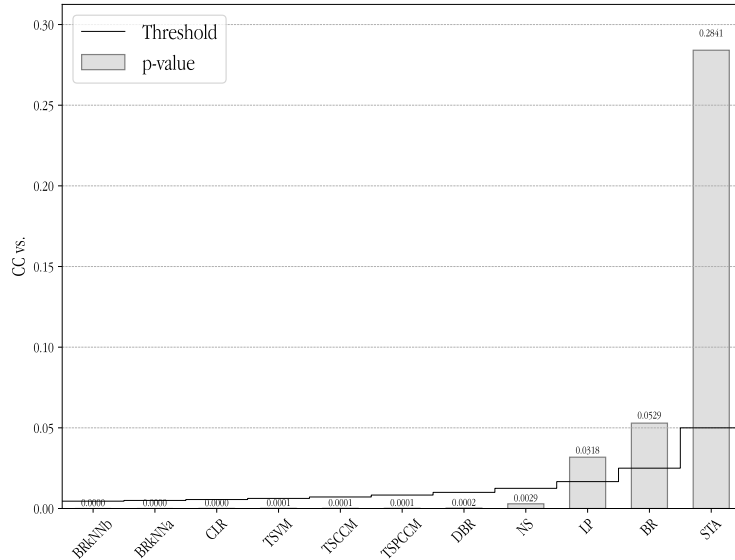


Figure 5: Holm test for binary methods on the accuracy metric

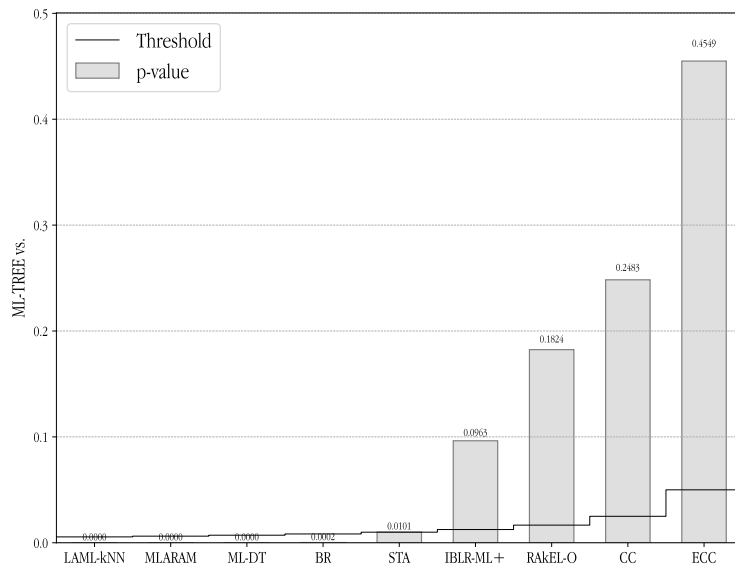


Figure 6: Holm test of the best performing methods on the accuracy metric

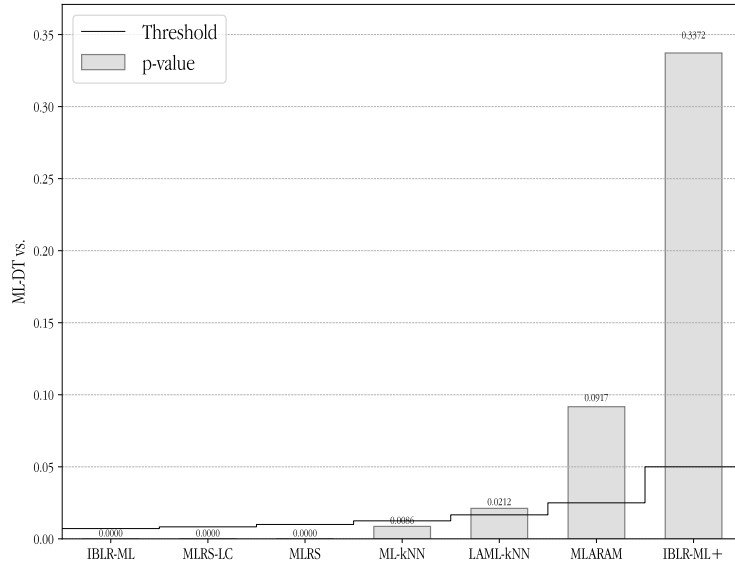


Figure 7: Holm test for algorithm adaptation methods on the instance-based F1-score

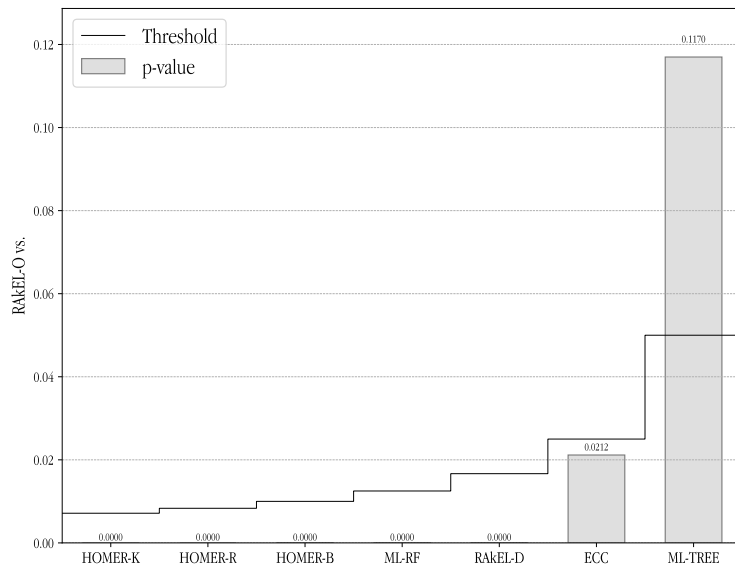


Figure 8: Holm test for ensemble methods on the instance-based F1-score

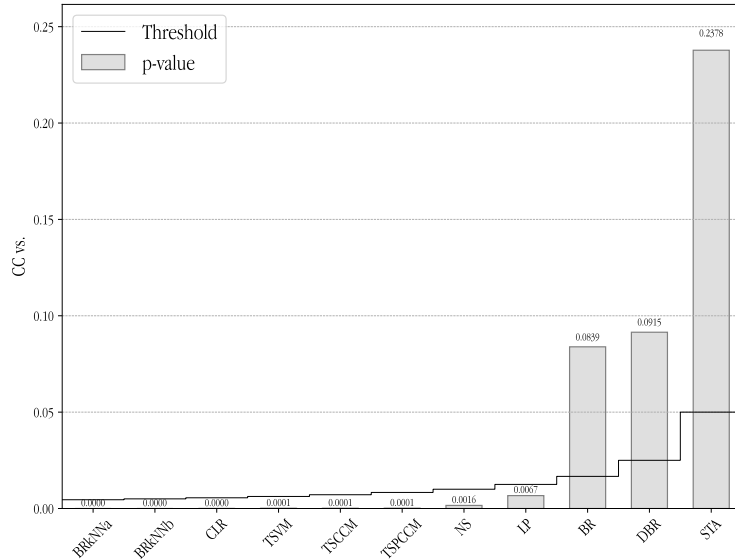


Figure 9: Holm test for binary methods on the instance-based F1-score

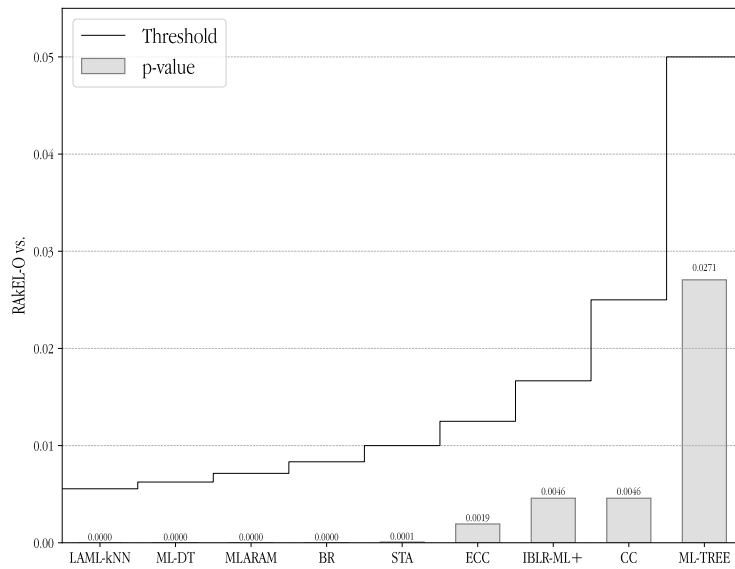


Figure 10: Holm test for the best performing methods on the instance-based F1-score

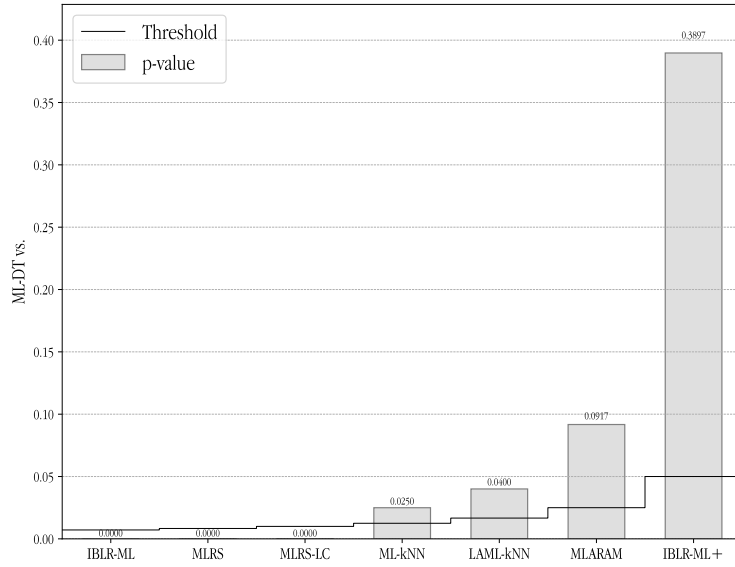


Figure 11: Holm test for algorithm adaptation methods on the F1-macro metric

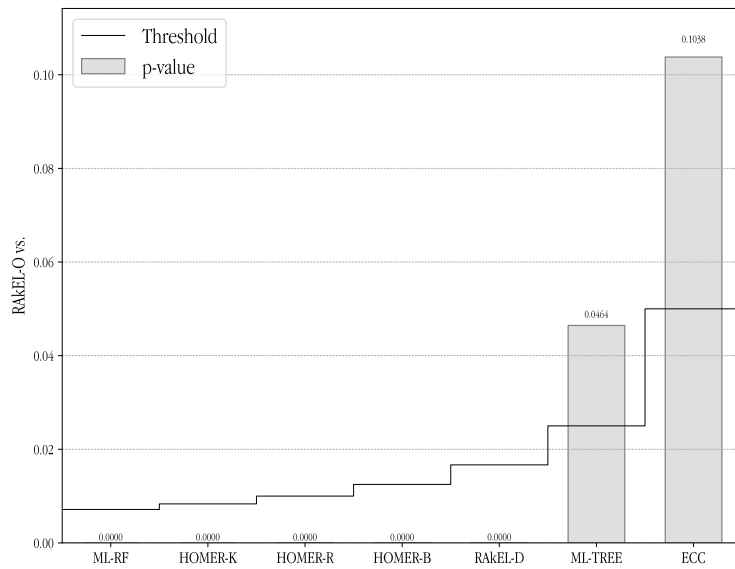


Figure 12: Holm test for ensemble methods on the F1-macro metric

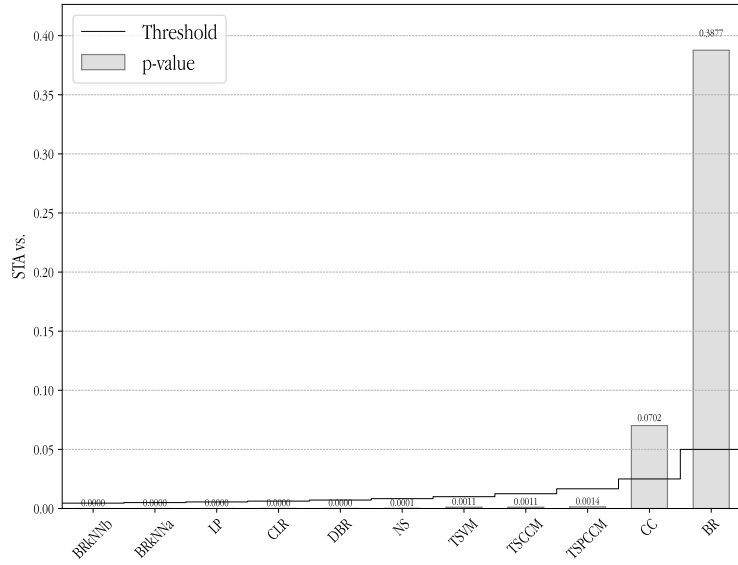


Figure 13: Holm test for binary methods on the F1-macro metric

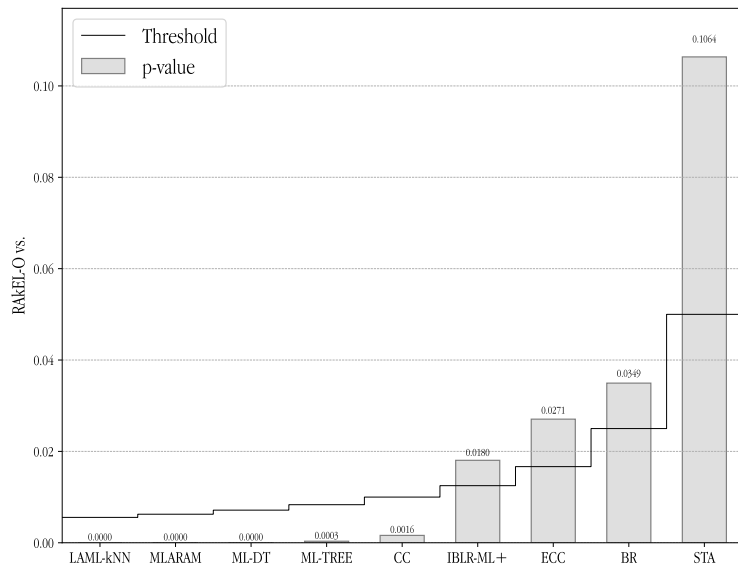


Figure 14: Holm test for the best performing methods on the F1-macro metric

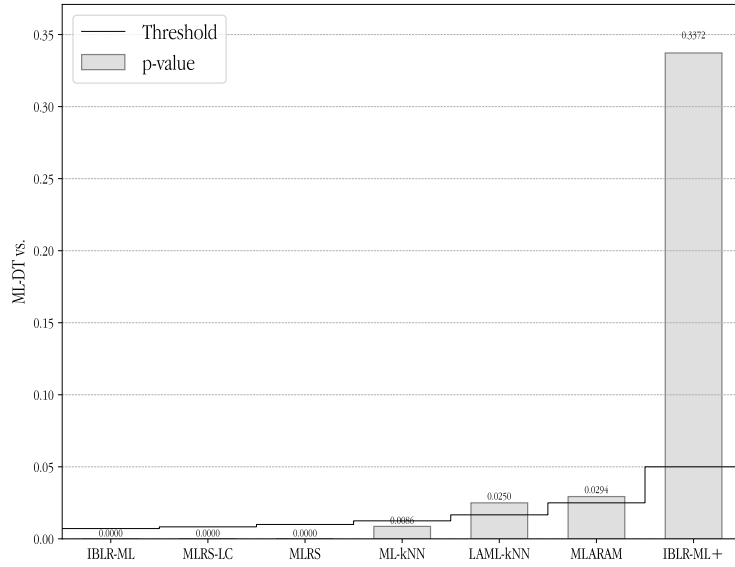


Figure 15: Holm test for algorithm adaptation methods on the F1-micro metric

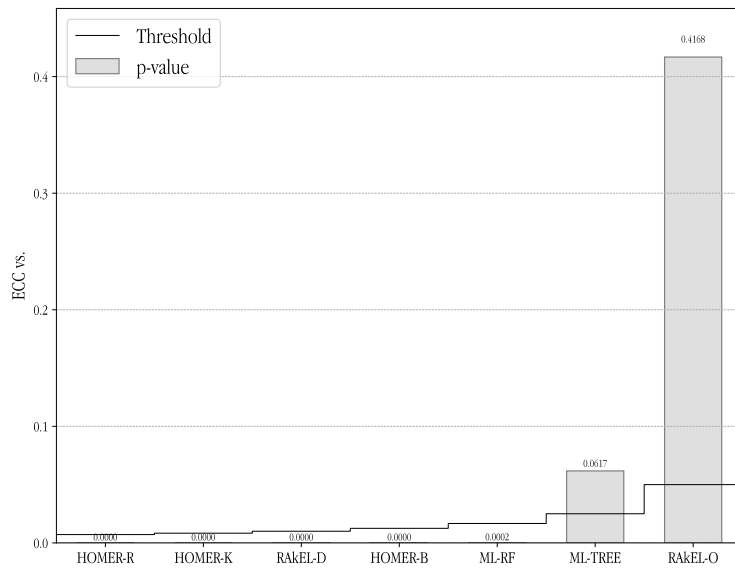


Figure 16: Holm test for ensemble methods on the F1-micro metric

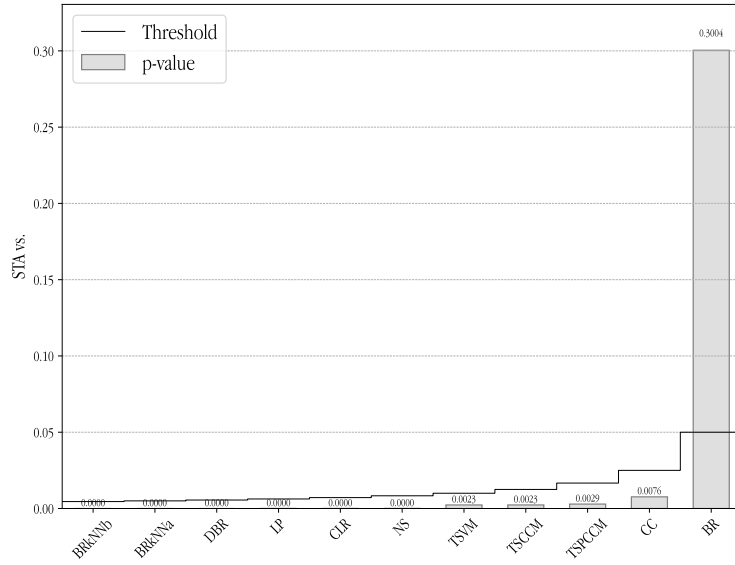


Figure 17: Holm test for binary methods on the F1-micro metric

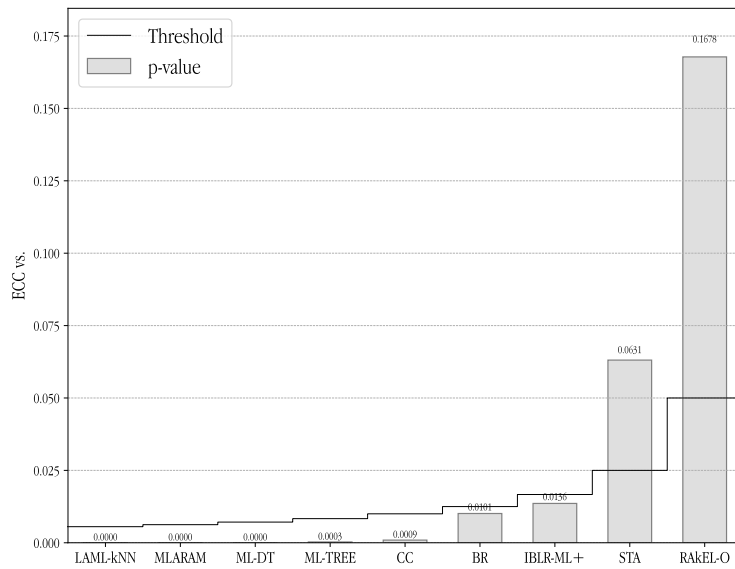


Figure 18: Holm test for the best performing methods on the F1-micro metric

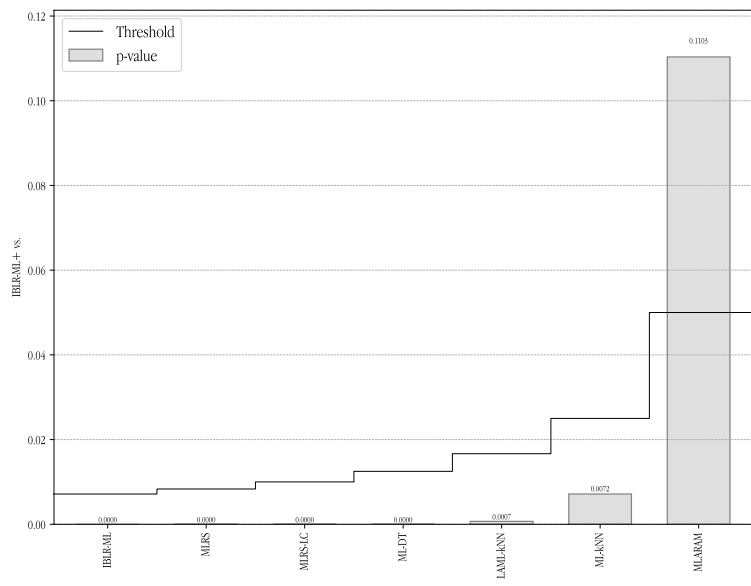


Figure 19: Holm test for algorithm adaptation methods using accuracy and FastText embeddings

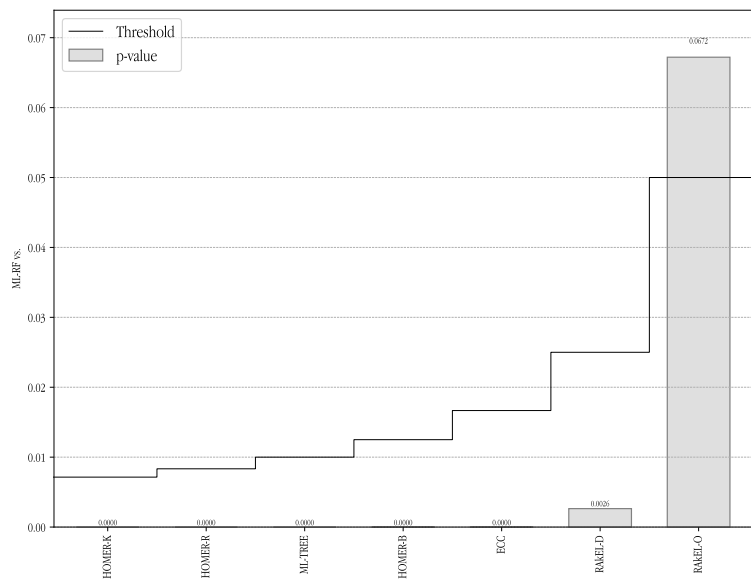


Figure 20: Holm test for ensemble methods using accuracy and FastText embeddings

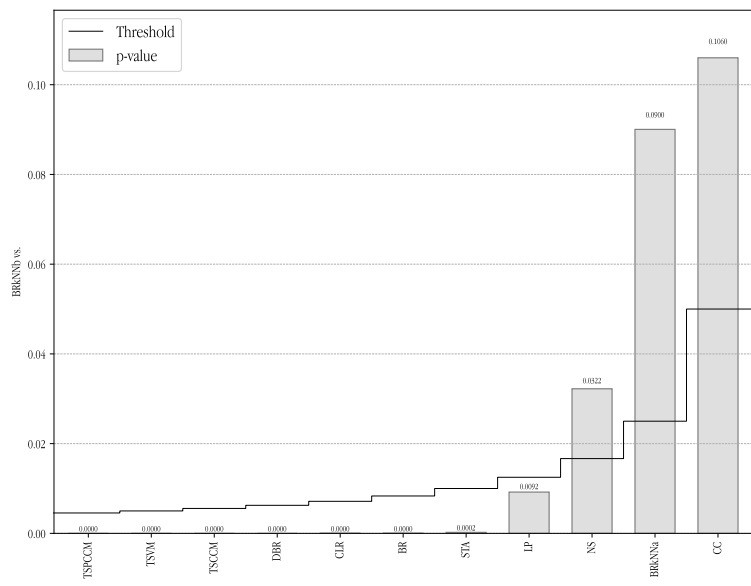


Figure 21: Holm test for binary methods using accuracy and FastText embeddings

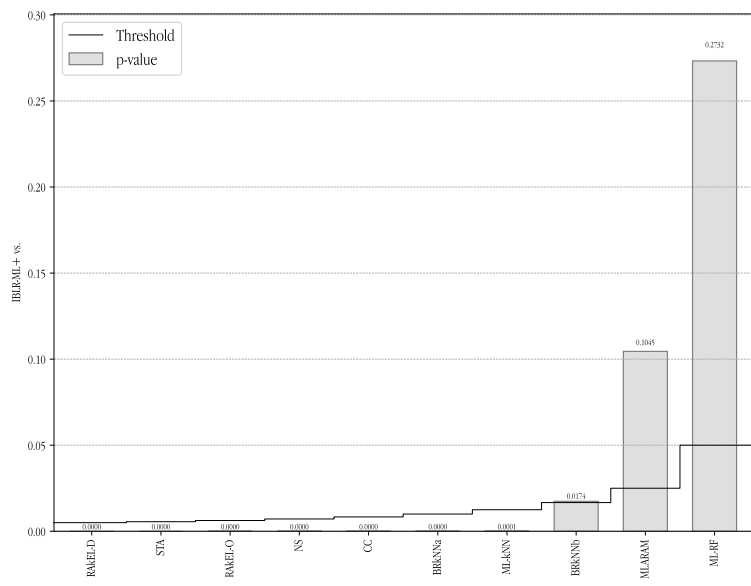


Figure 22: Holm test for the best methods using accuracy and FastText embeddings

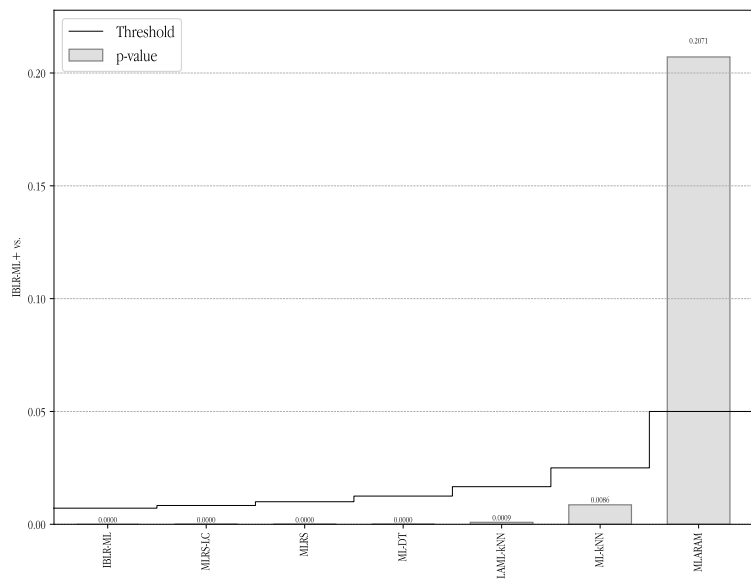


Figure 23: Holm test for algorithm adaptation methods using F1-Score and FastText embeddings

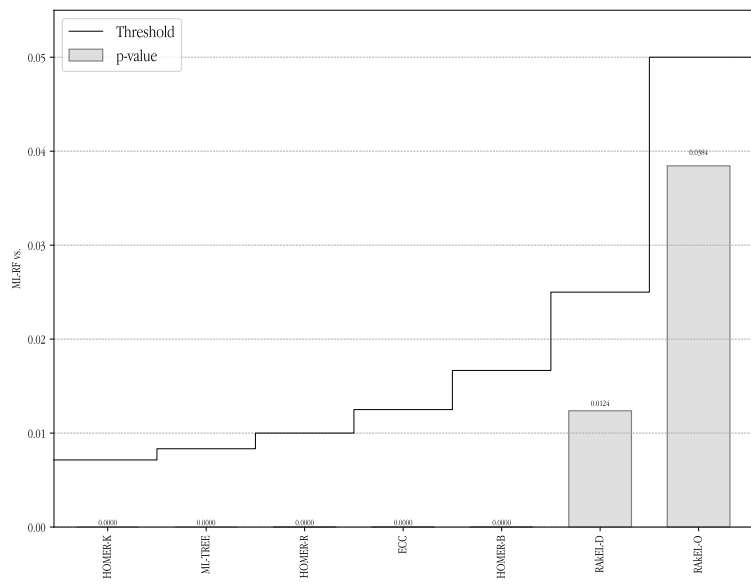


Figure 24: Holm test for ensemble methods using F1-Score and FastText embeddings

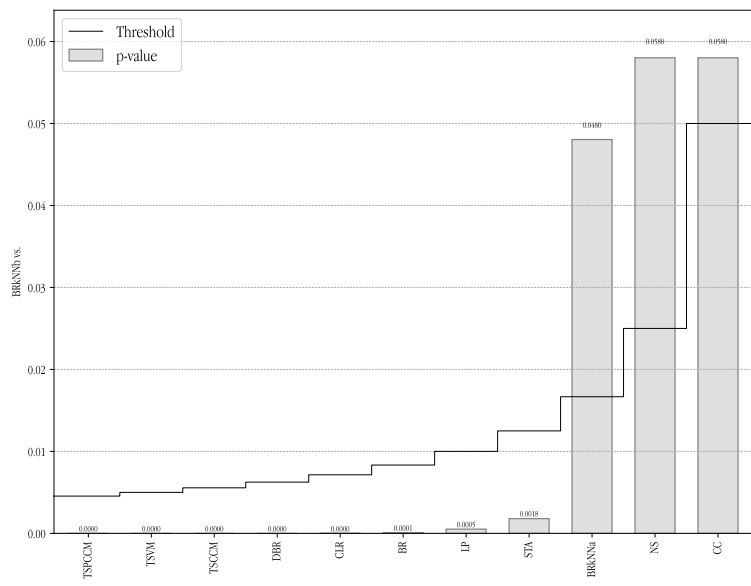


Figure 25: Holm test for binary methods using F1-Score and FastText embeddings

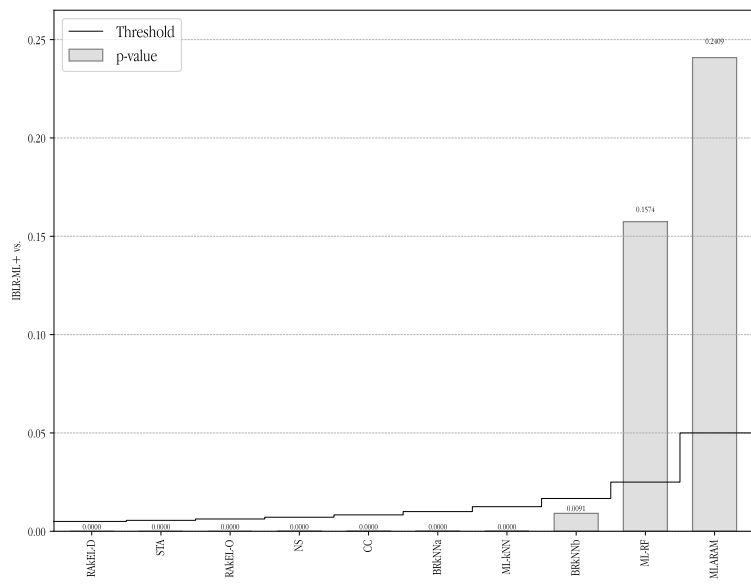


Figure 26: Holm test for the best methods using F1-Score and FastText embeddings

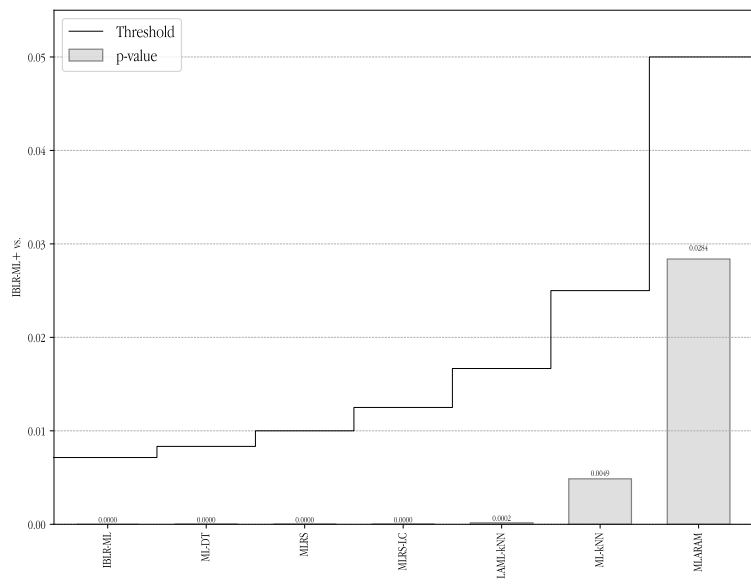


Figure 27: Holm test for algorithm adaptation methods using F1-Macro and FastText embeddings

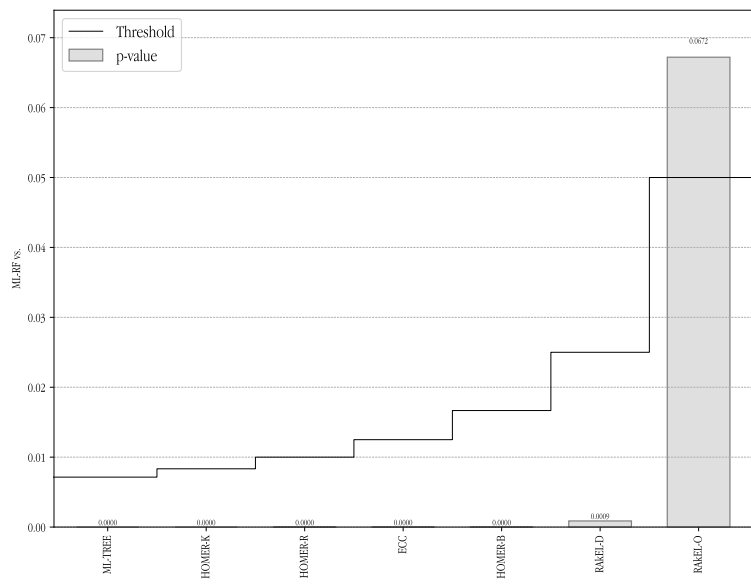


Figure 28: Holm test for ensemble methods using F1-Macro and FastText embeddings

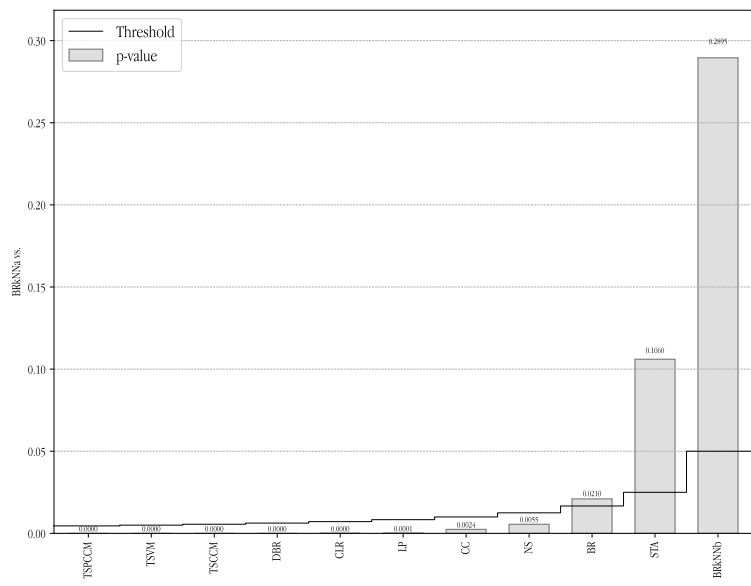


Figure 29: Holm test for binary methods using F1-Macro and FastText embeddings

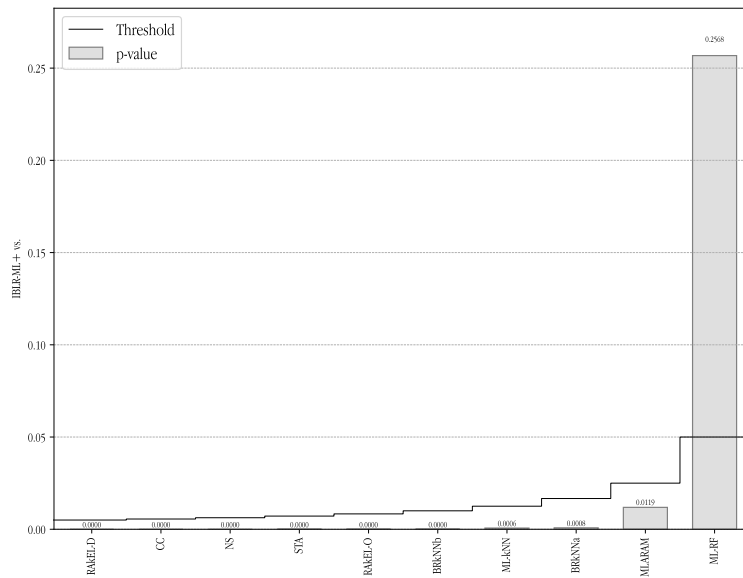


Figure 30: Holm test for the best methods using F1-Macro and FastText embeddings

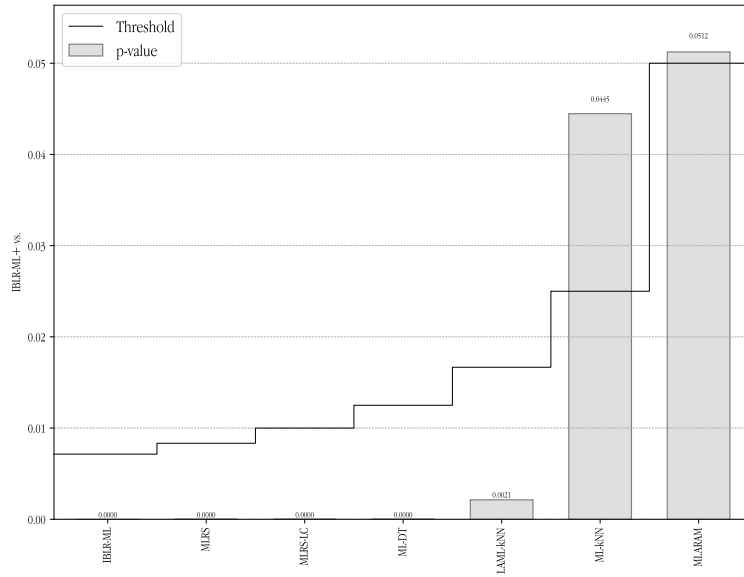


Figure 31: Holm test for algorithm adaptation methods using F1-Micro and FastText embeddings

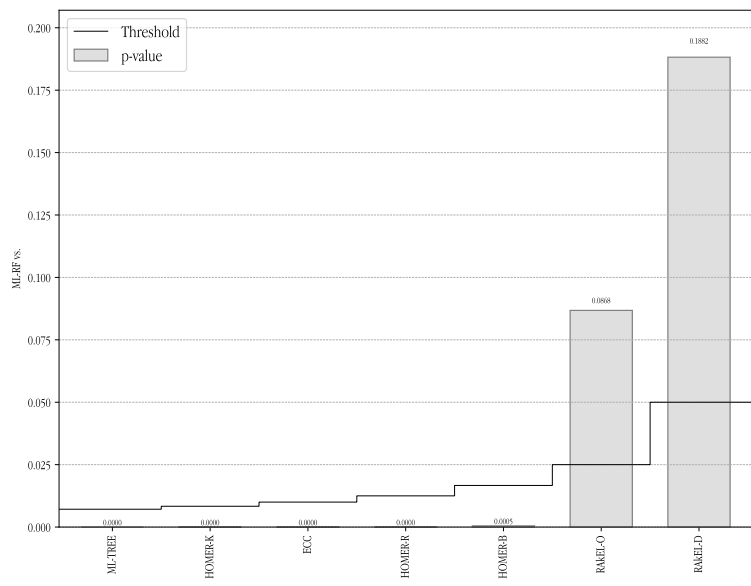


Figure 32: Holm test for ensemble methods using F1-Micro and FastText embeddings

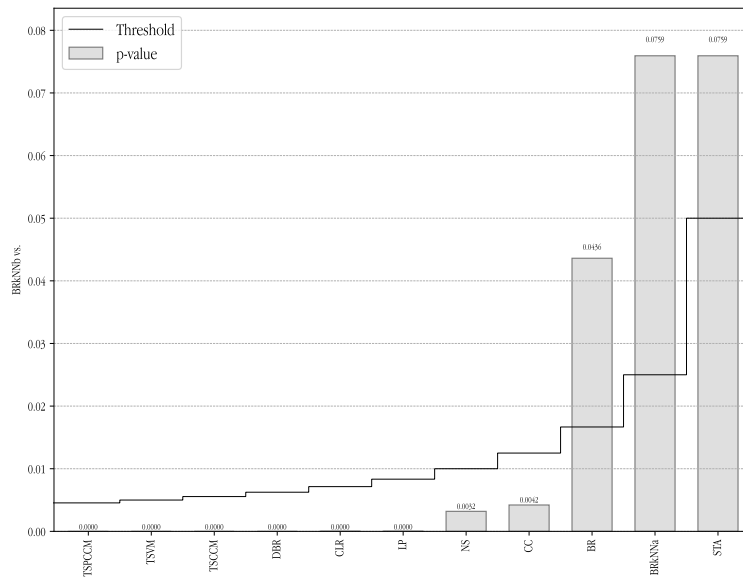


Figure 33: Holm test for binary methods using F1-Micro and FastText embeddings

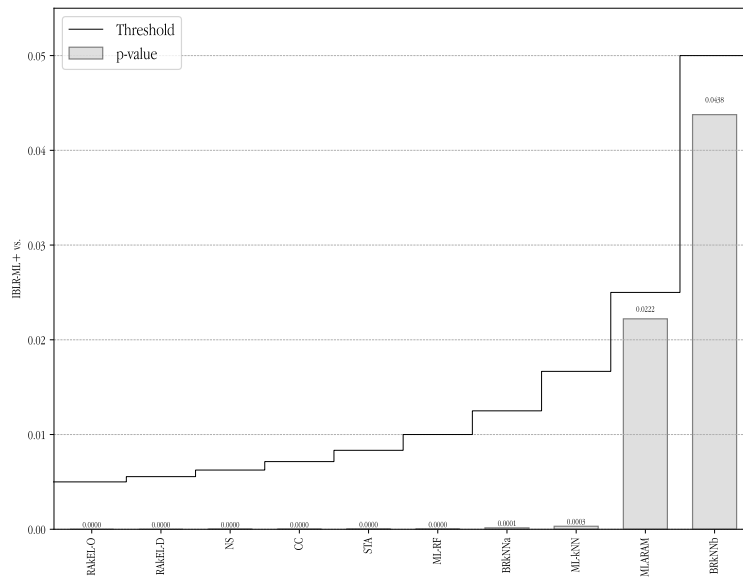


Figure 34: Holm test for the best methods using F1-Micro and FastText embeddings

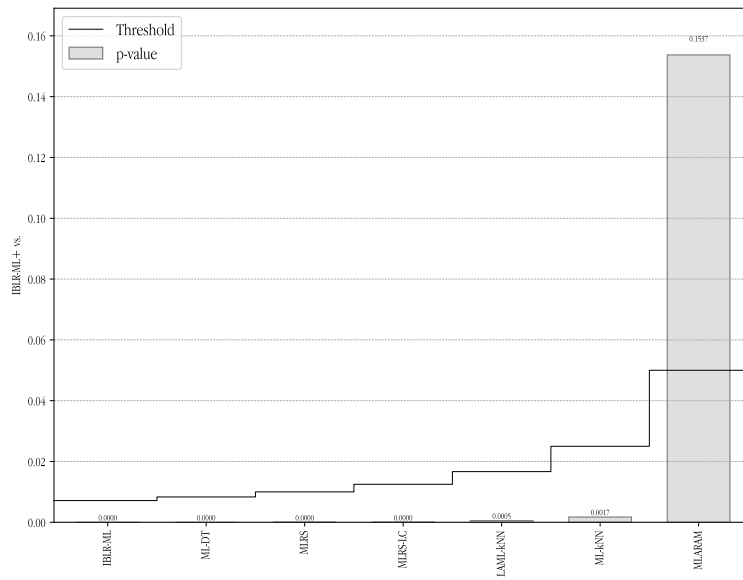


Figure 35: Holm test for algorithm adaptation methods using accuracy and sBERT embeddings

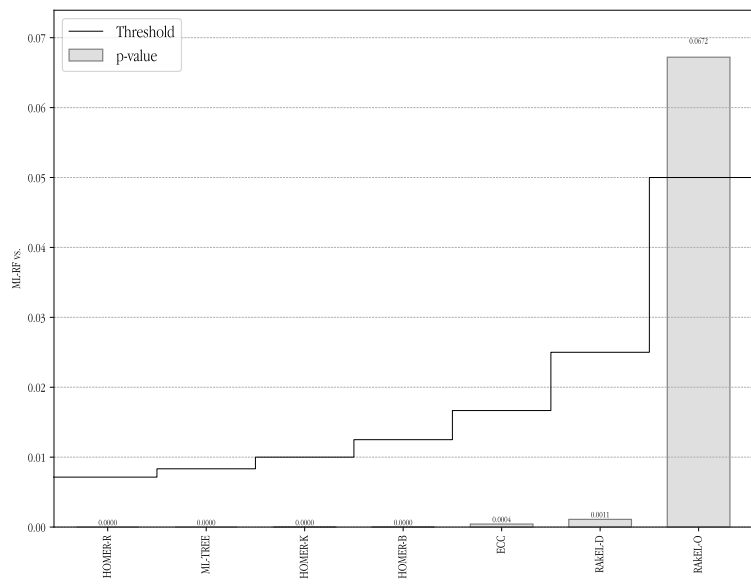


Figure 36: Holm test for ensemble methods using accuracy and sBERT embeddings

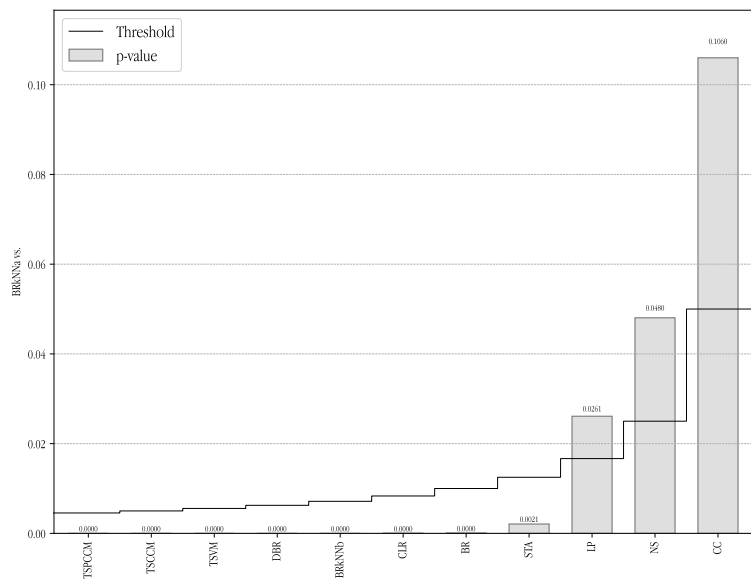


Figure 37: Holm test for binary methods using accuracy and sBERT embeddings

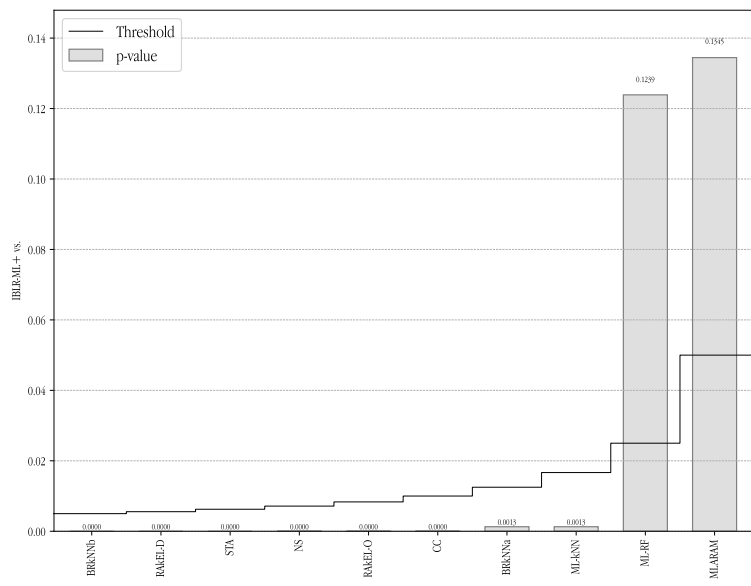


Figure 38: Holm test for the best methods using accuracy and sBERT embeddings

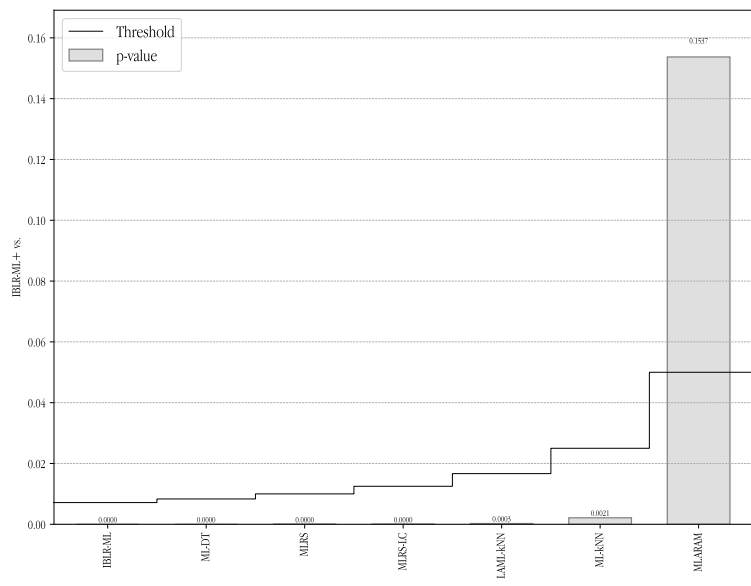


Figure 39: Holm test for algorithm adaptation methods using F1-Score and sBERT embeddings

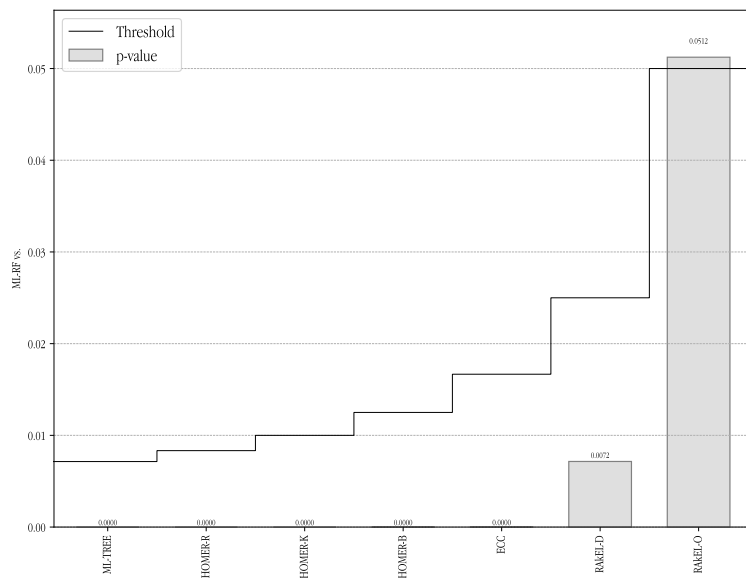


Figure 40: Holm test for ensemble methods using F1-Score and sBERT embeddings

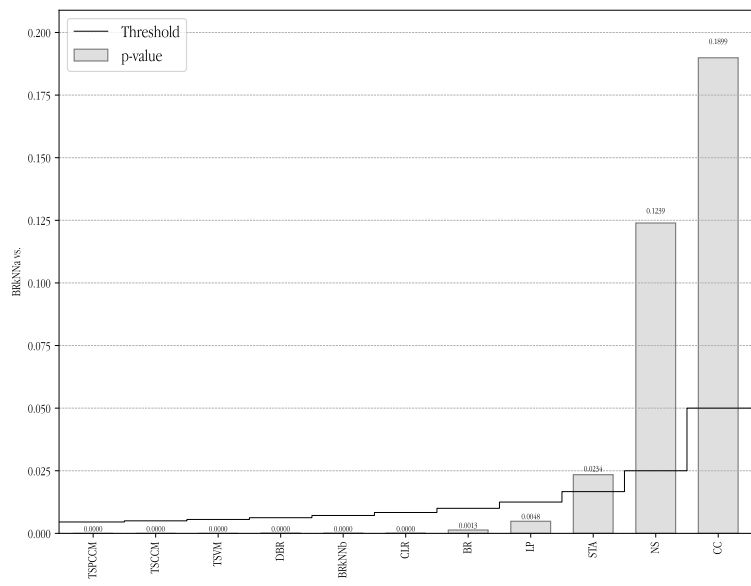


Figure 41: Holm test for binary methods using F1-Score and sBERT embeddings

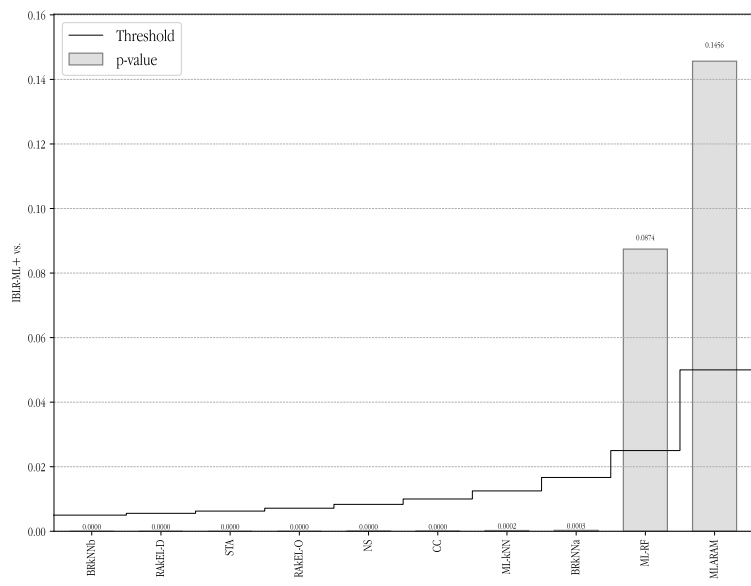


Figure 42: Holm test for the best methods using F1-Score and sBERT embeddings

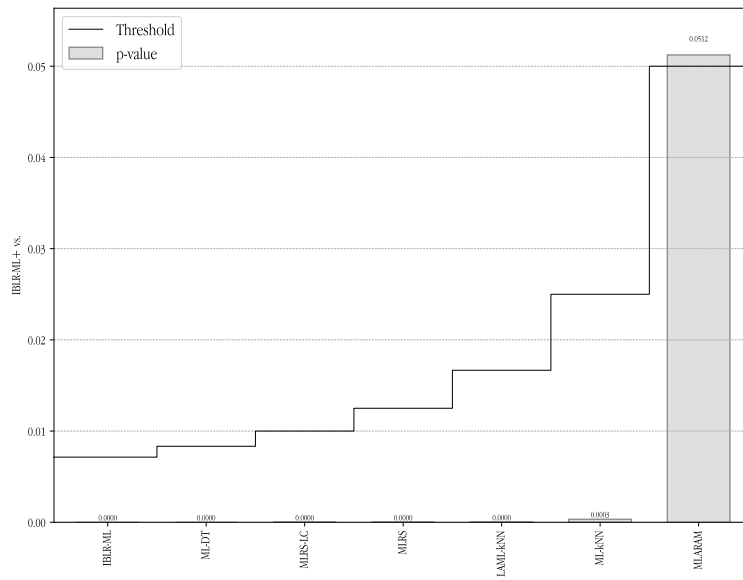


Figure 43: Holm test for algorithm adaptation methods using F1-Macro and sBERT embeddings

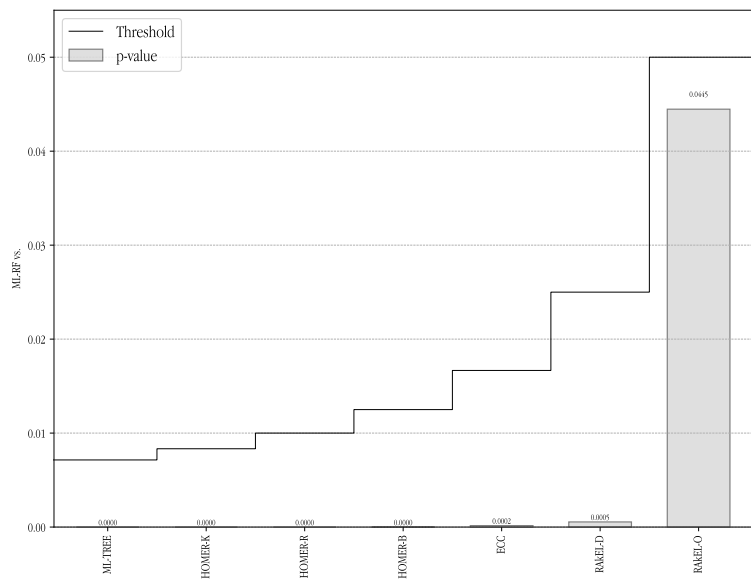


Figure 44: Holm test for ensemble methods using F1-Macro and sBERT embeddings

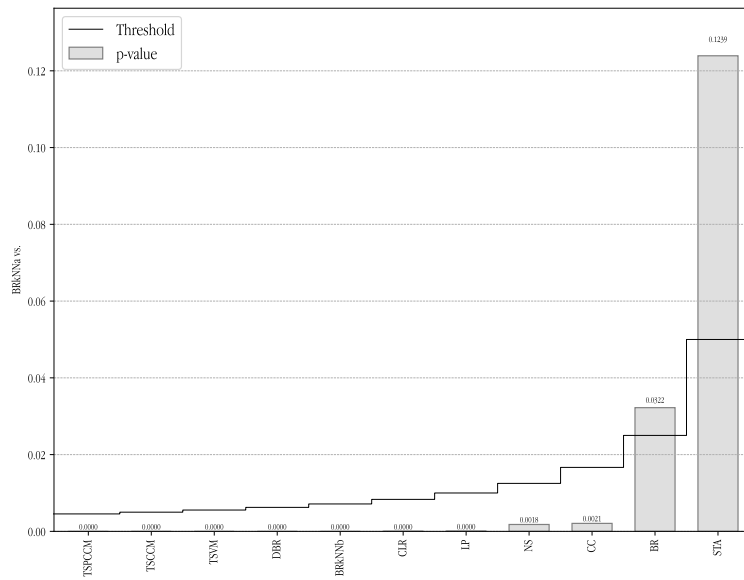


Figure 45: Holm test for binary methods using F1-Macro and sBERT embeddings

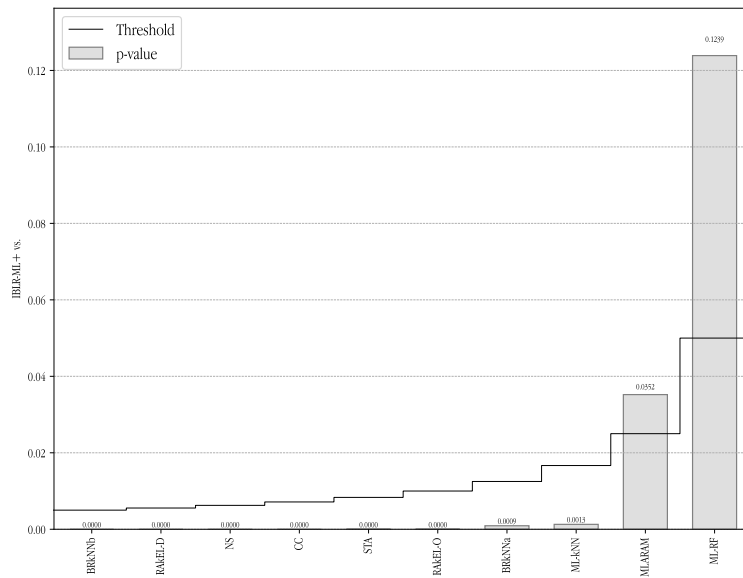


Figure 46: Holm test for the best methods using F1-Macro and sBERT embeddings

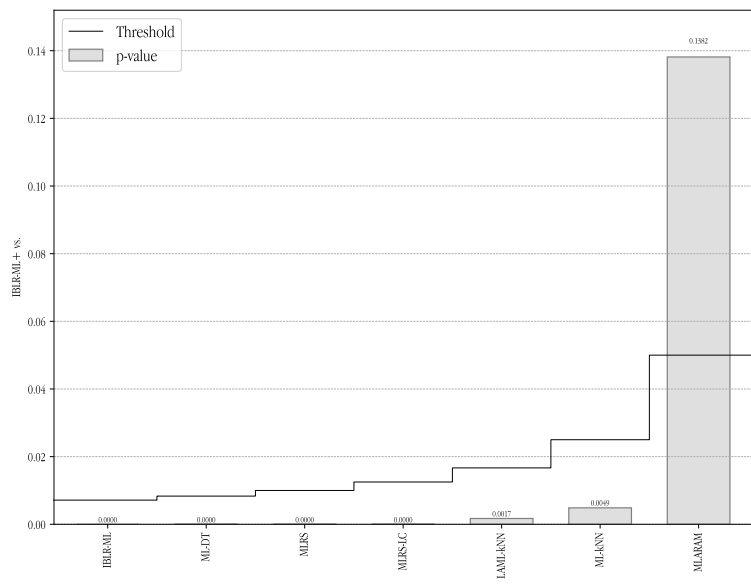


Figure 47: Holm test for algorithm adaptation methods using F1-Micro and sBERT embeddings

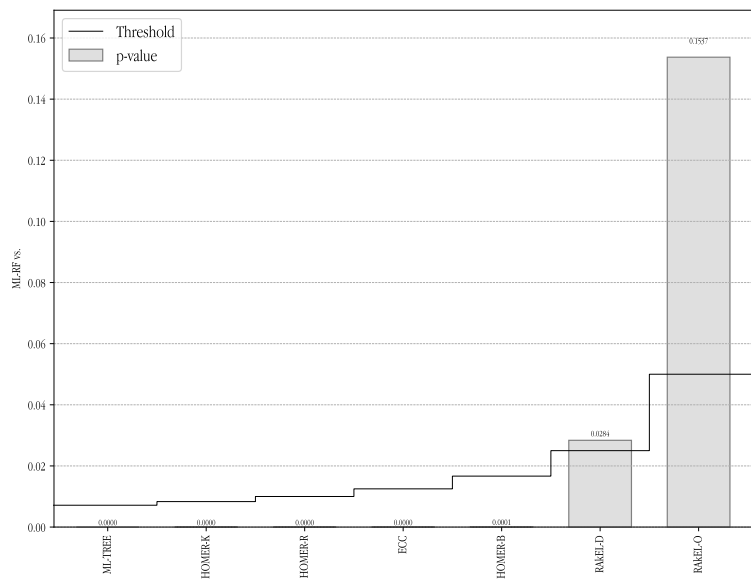


Figure 48: Holm test for ensemble methods using F1-Micro and sBERT embeddings

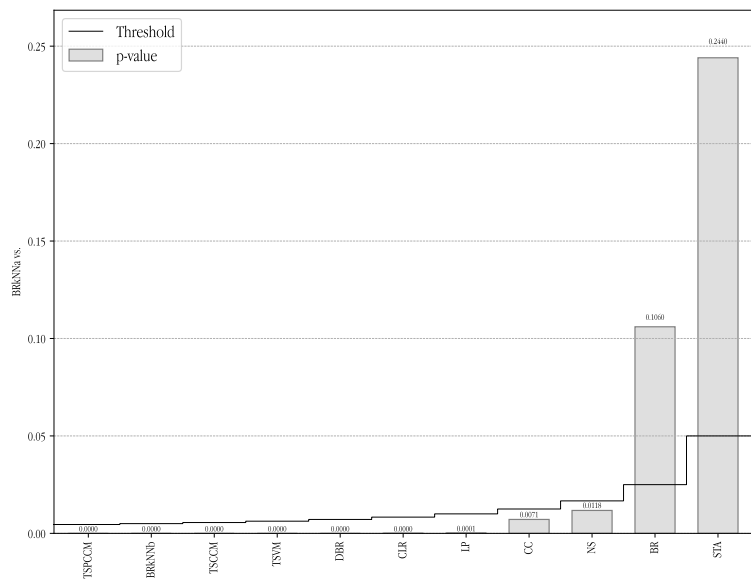


Figure 49: Holm test for binary methods using F1-Micro and sBERT embeddings

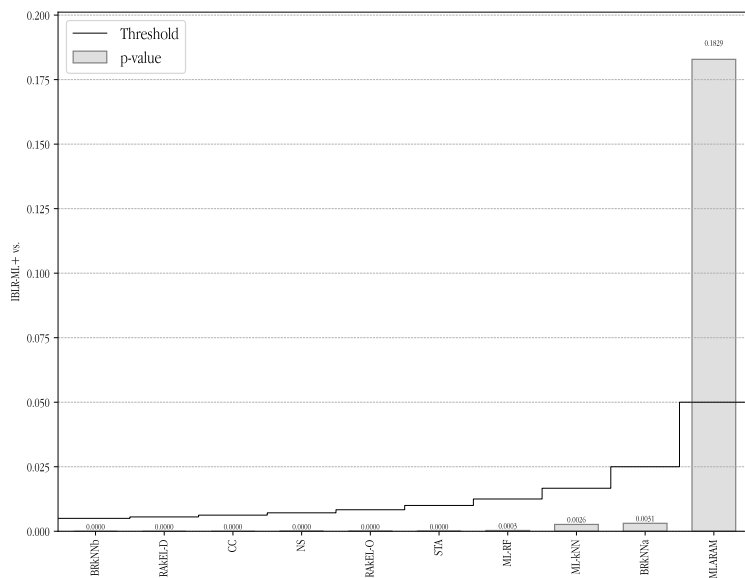


Figure 50: Holm test for the best methods using F1-Micro and sBERT embeddings

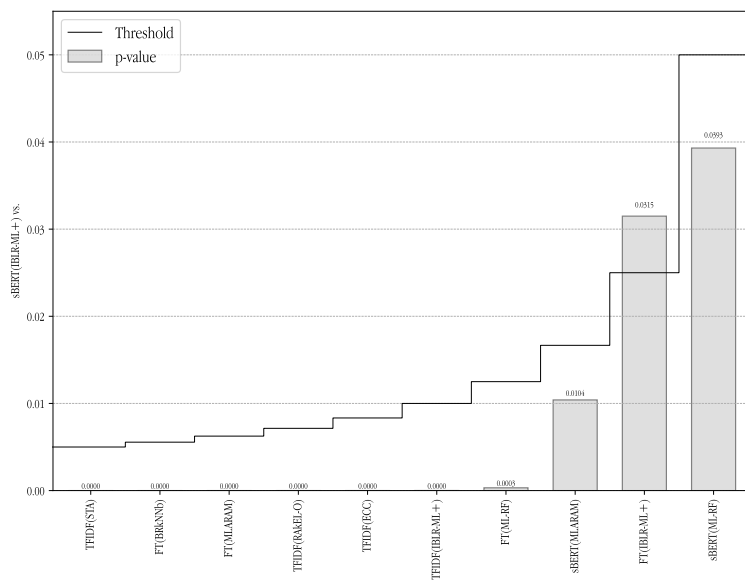


Figure 51: holm test for accuracy on best methods for different embeddings

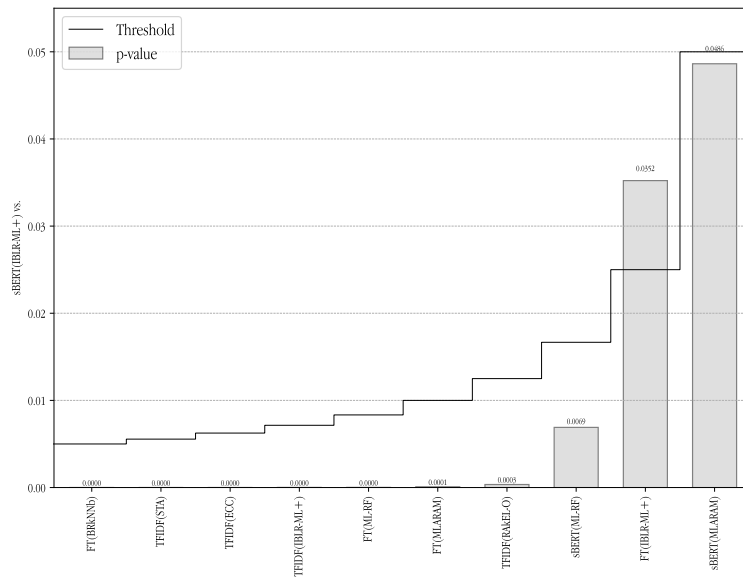


Figure 52: holm test for F1-Score on best methods for different embeddings

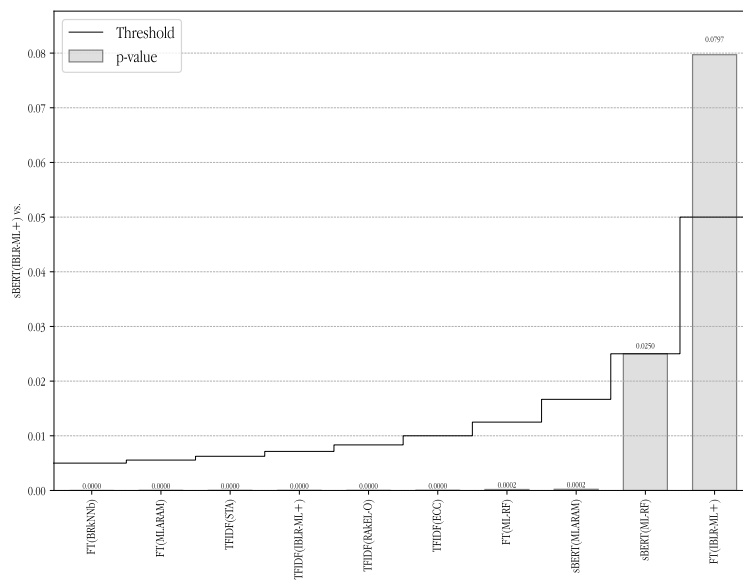


Figure 53: holm test for F1-Macro on best methods for different embeddings

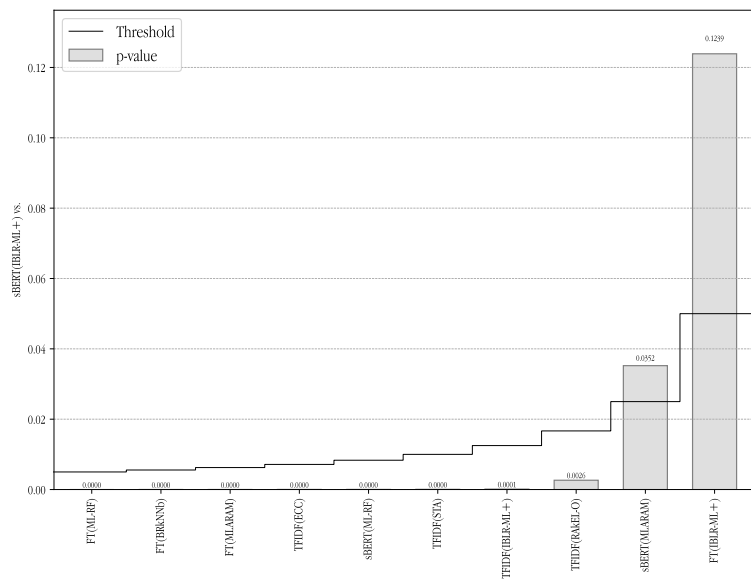


Figure 54: holm test for F1-Micro on best methods for different embeddings

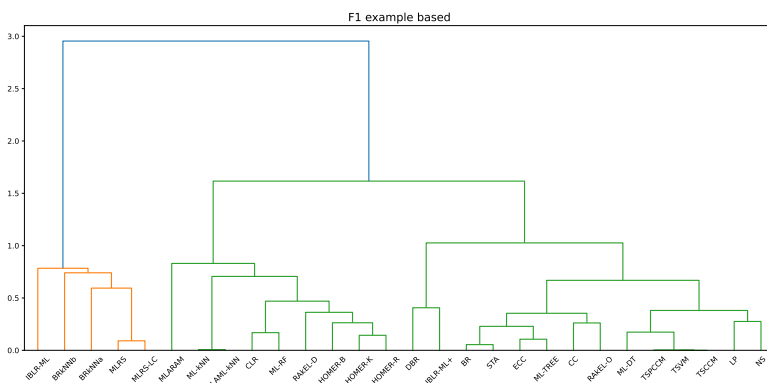


Figure 55: Dendrogram of the example-based F1 score

3 Detailed results

Table 3: Results on accuracy for each method using TF-IDF

Method	semEval2018 spanish	XED-fi	GoEmotions	MLEC-AML English	CancerEmo	semEval2018 english	EmoThreat	ExaAEC	semEval2007	cedr	WRIME	NLPCC2018	XED-en	BFRC-PT	semEval2018 arab	MLEC-AML Indo	REDv2
ML-kNN	0.184388	0.098093	0.111086	0.245227	0.296056	0.287932	0.210386	0.285121	0.409025	0.261887	0.172968	0.345088	0.116860	0.453726	0.240616	0.405859	0.156327
BR	0.336018	0.209354	0.214878	0.332340	0.328737	0.408236	0.650398	0.299146	0.327524	0.460717	0.335686	0.384622	0.209986	0.441713	0.336726	0.477232	0.344265
CC	0.354804	0.210179	0.290177	0.374888	0.388838	0.417576	0.671470	0.355307	0.482993	0.505138	0.192776	0.441132	0.202754	0.439754	0.354031	0.530729	0.264406
LAML-kNN	0.184388	0.102127	0.111719	0.245227	0.296056	0.287932	0.210386	0.285121	0.409025	0.261887	0.176627	0.345088	0.117650	0.453726	0.240616	0.405859	0.156846
RAkEL-O	0.325076	0.246745	0.243461	0.363222	0.364443	0.403446	0.661125	0.348223	0.452925	0.521238	0.345255	0.428191	0.246604	0.493180	0.364194	0.499315	0.308054
RAkEL-D	0.215807	0.159480	0.137152	0.315467	0.136043	0.215672	0.389256	0.143145	0.240981	0.391878	0.139802	0.324983	0.160523	0.464664	0.196194	0.284465	0.213691
LP	0.218561	0.218723	0.241373	0.344030	0.363130	0.302029	0.661153	0.330536	0.454733	0.511503	0.332420	0.421381	0.200674	0.432238	0.240234	0.519146	0.246420
CLR	0.272052	0.133577	0.144931	0.249225	0.248107	0.365877	0.610584	0.222002	0.267468	0.382958	0.235064	0.317813	0.125348	0.442454	0.274002	0.416993	0.187638
HOMER-B	0.219631	0.135247	0.089835	0.259565	0.192390	0.324573	0.360665	0.246168	0.266507	0.277731	0.165353	0.310093	0.130031	0.463278	0.250609	0.316548	0.178092
HOMER-K	0.223613	0.120804	0.093909	0.259565	0.162038	0.330115	0.380272	0.174234	0.248929	0.286712	0.191905	0.306746	0.106253	0.410389	0.182623	0.239359	0.179005
HOMER-R	0.189036	0.119124	0.063473	0.183442	0.176634	0.273884	0.318964	0.148582	0.239095	0.311947	0.139851	0.262873	0.109802	0.427802	0.219272	0.236497	0.141420
ML-DT	0.323552	0.145128	0.196788	0.331933	0.349121	0.410119	0.653009	0.303181	0.296066	0.441237	0.308787	0.397200	0.179032	0.466917	0.320119	0.494343	0.229097
ML-RF	0.277042	0.083519	0.154413	0.295041	0.303894	0.398067	0.649044	0.239851	0.262951	0.384439	0.242366	0.377868	0.088615	0.491184	0.292212	0.497871	0.107224
DBR	0.333166	0.134001	0.035935	0.332678	0.325710	0.409319	0.649695	0.300954	0.401266	0.468274	0.020511	0.406072	0.140368	0.439245	0.349887	0.466005	0.021444
STA	0.346819	0.205020	0.211567	0.356745	0.349044	0.418727	0.661220	0.322325	0.326015	0.493451	0.336203	0.417911	0.209947	0.445439	0.343800	0.502590	0.345809
NS	0.338689	0.122827	0.116653	0.360605	0.359458	0.406335	0.665972	0.327060	0.400336	0.493370	0.259472	0.432908	0.153244	0.436855	0.233320	0.501736	0.216702
ECC	0.352108	0.237477	0.278196	0.348764	0.360676	0.432932	0.666681	0.328270	0.434257	0.526834	0.388313	0.423788	0.252136	0.457982	0.343232	0.523783	0.385724
IBLR-ML	0.000000	0.000000	0.001901	0.000038	0.001948	0.001836	0.000211	0.000000	0.000000	0.000000	0.005029	0.001097	0.000000	0.466621	0.000160	0.304367	0.000000
IBLR-ML+	0.359341	0.011683	0.018537	0.395179	0.409888	0.439883	0.677603	0.374394	0.546524	0.506486	0.202415	0.422978	0.016926	0.494431	0.228003	0.529903	0.129534
TSVM	0.327190	0.173552	0.193066	0.315359	0.313684	0.403403	0.642328	0.278987	0.306834	0.434570	0.321148	0.370739	0.181990	0.439281	0.326722	0.456391	0.321061
TSCCM	0.327190	0.173552	0.193066	0.315359	0.313684	0.403403	0.642328	0.278987	0.306834	0.434570	0.321148	0.370739	0.181990	0.439281	0.326722	0.456391	0.321061
TSPCCM	0.327190	0.173552	0.193066	0.315359	0.313684	0.403403	0.642328	0.278987	0.306834	0.434570	0.321148	0.370739	0.181990	0.439281	0.328560	0.456391	0.321061
ML-TREE	0.338860	0.256905	0.248937	0.375258	0.355988	0.428902	0.659586	0.335872	0.378740	0.525635	0.381102	0.438464	0.251650	0.489640	0.373776	0.517947	0.394835
MLRS	0.103380	0.114100	0.160895	0.170037	0.170633	0.188869	0.069698	0.203503	0.196764	0.076661	0.130332	0.324403	0.125725	0.396974	0.113578	0.377847	0.095779
MLRS-LC	0.113433	0.101785	0.163482	0.140873	0.131856	0.169507	0.091551	0.225132	0.191599	0.076482	0.143350	0.324776	0.147410	0.425739	0.094689	0.374163	0.089099
MLARAM	0.204236	0.280196	0.256231	0.174672	0.195312	0.271754	0.154349	0.069307	0.276907	0.253679	0.368963	0.248030	0.226542	0.267781	0.303021	0.156783	0.389399
BRkNa	0.029756	0.041313	0.186629	0.255179	0.330386	0.046705	0.069078	0.035586	0.113480	0.128570	0.105081	0.047034	0.044843	0.458422	0.126582	0.453308	0.033032
BRkNNb	0.031919	0.132563	0.261888	0.113564	0.039207	0.073903	0.408256	0.188594	0.100909	0.306109	0.038930	0.234726	0.137687	0.400442	0.038039	0.053596	0.137272

Table 4: Results on F1-score for each method

Method	semEval2018 spanish	XED-f	GoEmotions	MLEC-AML English	CancerEmo	semEval2018 english	EmoThreat	ExaAEC	semEval2007	cedr	WRIME	NLPCC2018	XED-en	BFRC-PT	semEval2018 arab	MLEC-AML Indo	REDv2
ML-kNN	0.251889	0.109656	0.115867	0.285896	0.322588	0.392522	0.245401	0.352646	0.466002	0.277151	0.188960	0.393185	0.132456	0.634531	0.336823	0.454006	0.173434
BR	0.437788	0.253861	0.246483	0.406641	0.380641	0.556089	0.710572	0.363414	0.357498	0.493854	0.390496	0.439385	0.258893	0.626464	0.469282	0.526167	0.392748
CC	0.454402	0.305345	0.356683	0.446140	0.436042	0.548585	0.728520	0.416934	0.513972	0.523709	0.299605	0.487956	0.302501	0.625522	0.474261	0.574001	0.378046
LAML-kNN	0.251889	0.114683	0.116822	0.285896	0.322588	0.392522	0.245401	0.352646	0.466002	0.277151	0.193020	0.393185	0.134169	0.634531	0.336823	0.454006	0.173860
RAkEL-O	0.475101	0.344003	0.325394	0.500987	0.499727	0.570869	0.769016	0.482433	0.528801	0.607166	0.477082	0.530183	0.360543	0.664034	0.524105	0.613197	0.429052
RAkEL-D	0.325742	0.271139	0.191067	0.426333	0.235610	0.321125	0.537802	0.242449	0.331105	0.494552	0.242123	0.437792	0.269225	0.639379	0.301825	0.391452	0.292299
LP	0.278899	0.252854	0.253697	0.400056	0.392391	0.389648	0.710180	0.380756	0.479871	0.516197	0.358356	0.453947	0.230643	0.624886	0.325582	0.547808	0.261410
CLR	0.335767	0.156096	0.157784	0.294149	0.274956	0.485509	0.654163	0.259662	0.295257	0.407095	0.262545	0.353578	0.146894	0.639609	0.369819	0.450035	0.205900
HOMER-B	0.336546	0.199857	0.128942	0.320583	0.269819	0.423655	0.504449	0.372501	0.366669	0.338460	0.236838	0.364532	0.191182	0.648865	0.341284	0.415817	0.252722
HOMER-K	0.297745	0.168556	0.115318	0.320583	0.201753	0.440306	0.502827	0.200325	0.287768	0.328979	0.205921	0.367116	0.138637	0.599596	0.273276	0.317131	0.222107
HOMER-R	0.279804	0.176005	0.094514	0.274090	0.248385	0.412114	0.457685	0.226709	0.323090	0.391946	0.199557	0.345365	0.160994	0.612924	0.342742	0.333341	0.202362
ML-DT	0.398220	0.164587	0.208573	0.384303	0.376941	0.518177	0.700486	0.344567	0.308833	0.446035	0.332553	0.426133	0.201159	0.650111	0.419367	0.520658	0.243487
ML-RF	0.331577	0.092053	0.163982	0.332481	0.320782	0.494849	0.687984	0.262927	0.276283	0.387667	0.254146	0.397646	0.096175	0.662988	0.385449	0.516884	0.111413
DBR	0.495809	0.173468	0.054026	0.469197	0.454841	0.566611	0.734721	0.440305	0.549190	0.583251	0.022360	0.537311	0.206569	0.623974	0.498914	0.592020	0.023206
STA	0.449770	0.249141	0.243921	0.427183	0.397221	0.564238	0.719624	0.383769	0.356802	0.514404	0.390915	0.466556	0.258281	0.630582	0.473844	0.544516	0.394869
NS	0.432635	0.150171	0.143345	0.425095	0.402250	0.535286	0.720342	0.384605	0.433572	0.501619	0.310171	0.472258	0.192362	0.624853	0.352961	0.542250	0.243552
ECC	0.428244	0.299645	0.319220	0.398686	0.388839	0.552520	0.712917	0.369530	0.460892	0.536082	0.473128	0.455811	0.324418	0.643770	0.491156	0.554586	0.458884
IBLR-ML	0.000000	0.000000	0.001935	0.000038	0.001975	0.002345	0.000281	0.000000	0.000000	0.000000	0.005055	0.001097	0.000000	0.637692	0.000229	0.316597	0.000000
IBLR-ML+	0.479894	0.013246	0.019692	0.476838	0.467695	0.579430	0.770290	0.488774	0.631697	0.556823	0.214677	0.508632	0.018718	0.675672	0.305117	0.594935	0.138938
TSVM	0.414566	0.203207	0.215896	0.377221	0.353721	0.543606	0.695216	0.331512	0.334369	0.456916	0.363906	0.413369	0.215952	0.623970	0.447911	0.493755	0.355190
TSCCM	0.414566	0.203207	0.215896	0.377221	0.353721	0.543606	0.695216	0.331512	0.334369	0.456916	0.363906	0.413369	0.215952	0.623970	0.447911	0.493755	0.355190
TSPCCM	0.414566	0.203207	0.215896	0.377221	0.353721	0.543606	0.695216	0.331512	0.334369	0.456916	0.363906	0.413369	0.215952	0.623970	0.447911	0.493755	0.355190
ML-TREE	0.449459	0.310456	0.287809	0.448627	0.404251	0.559177	0.723161	0.400438	0.418284	0.536191	0.430817	0.482761	0.305496	0.664643	0.500187	0.563098	0.435295
MLRS	0.131512	0.132410	0.161225	0.197116	0.177197	0.253018	0.078916	0.222192	0.212366	0.077792	0.141080	0.343301	0.145466	0.573063	0.145360	0.393395	0.102708
MLRS-LC	0.144642	0.116018	0.163781	0.162855	0.136839	0.228520	0.106143	0.259468	0.211669	0.077613	0.154641	0.343437	0.170336	0.604527	0.125841	0.389645	0.094119
MLARAM	0.337511	0.358425	0.257560	0.291755	0.312414	0.449656	0.245472	0.103311	0.360187	0.349966	0.466910	0.373821	0.343828	0.402474	0.424014	0.253117	0.449202
BRkNa	0.036231	0.045296	0.187311	0.300644	0.345108	0.063244	0.078292	0.038074	0.119848	0.130533	0.112065	0.049295	0.048882	0.632214	0.169636	0.473500	0.034425
BRkNNb	0.049050	0.158110	0.262227	0.156190	0.044343	0.117465	0.413124	0.210737	0.117008	0.308855	0.042903	0.254983	0.165842	0.572884	0.061685	0.057082	0.146539

Table 5: Results on F1-macro for each method

Method	semEval2018 spanish	XED-fi	GoEmotions	MLEC-AML English	CancerEmo	semEval2018 english	EmoThreat	ExaAEC	semEval2007	cedr	WRIME	NLPCC2018	XED-en	BFRC-PT	semEval2018 arab	MLEC-AML Indo	REDv2
ML-kNN	0.234570	0.147906	0.070996	0.232560	0.179690	0.275761	0.297218	0.234582	0.361640	0.281086	0.162612	0.235320	0.174768	0.511393	0.193932	0.280226	0.211737
BR	0.350753	0.294264	0.225358	0.353647	0.258700	0.430708	0.564269	0.324610	0.381166	0.552540	0.329726	0.424260	0.286222	0.524841	0.366248	0.373290	0.433049
CC	0.338649	0.306324	0.231875	0.346737	0.253033	0.417957	0.559891	0.318784	0.405635	0.503044	0.289279	0.419147	0.298432	0.522100	0.346917	0.370171	0.386256
LAML-kNN	0.234570	0.153376	0.074692	0.232560	0.179690	0.275761	0.297218	0.234582	0.361640	0.281086	0.162521	0.235320	0.176431	0.511393	0.193932	0.280226	0.212924
RAkEL-O	0.371586	0.330050	0.239347	0.379224	0.288340	0.445645	0.589754	0.351150	0.415982	0.544463	0.329574	0.427891	0.329619	0.623248	0.400055	0.394653	0.379760
RAkEL-D	0.277078	0.277128	0.206757	0.329518	0.230700	0.226111	0.530802	0.259413	0.322778	0.489937	0.250623	0.386387	0.272176	0.540192	0.247008	0.354636	0.340873
LP	0.181909	0.230266	0.123200	0.292930	0.207227	0.272525	0.534435	0.265050	0.335846	0.497835	0.233097	0.370108	0.211894	0.485523	0.226226	0.328906	0.228085
CLR	0.300227	0.213562	0.166888	0.293875	0.194984	0.390796	0.528904	0.272485	0.353472	0.503246	0.245907	0.377671	0.201937	0.483755	0.300342	0.338269	0.281499
HOMER-B	0.244404	0.272025	0.143402	0.322306	0.194443	0.348438	0.448047	0.268271	0.328594	0.404599	0.239748	0.368494	0.264873	0.561678	0.304880	0.342326	0.312945
HOMER-K	0.277763	0.221546	0.139775	0.322306	0.158410	0.378612	0.444900	0.226025	0.320001	0.366302	0.174269	0.355828	0.196964	0.509928	0.266990	0.259635	0.286849
HOMER-R	0.256412	0.240873	0.127646	0.275602	0.212258	0.335930	0.418406	0.228559	0.326558	0.426970	0.223559	0.355960	0.223923	0.529803	0.286521	0.287695	0.268278
ML-DT	0.314724	0.196937	0.160250	0.302407	0.208720	0.386524	0.535507	0.273968	0.193408	0.462622	0.235555	0.372136	0.222235	0.490965	0.314496	0.329913	0.251597
ML-RF	0.282012	0.128301	0.132815	0.280280	0.161484	0.373597	0.540108	0.216784	0.175513	0.443692	0.182001	0.346969	0.131310	0.397106	0.265834	0.303114	0.148465
DBR	0.318175	0.103792	0.086838	0.340087	0.252192	0.414556	0.531670	0.260340	0.363030	0.424081	0.037706	0.407022	0.143754	0.521482	0.345017	0.324318	0.037445
STA	0.360358	0.290190	0.223908	0.358366	0.256561	0.438371	0.572900	0.327599	0.375572	0.561909	0.331089	0.433128	0.285334	0.527531	0.374881	0.379286	0.433373
NS	0.333266	0.172857	0.170634	0.336790	0.251934	0.413284	0.555952	0.319119	0.376336	0.492474	0.259328	0.408906	0.212406	0.519647	0.233994	0.370919	0.284451
ECC	0.340423	0.321357	0.237737	0.343140	0.229736	0.418965	0.560422	0.317078	0.393002	0.562835	0.363642	0.420966	0.330165	0.488526	0.319218	0.375714	0.463477
IBR-ML	0.000000	0.000000	0.002471	0.000044	0.002112	0.002005	0.000430	0.000000	0.000000	0.000000	0.004641	0.001026	0.000000	0.304390	0.000216	0.125050	0.000000
IBR-ML+	0.380564	0.021909	0.022187	0.396992	0.275695	0.447569	0.609935	0.366793	0.508585	0.525329	0.152949	0.445993	0.029691	0.576574	0.245180	0.395906	0.193391
TSVM	0.336041	0.250931	0.207462	0.334315	0.235773	0.417080	0.552802	0.303851	0.364501	0.536893	0.320202	0.412748	0.255591	0.517829	0.348863	0.354993	0.408926
TSCCM	0.336041	0.250931	0.207462	0.334315	0.235773	0.417080	0.552802	0.303851	0.364501	0.536893	0.320202	0.412748	0.255591	0.517829	0.348863	0.354993	0.408926
TSPCCM	0.336041	0.250931	0.207462	0.334315	0.235773	0.417080	0.552802	0.303851	0.364501	0.536893	0.320202	0.412748	0.255591	0.517829	0.350397	0.354993	0.408926
ML-TREE	0.332951	0.293645	0.193074	0.353962	0.243658	0.420215	0.556552	0.288264	0.337451	0.516810	0.315167	0.408780	0.285008	0.569813	0.369213	0.367750	0.405227
MLRS	0.063790	0.155275	0.020468	0.113751	0.065885	0.120381	0.089557	0.064330	0.114697	0.056488	0.095453	0.124880	0.174283	0.217683	0.091415	0.164726	0.100754
MLRS-LC	0.076422	0.138038	0.019898	0.098054	0.058710	0.118248	0.096023	0.092805	0.123995	0.056396	0.108144	0.127156	0.184108	0.304125	0.062686	0.160487	0.094315
MLARAM	0.245941	0.314836	0.026090	0.244148	0.211184	0.338947	0.223427	0.073821	0.327834	0.241927	0.246504	0.307196	0.298563	0.302385	0.208129	0.208773	0.344872
BRkNa	0.024010	0.066665	0.026633	0.144643	0.090212	0.047936	0.100410	0.023518	0.076736	0.061249	0.082291	0.024896	0.072235	0.422634	0.076716	0.167554	0.050587
BRkNNb	0.019647	0.085116	0.015668	0.111251	0.017244	0.073644	0.126929	0.042865	0.123830	0.175266	0.032358	0.118546	0.092668	0.383707	0.041926	0.016630	0.040963

Table 6: Results on F1-micro for each method

Method	semEval2018 spanish	XED-f	GoEmotions	MLEC-AML English	CancerEmo	semEval2018 english	EmoThreat	ExaAEC	semEval2007	cedr	WRIME	NLPCC2018	XED-en	BFRC-PT	semEval2018 arab	MLEC-AML Indo	REDv2
ML-kNN	0.282378	0.154211	0.155158	0.335094	0.374480	0.401138	0.308269	0.343001	0.451988	0.312524	0.250116	0.383871	0.185915	0.619914	0.327270	0.493640	0.226488
BR	0.436125	0.300854	0.280577	0.441422	0.413872	0.541994	0.672099	0.396004	0.456540	0.565224	0.430423	0.487425	0.294871	0.603844	0.467906	0.567358	0.443719
CC	0.420058	0.301031	0.328507	0.436270	0.416283	0.523145	0.666677	0.399121	0.509497	0.513482	0.300349	0.472888	0.294871	0.601200	0.450539	0.553048	0.357398
LAML-kNN	0.282378	0.160495	0.155249	0.335094	0.374480	0.401138	0.308269	0.343001	0.451988	0.312524	0.254983	0.383871	0.187083	0.619914	0.327270	0.493640	0.226848
RAkEL-O	0.436865	0.338404	0.291229	0.462466	0.443869	0.534132	0.653860	0.448042	0.506676	0.567260	0.427473	0.492612	0.337934	0.660680	0.495786	0.547520	0.394027
RAkEL-D	0.326873	0.271299	0.203659	0.419654	0.236601	0.325500	0.530457	0.244602	0.345670	0.483752	0.242637	0.439539	0.269482	0.634007	0.308741	0.406849	0.306030
LP	0.265106	0.247555	0.241045	0.397445	0.383570	0.382598	0.652093	0.363038	0.465920	0.514440	0.348371	0.444842	0.225914	0.590995	0.315924	0.537992	0.256875
CLR	0.383517	0.223442	0.225472	0.384704	0.360389	0.509458	0.664067	0.334357	0.414914	0.518120	0.355196	0.446496	0.212465	0.603164	0.407605	0.547655	0.296747
HOMER-B	0.375340	0.277237	0.201489	0.420115	0.335047	0.477035	0.509641	0.401322	0.406240	0.432523	0.314703	0.419114	0.272651	0.633346	0.400546	0.493411	0.318245
HOMER-K	0.354210	0.248622	0.175669	0.420115	0.292415	0.490800	0.530678	0.271008	0.377909	0.389889	0.287295	0.397212	0.203768	0.579725	0.317948	0.376107	0.296182
HOMER-R	0.326247	0.245811	0.165512	0.338142	0.325837	0.423338	0.472900	0.291208	0.382384	0.441241	0.284807	0.403089	0.232364	0.600541	0.359820	0.403998	0.286842
ML-DT	0.400609	0.206556	0.252366	0.412725	0.399633	0.515099	0.657555	0.359651	0.340118	0.485516	0.353776	0.447045	0.232264	0.618920	0.424247	0.543525	0.274206
ML-RF	0.377188	0.141095	0.231354	0.423125	0.403291	0.529899	0.688724	0.319432	0.335919	0.478811	0.342875	0.467866	0.146292	0.633622	0.409785	0.594282	0.176829
DBR	0.368789	0.179977	0.063707	0.391818	0.326568	0.524857	0.621517	0.340107	0.438899	0.455104	0.038338	0.443851	0.211517	0.601403	0.459546	0.423040	0.041396
STA	0.444476	0.296773	0.277946	0.450312	0.416304	0.550306	0.678369	0.403952	0.449871	0.575289	0.430437	0.500588	0.292601	0.607307	0.472393	0.573747	0.444320
NS	0.412819	0.198582	0.184048	0.430809	0.409650	0.516997	0.666438	0.395849	0.474204	0.509750	0.359337	0.470739	0.233776	0.598459	0.346797	0.559424	0.319400
ECC	0.445249	0.329190	0.327888	0.459053	0.439780	0.556042	0.688813	0.407140	0.488016	0.584946	0.475969	0.502142	0.339032	0.610331	0.466854	0.599604	0.471545
IBLR-ML	0.000000	0.000000	0.003272	0.000058	0.003405	0.003520	0.000638	0.000000	0.000000	0.000000	0.008576	0.001870	0.000000	0.610016	0.000394	0.411592	0.000000
IBLR-ML+	0.451678	0.022890	0.033957	0.498906	0.468559	0.560177	0.686158	0.459620	0.598373	0.560778	0.303612	0.491779	0.032165	0.651584	0.351004	0.577004	0.213403
TSVM	0.428932	0.257895	0.265317	0.428410	0.405100	0.536195	0.670748	0.378275	0.431343	0.550529	0.422096	0.481915	0.264059	0.600004	0.454361	0.558168	0.423896
TSCCM	0.428932	0.257895	0.265317	0.428410	0.405100	0.536195	0.670748	0.378275	0.431343	0.550529	0.422096	0.481915	0.264059	0.600004	0.454361	0.558168	0.423896
TSPCCM	0.428932	0.257895	0.265317	0.428410	0.405100	0.536195	0.670748	0.378275	0.431343	0.550529	0.422096	0.481915	0.264059	0.600004	0.456028	0.558168	0.423896
ML-TREE	0.410072	0.297512	0.256794	0.442917	0.385279	0.535132	0.655051	0.381743	0.413250	0.532036	0.404684	0.467357	0.291746	0.653703	0.474647	0.547256	0.419101
MLRS	0.155649	0.178491	0.183686	0.269488	0.240612	0.278761	0.127757	0.257159	0.270269	0.104735	0.196927	0.369493	0.193055	0.531352	0.191728	0.473693	0.145134
MLRS-LC	0.167876	0.159805	0.185182	0.224501	0.198397	0.242923	0.152560	0.282648	0.263999	0.104523	0.213749	0.369093	0.209226	0.577110	0.150563	0.468508	0.137213
MLARAM	0.324188	0.329690	0.232618	0.289068	0.286440	0.410270	0.252781	0.102786	0.352332	0.344787	0.426687	0.373142	0.313912	0.414867	0.397340	0.253795	0.419219
BRkNa	0.051317	0.071907	0.203964	0.349406	0.349548	0.083210	0.127943	0.059252	0.173944	0.135588	0.171795	0.062965	0.078716	0.623913	0.194036	0.499594	0.060181
BRkNNb	0.052201	0.158754	0.237374	0.155425	0.046807	0.121051	0.358513	0.204491	0.127112	0.308169	0.043752	0.257596	0.166515	0.568282	0.065129	0.057455	0.147295

Table 7: Results on accuracy for each method using FastText

Dataset	BFCR-PT	CancerEmo	CBET	cedr	emothreat	ExaAEC	GoEmotions	MLEC-AML English	MLEC-AML Indo	NLPCC2018	REDv2	semEval2007	semEval2018 arab	semEval2018 english	semEval2018 spanish	WRIME	XED-en	XED-fi
ML-kNN	0.4986	0.3450	0.3394	0.3380	0.6045	0.3428	0.1791	0.2857	0.5196	0.3969	0.2988	0.4616	0.3711	0.3302	0.2518	0.1476	0.2290	0.2259
BR	0.4326	0.2895	0.2188	0.2942	0.5998	0.2498	0.1748	0.2652	0.4069	0.3065	0.2561	0.3215	0.2960	0.2769	0.2119	0.1498	0.1823	0.1799
CC	0.4364	0.3397	0.2654	0.3539	0.6166	0.2898	0.2274	0.2987	0.4635	0.3589	0.3145	0.3250	0.3225	0.2945	0.2222	0.1937	0.2213	0.2043
LAML-kNN	0.4886	0.3274	0.3148	0.3330	0.6558	0.3206	0.1757	0.2752	0.5089	0.3921	0.2923	0.4716	0.3533	0.3108	0.2402	0.1585	0.2158	0.2024
RAKEL-O	0.4933	0.3366	0.2164	0.3111	0.6265	0.2888	0.1810	0.2857	0.4390	0.3598	0.2572	0.3784	0.3309	0.3111	0.2236	0.1503	0.1782	0.1585
RAKEL-D	0.4406	0.2839	0.2180	0.3018	0.5877	0.2483	0.1666	0.2520	0.4132	0.3229	0.2478	0.3169	0.2818	0.2751	0.2153	0.1608	0.1729	0.1657
LP	0.4516	0.3183	0.2522	0.3385	0.6001	0.2834	0.1932	0.2861	0.4472	0.3579	0.2781	0.3743	0.2962	0.2857	0.2195	0.2046	0.2029	0.1878
CLR	0.4422	0.2111	0.1207	0.1713	0.5435	0.1727	0.1036	0.1732	0.3180	0.2167	0.1544	0.2189	0.2252	0.2154	0.1399	0.0660	0.0990	0.0877
HOMER-B	0.4534	0.1448	0.1030	0.1578	0.3325	0.1212	0.0440	0.2056	0.2515	0.2141	0.1282	0.1894	0.2101	0.2302	0.1642	0.0763	0.1055	0.0926
HOMER-K	0.4073	0.1769	0.1017	0.1601	0.3242	0.1076	0.0233	0.2056	0.1683	0.2109	0.1186	0.1749	0.1651	0.2008	0.0988	0.0503	0.0641	0.0773
HOMER-R	0.4115	0.1462	0.0895	0.1557	0.3032	0.0951	0.0291	0.1547	0.2173	0.1920	0.1228	0.2098	0.1581	0.1780	0.1000	0.0728	0.0873	0.0825
ML-DT	0.4575	0.3095	0.2147	0.3082	0.5943	0.2504	0.1683	0.2650	0.4400	0.3484	0.2582	0.3419	0.2971	0.2858	0.2063	0.1750	0.1832	0.1709
ML-RF	0.5178	0.4845	0.2991	0.4315	0.6818	0.3896	0.3494	0.3852	0.5807	0.4786	0.4096	0.5074	0.4375	0.4292	0.3427	0.2599	0.2469	0.2135
DBR	0.4151	0.0735	0.0065	0.0224	0.1426	0.0060	0.0343	0.0107	0.0292	0.1417	0.0423	0.0625	0.1563	0.1825	0.1190	0.0371	0.1259	0.1274
STA	0.4357	0.2961	0.2348	0.3153	0.6040	0.2593	0.1836	0.2740	0.4160	0.3160	0.2603	0.3168	0.2975	0.2819	0.2133	0.1575	0.1858	0.1826
NS	0.4388	0.3342	0.2619	0.3485	0.6121	0.2889	0.2189	0.2979	0.4700	0.3677	0.3025	0.3458	0.3099	0.2924	0.2127	0.1922	0.2197	0.1950
ECC	0.4706	0.2575	0.1091	0.1807	0.5999	0.1882	0.1147	0.1819	0.4216	0.3001	0.1705	0.2937	0.2866	0.2319	0.1558	0.0270	0.0751	0.0579
IBLR-ML	0.4715	0.1292	0.0383	0.0198	0.4808	0.0248	0.0013	0.0853	0.4602	0.2556	0.0076	0.1446	0.1930	0.1126	0.0049	0.0000	0.0000	0.0000
IBLR-ML+	0.5368	0.4592	0.3840	0.5783	0.6960	0.4277	0.3490	0.4544	0.5937	0.5205	0.4893	0.5410	0.4985	0.4264	0.4033	0.0887	0.3419	0.3264
TSVM	0.1808	0.0364	0.0259	0.0412	0.0366	0.0441	0.0197	0.0527	0.0301	0.0461	0.0374	0.0418	0.0770	0.0869	0.0502	0.0451	0.0423	0.0416
TSCCM	0.1817	0.0362	0.0259	0.0462	0.0368	0.0460	0.0188	0.0546	0.0260	0.0515	0.0426	0.0418	0.0804	0.0882	0.0542	0.0482	0.0439	0.0392
TSPCCM	0.1611	0.0196	0.0212	0.0270	0.0180	0.0244	0.0163	0.0357	0.0295	0.0346	0.0276	0.0335	0.0395	0.0440	0.0324	0.0250	0.0350	0.0281
ML-TREE	0.4858	0.0052	0.0265	0.1701	0.0254	0.1252	0.0243	0.0417	0.4730	0.2345	0.0719	0.0190	0.1187	0.2759	0.0887	0.0917	0.0613	0.0549
MLRS	0.4200	0.2841	0.2648	0.3111	0.4065	0.1934	0.2124	0.2554	0.5249	0.3721	0.2700	0.3897	0.3115	0.2416	0.1819	0.0423	0.1600	0.1451
MLRS-LC	0.4492	0.2848	0.2632	0.3062	0.4062	0.2146	0.1979	0.2602	0.5122	0.3514	0.2594	0.4023	0.3509	0.2738	0.2092	0.0448	0.1701	0.1576
MLARAM	0.4439	0.4256	0.3700	0.4648	0.6164	0.3823	0.3590	0.3864	0.5723	0.4433	0.3901	0.4633	0.3832	0.3921	0.3304	0.1894	0.3157	0.2694
BRKNNa	0.4986	0.3520	0.3394	0.3380	0.5771	0.3126	0.1791	0.2857	0.5199	0.3969	0.2988	0.4616	0.3711	0.3301	0.2518	0.1484	0.2290	0.2259
BRKNNb	0.4898	0.3834	0.4137	0.3841	0.5799	0.3342	0.2981	0.3210	0.5464	0.4176	0.3524	0.4931	0.3617	0.3354	0.2530	0.1937	0.2784	0.2727

Table 8: Results on F1-score for each method using FastText

Dataset	BFRC-PT	CancerEmo	CBET	cedr	emothreat	ExaAEC	GoEmotions	MLEC-AML English	MLEC-AML Indo	NLPCC2018	REDv2	semEval2007	semEval2018 arab	semEval2018 english	semEval2018 spanish	WRIME	XED-en	XED-fi	
ML-kNN	0.6830	0.3867	0.3481	0.3411	0.6606	0.3987	0.1902	0.3322	0.5501	0.4347	0.3188	0.5007	0.4868	0.4370	0.3303	0.1625	0.2621	0.2613	0.3936
BR	0.6158	0.3522	0.2566	0.3386	0.6634	0.3179	0.2190	0.3433	0.4623	0.3715	0.3071	0.3805	0.4311	0.4113	0.3097	0.1936	0.2420	0.2406	0.3587
CC	0.6226	0.3862	0.2763	0.3612	0.6705	0.3393	0.2582	0.3604	0.5019	0.4059	0.3492	0.3903	0.4402	0.4101	0.3080	0.2210	0.2677	0.2538	0.3790
LAML-kNN	0.6725	0.3650	0.3239	0.3380	0.7010	0.3688	0.1866	0.3228	0.5420	0.4268	0.3140	0.5135	0.4671	0.4162	0.3187	0.1815	0.2467	0.2358	0.3856
RAREL-O	0.6718	0.3818	0.2304	0.3346	0.6745	0.3395	0.2061	0.3469	0.4747	0.4075	0.2898	0.4249	0.4554	0.4288	0.2934	0.1752	0.2122	0.1918	0.3633
RAREL-D	0.6273	0.3386	0.2504	0.3317	0.6469	0.3128	0.2077	0.3246	0.4676	0.3768	0.2923	0.3647	0.4054	0.4005	0.3069	0.2014	0.2245	0.2182	0.3499
LP	0.6404	0.3525	0.2601	0.3425	0.6479	0.3263	0.2058	0.3444	0.4802	0.3938	0.3004	0.4090	0.3981	0.3823	0.2915	0.2279	0.2332	0.2228	0.3589
CLR	0.6381	0.2409	0.1315	0.1955	0.5819	0.2030	0.1107	0.2143	0.3497	0.2505	0.1749	0.2531	0.3147	0.3068	0.1847	0.0832	0.1214	0.1088	0.2480
HOMER-B	0.6387	0.2112	0.1535	0.1914	0.4633	0.1684	0.0630	0.2521	0.3300	0.2535	0.1849	0.2606	0.2981	0.3393	0.2525	0.1110	0.1588	0.1430	0.2485
HOMER-K	0.5965	0.2649	0.1294	0.1859	0.4378	0.1358	0.0257	0.2521	0.2267	0.2543	0.1536	0.2046	0.2428	0.2787	0.1401	0.0539	0.0772	0.1121	0.2096
HOMER-R	0.5961	0.2161	0.1347	0.1968	0.4242	0.1458	0.0434	0.2190	0.3042	0.2614	0.1782	0.2810	0.2461	0.2657	0.1489	0.1078	0.1362	0.1302	0.2242
ML-DT	0.6444	0.3333	0.2211	0.3109	0.6368	0.2840	0.1775	0.3156	0.4596	0.3771	0.2736	0.3628	0.3935	0.3769	0.2667	0.1894	0.2082	0.2008	0.3351
ML-RF	0.6920	0.5570	0.3151	0.4932	0.7320	0.4627	0.3666	0.4585	0.6343	0.5216	0.4463	0.5796	0.5593	0.5566	0.4552	0.3162	0.2864	0.2492	0.4823
DBR	0.6029	0.0863	0.0071	0.0232	0.1900	0.0073	0.0425	0.0125	0.0307	0.1653	0.0463	0.0768	0.2435	0.2921	0.1702	0.0459	0.1717	0.1783	0.1329
STA	0.6194	0.3564	0.2660	0.3529	0.6657	0.3239	0.2246	0.3486	0.4664	0.3772	0.3104	0.3794	0.4321	0.4161	0.3079	0.1977	0.2455	0.2429	0.3630
NS	0.6258	0.3803	0.2764	0.3600	0.6674	0.3410	0.2521	0.3630	0.5095	0.4117	0.3390	0.4158	0.4323	0.4059	0.2961	0.2219	0.2693	0.2463	0.3786
ECC	0.6528	0.2701	0.1112	0.1811	0.6324	0.2054	0.1195	0.2100	0.4409	0.3145	0.1759	0.3197	0.3734	0.3024	0.1878	0.0286	0.0818	0.0639	0.2595
IBLR-ML	0.6426	0.1338	0.0383	0.0198	0.4929	0.0251	0.0013	0.0979	0.4798	0.2654	0.0077	0.1522	0.2442	0.1436	0.0057	0.0000	0.0000	0.0000	0.1528
IBLR-ML+	0.7098	0.5049	0.4729	0.6328	0.7578	0.5007	0.4231	0.5372	0.6430	0.5847	0.5799	0.6445	0.6381	0.5436	0.5001	0.0948	0.4188	0.4036	0.5328
TSVM	0.2896	0.0440	0.0297	0.0435	0.0493	0.0561	0.0210	0.0668	0.0346	0.0554	0.0431	0.0476	0.1208	0.1392	0.0723	0.0552	0.0531	0.0546	0.0709
TSCCM	0.2903	0.0437	0.0299	0.0487	0.0498	0.0572	0.0199	0.0699	0.0299	0.0612	0.0483	0.0476	0.1224	0.1413	0.0769	0.0585	0.0546	0.0521	0.0723
TSPCCM	0.2617	0.0245	0.0242	0.0290	0.0247	0.0302	0.0181	0.0450	0.0324	0.0413	0.0325	0.0359	0.0639	0.0730	0.0460	0.0304	0.0443	0.0393	0.0498
ML-TREE	0.6630	0.0059	0.0289	0.1878	0.0338	0.1405	0.0272	0.0515	0.4940	0.2614	0.0791	0.0216	0.1672	0.3625	0.1146	0.1045	0.0742	0.0670	0.1603
MLRS	0.6014	0.3045	0.2721	0.3201	0.4065	0.2171	0.2226	0.2976	0.5520	0.3990	0.2846	0.4364	0.4005	0.3026	0.2284	0.0448	0.1784	0.1653	0.3130
MLRS-LC	0.6315	0.3028	0.2699	0.3115	0.4062	0.2418	0.2070	0.3035	0.5369	0.3711	0.2725	0.4385	0.4474	0.3478	0.2607	0.0476	0.1875	0.1785	0.3202
MLARAM	0.6446	0.5138	0.4448	0.5687	0.6685	0.4790	0.4052	0.4984	0.6414	0.5292	0.4795	0.5569	0.5170	0.5361	0.4564	0.2776	0.4250	0.3672	0.5005
BRkNNa	0.6830	0.3871	0.3481	0.3411	0.5996	0.3598	0.1902	0.3322	0.5505	0.4347	0.3188	0.5007	0.4868	0.4369	0.3303	0.1631	0.2620	0.2613	0.3881
BRkNNb	0.6652	0.4233	0.4224	0.3862	0.6064	0.3976	0.3228	0.3792	0.5740	0.4613	0.3774	0.5297	0.4895	0.4511	0.3492	0.2171	0.3284	0.3282	0.4283

Table 9: Results on F1-macro for each method using FastText

Dataset	BFRc-PT	CancerEmo	CBET	cedr	emothreat	ExaAEC	GoEmotions	MLEC-AML English	MLEC-AML Indo	NLPCC2018	REDv2	semEval2007	semEval2018 arab	semEval2018 english	semEval2018 spanish	WRIME	XED-en	XED-fi	
ML-kNN	0.6540	0.4091	0.4251	0.3939	0.5977	0.4063	0.2465	0.3844	0.5832	0.4585	0.3679	0.5472	0.4881	0.4433	0.3422	0.1949	0.2975	0.2951	0.4186
BR	0.5974	0.3704	0.2939	0.3851	0.6185	0.3345	0.2364	0.3725	0.4896	0.3981	0.3395	0.4075	0.4229	0.4052	0.3066	0.2196	0.2651	0.2628	0.3736
CC	0.5999	0.3696	0.2791	0.3600	0.6143	0.3251	0.2386	0.3613	0.4897	0.3919	0.3367	0.3975	0.4372	0.4014	0.2919	0.2154	0.2602	0.2457	0.3675
LAML-kNN	0.6432	0.3940	0.3973	0.3866	0.6579	0.3845	0.2403	0.3727	0.5705	0.4536	0.3558	0.5482	0.4721	0.4236	0.3280	0.2112	0.2800	0.2708	0.4106
RAREL-O	0.6517	0.4189	0.3110	0.3862	0.6526	0.3742	0.2508	0.3965	0.5269	0.4332	0.3425	0.4628	0.4590	0.4346	0.3161	0.2116	0.2567	0.2348	0.3956
RAREL-D	0.6022	0.3585	0.2818	0.3614	0.5987	0.3262	0.2230	0.3513	0.4882	0.3975	0.3191	0.3854	0.4082	0.3949	0.3109	0.2261	0.2426	0.2364	0.3618
LP	0.6099	0.3438	0.2615	0.3417	0.5865	0.3145	0.1980	0.3486	0.4743	0.3842	0.2972	0.3982	0.3881	0.3770	0.2818	0.2241	0.2287	0.2193	0.3487
CLR	0.6041	0.3213	0.2207	0.2960	0.6061	0.2816	0.1710	0.3019	0.4552	0.3334	0.2582	0.3467	0.3666	0.3517	0.2341	0.1379	0.1833	0.1676	0.3132
HOMER-B	0.6255	0.2922	0.2541	0.2769	0.4857	0.2467	0.1316	0.3566	0.4371	0.3202	0.2639	0.3516	0.3653	0.3915	0.3190	0.1754	0.2410	0.2176	0.3195
HOMER-K	0.5770	0.3601	0.2250	0.2545	0.4861	0.2022	0.0457	0.3566	0.3134	0.3098	0.2351	0.2847	0.2972	0.3445	0.1932	0.0844	0.1169	0.1904	0.2709
HOMER-R	0.5841	0.2976	0.2285	0.2795	0.4649	0.2253	0.1034	0.2992	0.3951	0.3445	0.2643	0.3734	0.2886	0.3115	0.2091	0.1730	0.2089	0.1994	0.2917
ML-DT	0.6145	0.3444	0.2494	0.3283	0.5968	0.2959	0.2021	0.3456	0.4726	0.3806	0.2894	0.3827	0.4102	0.3824	0.2730	0.1984	0.2194	0.2104	0.3442
ML-RF	0.6648	0.5252	0.4153	0.5201	0.7034	0.4668	0.3747	0.5055	0.6225	0.5273	0.4754	0.5541	0.5594	0.5372	0.4283	0.3226	0.3400	0.3015	0.4913
DBR	0.5824	0.1272	0.0145	0.0438	0.2131	0.0136	0.0590	0.0211	0.0513	0.2283	0.0768	0.1283	0.2430	0.2900	0.1858	0.0672	0.1974	0.1925	0.1520
STA	0.5999	0.3710	0.2996	0.3924	0.6220	0.3387	0.2387	0.3750	0.4923	0.3996	0.3413	0.4163	0.4247	0.4096	0.3056	0.2179	0.2675	0.2638	0.3764
NS	0.6018	0.3655	0.2797	0.3607	0.6117	0.3286	0.2378	0.3662	0.4999	0.3988	0.3303	0.4231	0.4203	0.3991	0.2873	0.2185	0.2625	0.2421	0.3686
ECC	0.6176	0.3524	0.1966	0.2781	0.6488	0.2804	0.1803	0.3014	0.5432	0.3993	0.2593	0.4233	0.4177	0.3549	0.2287	0.0481	0.1262	0.1001	0.3198
IBLR-ML	0.6143	0.2066	0.0704	0.0382	0.4623	0.0380	0.0023	0.1528	0.5470	0.3522	0.0137	0.2331	0.3166	0.1964	0.0078	0.0000	0.0000	0.0000	0.1806
IBLR-ML+	0.6826	0.5391	0.4640	0.6369	0.7179	0.5210	0.4204	0.5776	0.6668	0.5959	0.5720	0.6052	0.6301	0.5581	0.5082	0.1422	0.4481	0.4308	0.5398
TSVM	0.3104	0.0727	0.0553	0.0721	0.0907	0.0891	0.0361	0.1006	0.0577	0.0897	0.0714	0.0743	0.1527	0.1630	0.1050	0.0904	0.0854	0.0911	0.1004
TSCCM	0.3127	0.0729	0.0555	0.0802	0.0921	0.0905	0.0339	0.1047	0.0507	0.0969	0.0794	0.0743	0.1518	0.1677	0.1100	0.0951	0.0853	0.0864	0.1022
TSPCCM	0.2862	0.0428	0.0432	0.0486	0.0451	0.0462	0.0297	0.0676	0.0518	0.0685	0.0523	0.0579	0.0822	0.0859	0.0655	0.0494	0.0679	0.0664	0.0698
ML-TREE	0.6387	0.0108	0.0526	0.2788	0.0833	0.1878	0.0473	0.0861	0.4851	0.3403	0.1238	0.0405	0.1909	0.3553	0.1483	0.1517	0.1147	0.1016	0.1910
MLRS	0.5576	0.3790	0.3821	0.4054	0.4220	0.2884	0.2906	0.3974	0.6073	0.4571	0.3613	0.5024	0.4534	0.3614	0.2696	0.0728	0.2427	0.2277	0.3710
MLRS-LC	0.5902	0.3729	0.3785	0.3970	0.4218	0.3093	0.2760	0.3994	0.6035	0.4427	0.3477	0.5159	0.4815	0.3906	0.2990	0.0766	0.2466	0.2364	0.3770
MLARAM	0.5877	0.4621	0.3884	0.5192	0.5923	0.4290	0.3577	0.4626	0.5793	0.4837	0.4267	0.5263	0.4915	0.4998	0.4073	0.2657	0.3674	0.3254	0.4540
BRkNNa	0.6540	0.4130	0.4251	0.3939	0.5558	0.3890	0.2465	0.3845	0.5835	0.4585	0.3679	0.5472	0.4881	0.4432	0.3422	0.1972	0.2974	0.2951	0.4157
BRkNNb	0.6477	0.4074	0.4215	0.3849	0.5548	0.3838	0.3048	0.3810	0.5632	0.4455	0.3675	0.5348	0.4778	0.4425	0.3393	0.2129	0.3156	0.3141	0.4166

Table 10: Results on F1-micro for each method using FastText

Dataset	BFRC-PT	CancerEmo	CBET	cedr	emothreat	ExaAEC	GoEmotions	MLEC-AML English	MLEC-AML Indo	NLPCC2018	REDv2	semEval2007	semEval2018 arab	semEval2018 english	semEval2018 spanish	WRIME	XED-en	XED-fi	
ML-kNN	0.5616	0.2146	0.4187	0.3512	0.4930	0.3225	0.1324	0.2689	0.3161	0.3668	0.3414	0.5172	0.3678	0.3228	0.2332	0.1310	0.2545	0.2540	0.3260
BR	0.5229	0.2235	0.2907	0.3446	0.4995	0.2705	0.1333	0.2915	0.3137	0.3448	0.3229	0.3391	0.3366	0.3235	0.2366	0.1527	0.2311	0.2308	0.3005
CC	0.5227	0.2232	0.2761	0.3115	0.5021	0.2646	0.1326	0.2801	0.3259	0.3330	0.3168	0.3322	0.3490	0.3107	0.2313	0.1490	0.2264	0.2150	0.2946
LAML-kNN	0.5510	0.2020	0.3891	0.3454	0.5407	0.3040	0.1214	0.2588	0.3133	0.3597	0.3324	0.4778	0.3457	0.3054	0.2242	0.1436	0.2395	0.2332	0.3160
RAREL-O	0.5558	0.2024	0.3019	0.3249	0.5004	0.2746	0.1157	0.2616	0.2821	0.3293	0.3092	0.3235	0.3192	0.3008	0.1969	0.1142	0.2110	0.1927	0.2842
RAREL-D	0.5251	0.2181	0.2787	0.3155	0.4736	0.2577	0.1177	0.2664	0.3092	0.3390	0.3018	0.3278	0.3133	0.3069	0.2333	0.1554	0.2102	0.2053	0.2864
LP	0.5140	0.1885	0.2596	0.3012	0.4444	0.2363	0.0887	0.2571	0.2763	0.3260	0.2831	0.2756	0.2805	0.2711	0.2053	0.1477	0.1976	0.1890	0.2634
CLR	0.4929	0.1519	0.2124	0.2522	0.4475	0.2155	0.0707	0.2122	0.2454	0.2694	0.2397	0.2880	0.2578	0.2401	0.1522	0.0802	0.1585	0.1414	0.2293
HOMER-B	0.5523	0.1941	0.2493	0.2455	0.4211	0.1447	0.0539	0.2698	0.2874	0.2851	0.2510	0.2781	0.2370	0.2321	0.1527	0.1358	0.2102	0.1951	0.2442
HOMER-K	0.5081	0.1640	0.2124	0.2422	0.3803	0.1505	0.0305	0.2698	0.2061	0.2848	0.2131	0.2080	0.2396	0.2407	0.1469	0.0444	0.0985	0.1473	0.2104
HOMER-R	0.5327	0.1897	0.2259	0.2539	0.4018	0.1659	0.0513	0.2420	0.2461	0.2983	0.2462	0.3018	0.2286	0.2450	0.1564	0.1260	0.1876	0.1794	0.2377
ML-DT	0.5200	0.1781	0.2461	0.2796	0.4563	0.2216	0.0838	0.2504	0.2732	0.3146	0.2664	0.2776	0.2976	0.2687	0.1901	0.1303	0.1902	0.1804	0.2569
ML-RF	0.4919	0.2139	0.3933	0.3955	0.5491	0.3009	0.1002	0.3017	0.3189	0.3681	0.4027	0.3536	0.3451	0.3116	0.2112	0.1221	0.2733	0.2259	0.3155
DBR	0.4838	0.0878	0.0121	0.0401	0.1155	0.0193	0.0462	0.0182	0.0355	0.1880	0.0690	0.1205	0.1860	0.2190	0.1307	0.0569	0.1555	0.1566	0.1189
STA	0.5250	0.2206	0.2959	0.3527	0.5022	0.2748	0.1333	0.2910	0.3059	0.3454	0.3248	0.3560	0.3381	0.3253	0.2331	0.1483	0.2331	0.2315	0.3021
NS	0.5260	0.2204	0.2764	0.3036	0.4944	0.2671	0.1325	0.2834	0.3230	0.3390	0.3129	0.3526	0.3324	0.3134	0.2164	0.1506	0.2287	0.2121	0.2936
ECC	0.4725	0.1414	0.1832	0.2069	0.4546	0.1859	0.0718	0.1817	0.2472	0.2560	0.2264	0.3144	0.2685	0.2179	0.1296	0.0253	0.1049	0.0806	0.2094
IBLR-ML	0.3198	0.0657	0.0560	0.0239	0.1801	0.0193	0.0003	0.0619	0.1866	0.1329	0.0133	0.1260	0.1843	0.1023	0.0039	0.0000	0.0000	0.0000	0.0820
IBLR-ML+	0.5643	0.2439	0.4578	0.6206	0.6128	0.4321	0.2370	0.4328	0.4370	0.5310	0.5539	0.5529	0.4541	0.3813	0.3619	0.0657	0.3911	0.3719	0.4279
TSVM	0.3148	0.0638	0.0549	0.0689	0.1039	0.0771	0.0156	0.0913	0.0545	0.0895	0.0675	0.0681	0.1247	0.1383	0.0935	0.0655	0.0748	0.0794	0.0915
TSCCM	0.3173	0.0633	0.0552	0.0772	0.1065	0.0777	0.0146	0.0929	0.0428	0.0970	0.0771	0.0681	0.1238	0.1425	0.0975	0.0694	0.0739	0.0742	0.0928
TSPCCM	0.2900	0.0414	0.0412	0.0518	0.0586	0.0420	0.0218	0.0622	0.0435	0.0681	0.0506	0.0468	0.0783	0.0833	0.0629	0.0409	0.0563	0.0578	0.0665
ML-TREE	0.4451	0.0133	0.0331	0.1386	0.0981	0.0555	0.0117	0.0578	0.1647	0.1541	0.0669	0.0738	0.0838	0.1578	0.0501	0.0581	0.0506	0.0474	0.0978
MLRS	0.2832	0.1607	0.3704	0.3381	0.1147	0.1643	0.1128	0.2355	0.2969	0.2977	0.3156	0.3319	0.2752	0.1932	0.1059	0.0362	0.1949	0.1834	0.2228
MLRS-LC	0.3550	0.1607	0.3652	0.3396	0.1145	0.1809	0.1068	0.2430	0.2859	0.2866	0.2988	0.3392	0.3141	0.2242	0.1437	0.0388	0.1975	0.1905	0.2325
MLARAM	0.4247	0.2804	0.3886	0.4725	0.4329	0.3423	0.1784	0.3485	0.3937	0.3714	0.4123	0.4910	0.3355	0.3197	0.2694	0.2059	0.3198	0.2533	0.3467
BRkNNa	0.5616	0.2074	0.4187	0.3512	0.4004	0.3136	0.1341	0.2689	0.3161	0.3668	0.3414	0.5172	0.3678	0.3228	0.2332	0.1272	0.2544	0.2540	0.3198
BRkNNb	0.5675	0.2218	0.4214	0.3642	0.4113	0.3213	0.1463	0.2922	0.3337	0.3847	0.3402	0.4904	0.3760	0.3433	0.2540	0.1550	0.2702	0.2719	0.3314

Table 11: Results on accuracy for each method using sBERT

Dataset	BFR-PT	CancerEmo	CBET	cedr	emothreat	ExaAEC	GoEmotions	MLEC-AML English	MLEC-AML Indo	NLPCC2018	REDv2	semEval2007	semEval2018 arab	semEval2018 english	semEval2018 spanish	WRIME	XED-en	XED-fi
ML-kNN	0.4916	0.4453	0.3796	0.5290	0.6671	0.2771	0.2101	0.3619	0.5474	0.3893	0.3471	0.6255	0.3506	0.4164	0.3281	0.3666	0.3125	0.2830
BR	0.4314	0.3483	0.2409	0.4315	0.5457	0.2445	0.1884	0.2997	0.4324	0.3119	0.2815	0.3596	0.3137	0.3421	0.2639	0.3019	0.2188	0.2294
CC	0.4309	0.3854	0.2864	0.4959	0.5717	0.2765	0.2442	0.3411	0.4833	0.3584	0.3321	0.3825	0.3176	0.3440	0.2765	0.3480	0.2591	0.2605
LAML-kNN	0.4786	0.4234	0.3601	0.5441	0.6561	0.2764	0.2054	0.3659	0.5267	0.3769	0.3477	0.6386	0.3532	0.4186	0.3137	0.3575	0.3039	0.2772
RAKEL-O	0.4668	0.3990	0.2421	0.4457	0.5813	0.2426	0.2105	0.3231	0.4891	0.3357	0.3000	0.4360	0.3612	0.3509	0.2907	0.3361	0.2083	0.2359
RAKEL-D	0.4266	0.3296	0.2363	0.4256	0.5347	0.2303	0.1822	0.3011	0.4566	0.3316	0.2824	0.4147	0.2923	0.3319	0.2587	0.2879	0.2213	0.2289
LP	0.4440	0.3822	0.2749	0.4617	0.5774	0.2695	0.2104	0.3302	0.4644	0.3548	0.3326	0.4802	0.3311	0.3423	0.2614	0.3317	0.2371	0.2426
CLR	0.4290	0.2735	0.1494	0.3308	0.4747	0.1615	0.1138	0.2161	0.3567	0.2185	0.2033	0.2389	0.2895	0.2923	0.2003	0.2088	0.1374	0.1513
HOMER-B	0.4574	0.1686	0.1127	0.2682	0.3164	0.1214	0.0464	0.2573	0.2800	0.2122	0.1511	0.2070	0.2302	0.2675	0.1838	0.1445	0.1327	0.1208
HOMER-K	0.4013	0.1875	0.1193	0.2797	0.2963	0.1067	0.0322	0.2573	0.2006	0.2263	0.1560	0.1913	0.1855	0.2631	0.1495	0.1661	0.0841	0.1240
HOMER-R	0.4429	0.1711	0.0899	0.2340	0.2714	0.1013	0.0314	0.1748	0.2079	0.2001	0.1283	0.1969	0.1914	0.2058	0.1453	0.1389	0.1043	0.1124
ML-DT	0.4423	0.3675	0.2406	0.4339	0.5641	0.2479	0.1835	0.3018	0.4860	0.3438	0.3128	0.3983	0.3111	0.3428	0.2472	0.3079	0.2270	0.2284
ML-RF	0.5019	0.5322	0.3202	0.5995	0.6836	0.3894	0.3769	0.3851	0.5977	0.4675	0.4800	0.5916	0.4529	0.4866	0.3906	0.4389	0.3327	0.3336
DBR	0.4162	0.1037	0.0098	0.0430	0.0310	0.0110	0.0454	0.0108	0.0355	0.1626	0.0583	0.1033	0.1425	0.1809	0.1390	0.0427	0.1291	0.1394
STA	0.4328	0.3582	0.2576	0.4518	0.5561	0.2555	0.1955	0.3117	0.4437	0.3184	0.2911	0.3613	0.3157	0.3479	0.2668	0.3175	0.2231	0.2310
NS	0.4327	0.3760	0.2851	0.5024	0.5604	0.2753	0.2347	0.3351	0.4728	0.3575	0.3295	0.3876	0.3157	0.3450	0.2821	0.3423	0.2510	0.2545
ECC	0.4616	0.3495	0.1457	0.4209	0.5648	0.1731	0.1361	0.2621	0.4656	0.2960	0.2302	0.3260	0.3220	0.3528	0.2512	0.2506	0.1390	0.1619
IBLR-ML	0.4680	0.3161	0.0699	0.2701	0.5303	0.0091	0.0052	0.2115	0.4584	0.2805	0.0532	0.4830	0.1881	0.3063	0.0569	0.0686	0.0034	0.0066
IBLR-ML+	0.5225	0.5184	0.3902	0.6793	0.7087	0.4052	0.3723	0.4900	0.5939	0.4895	0.5110	0.6281	0.4625	0.5103	0.4491	0.5166	0.4081	0.3988
TSVM	0.1774	0.0285	0.0262	0.0297	0.0413	0.0421	0.0198	0.0490	0.0311	0.0458	0.0419	0.0471	0.0951	0.0829	0.0540	0.0383	0.0434	0.0483
TSCCM	0.1764	0.0293	0.0262	0.0295	0.0405	0.0428	0.0185	0.0496	0.0279	0.0516	0.0412	0.0471	0.0899	0.0857	0.0545	0.0378	0.0410	0.0445
TSPCCM	0.1623	0.0164	0.0178	0.0157	0.0254	0.0226	0.0141	0.0275	0.0157	0.0454	0.0286	0.0477	0.0449	0.0433	0.0272	0.0206	0.0299	0.0278
ML-TREE	0.4842	0.0055	0.0288	0.2204	0.0295	0.1257	0.0286	0.0480	0.4931	0.2452	0.0753	0.0240	0.1210	0.2976	0.1035	0.1499	0.0677	0.0674
MLRS	0.4184	0.4219	0.3259	0.5356	0.5839	0.2557	0.2397	0.3495	0.5386	0.3423	0.3312	0.5649	0.3185	0.3810	0.2755	0.3506	0.2759	0.2491
MLRS-LC	0.4478	0.4232	0.3236	0.5440	0.5938	0.2302	0.2339	0.3546	0.5376	0.3344	0.3321	0.5549	0.3512	0.4023	0.2880	0.3604	0.2716	0.2462
MLARAM	0.4762	0.4782	0.4850	0.6174	0.6908	0.3623	0.3207	0.4219	0.5834	0.4516	0.4533	0.6526	0.4109	0.4545	0.3941	0.4550	0.3764	0.3659
BRkNNa	0.4916	0.4453	0.3796	0.5221	0.6574	0.2772	0.2101	0.3619	0.5474	0.3893	0.3471	0.6255	0.3523	0.4164	0.3281	0.3666	0.3125	0.2830
BRkNNb	0.3890	0.0859	0.1058	0.1172	0.4328	0.0863	0.2999	0.1060	0.0523	0.1801	0.1344	0.1660	0.0424	0.0560	0.0343	0.0103	0.0196	0.0185

Table 12: Results on F1-score for each method using sBERT

Dataset	BFR-PT	CancerEmo	CBET	cedr	emothreat	ExaAEC	GoEmotions	MLEC-AML English	MLEC-AML Indo	NLPCC2018	REDv2	semEval2007	semEval2018 arab	semEval2018 english	semEval2018 spanish	WRIME	XED-en	XED-fi
ML-kNN	0.6739	0.4800	0.3906	0.5423	0.7179	0.3127	0.2228	0.4230	0.5767	0.4255	0.3688	0.6610	0.4679	0.5389	0.4132	0.3964	0.3521	0.3261
BR	0.6149	0.4136	0.2810	0.4751	0.6169	0.3115	0.2343	0.3834	0.4934	0.3748	0.3418	0.4178	0.4433	0.4879	0.3753	0.3659	0.2836	0.3005
CC	0.6172	0.4325	0.2993	0.5050	0.6263	0.3226	0.2766	0.4110	0.5256	0.4082	0.3738	0.4339	0.4381	0.4707	0.3779	0.3908	0.3144	0.3275
LAML-kNN	0.6612	0.4559	0.3712	0.5519	0.7064	0.3115	0.2182	0.4295	0.5600	0.4118	0.3738	0.6722	0.4680	0.5425	0.4050	0.3895	0.3405	0.3201
RAKEL-O	0.6513	0.4392	0.2546	0.4714	0.6279	0.2903	0.2300	0.3878	0.5372	0.3884	0.3263	0.4752	0.4868	0.4781	0.3725	0.3834	0.2403	0.2785
RAKEL-D	0.6100	0.3871	0.2694	0.4583	0.5953	0.2930	0.2234	0.3764	0.5081	0.3857	0.3347	0.4634	0.4180	0.4649	0.3578	0.3432	0.2792	0.2922
LP	0.6339	0.4215	0.2839	0.4671	0.6202	0.3091	0.2240	0.3960	0.4991	0.3895	0.3605	0.5193	0.4417	0.4527	0.3416	0.3664	0.2739	0.2845
CLR	0.6248	0.3058	0.1620	0.3553	0.5160	0.1899	0.1220	0.2640	0.3965	0.2532	0.2319	0.2712	0.3869	0.3981	0.2567	0.2386	0.1656	0.1850
HOMER-B	0.6454	0.2459	0.1676	0.3204	0.4426	0.1688	0.0667	0.3155	0.3684	0.2503	0.2168	0.2841	0.3268	0.3901	0.2820	0.2081	0.1990	0.1858
HOMER-K	0.5925	0.2808	0.1499	0.3190	0.3957	0.1333	0.0357	0.3155	0.2672	0.2718	0.1945	0.2266	0.2738	0.3542	0.2061	0.1807	0.1024	0.1788
HOMER-R	0.6279	0.2346	0.1352	0.2947	0.3866	0.1541	0.0476	0.2507	0.2867	0.2543	0.1838	0.2665	0.2917	0.3195	0.2147	0.2004	0.1603	0.1735
ML-DT	0.6310	0.3925	0.2479	0.4375	0.6035	0.2784	0.1934	0.3561	0.5085	0.3706	0.3322	0.4265	0.4163	0.4457	0.3194	0.3343	0.2574	0.2660
ML-RF	0.6762	0.5933	0.3382	0.6264	0.7436	0.4550	0.3982	0.4539	0.6535	0.5091	0.5296	0.6495	0.5790	0.6165	0.4898	0.4934	0.3883	0.3996
DBR	0.6039	0.1187	0.0102	0.0445	0.0430	0.0134	0.0569	0.0127	0.0386	0.1905	0.0651	0.1185	0.2206	0.2891	0.2042	0.0513	0.1719	0.1953
STA	0.6165	0.4234	0.2909	0.4907	0.6254	0.3183	0.2385	0.3931	0.5034	0.3790	0.3497	0.4174	0.4448	0.4918	0.3765	0.3784	0.2877	0.3028
NS	0.6186	0.4275	0.3017	0.5127	0.6144	0.3254	0.2686	0.4052	0.5170	0.4048	0.3704	0.4370	0.4382	0.4739	0.3812	0.3864	0.3083	0.3162
ECC	0.6457	0.3678	0.1495	0.4227	0.5953	0.1891	0.1414	0.3003	0.4866	0.3100	0.2395	0.3538	0.4109	0.4506	0.3038	0.2651	0.1498	0.1788
IBLR-ML	0.6382	0.3299	0.0701	0.2716	0.5562	0.0092	0.0053	0.2399	0.4778	0.2927	0.0554	0.4983	0.2428	0.3748	0.0679	0.0710	0.0035	0.0070
IBLR-ML+	0.6980	0.5744	0.4868	0.7363	0.7851	0.4744	0.4703	0.5775	0.6444	0.5436	0.6107	0.7252	0.5851	0.6380	0.5573	0.5988	0.5046	0.5002
TSVM	0.2875	0.0341	0.0299	0.0312	0.0557	0.0530	0.0215	0.0620	0.0354	0.0552	0.0489	0.0531	0.1457	0.1311	0.0764	0.0457	0.0543	0.0610
TSCCM	0.2856	0.0349	0.0299	0.0309	0.0540	0.0542	0.0202	0.0626	0.0319	0.0612	0.0489	0.0531	0.1393	0.1350	0.0748	0.0452	0.0518	0.0570
TSPCCM	0.2653	0.0191	0.0203	0.0169	0.0333	0.0283	0.0155	0.0353	0.0189	0.0548	0.0331	0.0519	0.0730	0.0702	0.0373	0.0243	0.0375	0.0350
ML-TREE	0.6627	0.0061	0.0311	0.2373	0.0387	0.1389	0.0321	0.0600	0.5159	0.2740	0.0821	0.0346	0.1687	0.3924	0.1349	0.1657	0.0802	0.0820
MLRS	0.5985	0.4479	0.3358	0.5423	0.6277	0.2877	0.2528	0.4104	0.5644	0.3621	0.3512	0.6053	0.4070	0.4728	0.3440	0.3813	0.3077	0.2823
MLRS-LC	0.6279	0.4465	0.3318	0.5507	0.6431	0.2546	0.2463	0.4180	0.5631	0.3516	0.3524	0.5927	0.4536	0.5025	0.3574	0.3923	0.2985	0.2797
MLARAM	0.6722	0.5480	0.5418	0.6739	0.7581	0.4623	0.3924	0.5238	0.6455	0.5327	0.5288	0.7074	0.5646	0.5968	0.5208	0.5428	0.4599	0.4575
BRkNNa	0.6739	0.4800	0.3906	0.5276	0.7044	0.3127	0.2229	0.4230	0.5767	0.4255	0.3688	0.6610	0.4691	0.5389	0.4132	0.3964	0.3521	0.3261
BRkNNb	0.5642	0.1003	0.1064	0.1186	0.4534	0.1127	0.3153	0.1355	0.0554	0.2100	0.1460	0.1917	0.0717	0.0941	0.0540	0.0147	0.0283	0.0268

Table 13: Results on F1-macro for each method using sBERT

Dataset	BFRc-PT	CancerEmo	CBET	cedr	emothreat	ExaAEC	GoEmotions	MLEC-AML English	MLEC-AML Indo	NLPCC2018	REDv2	semEval2007	semEval2018 arab	semEval2018 english	semEval2018 spanish	WRIME	XED-en	XED-fi
ML-kNN	0.6739	0.4800	0.3906	0.5423	0.7179	0.3127	0.2228	0.4230	0.5767	0.4255	0.3688	0.6610	0.4679	0.5389	0.4132	0.3964	0.3521	0.3261
BR	0.6149	0.4136	0.2810	0.4751	0.6169	0.3115	0.2343	0.3834	0.4934	0.3748	0.3418	0.4178	0.4433	0.4879	0.3753	0.3659	0.2836	0.3005
CC	0.6172	0.4325	0.2993	0.5050	0.6263	0.3226	0.2766	0.4110	0.5256	0.4082	0.3738	0.4339	0.4381	0.4707	0.3779	0.3908	0.3144	0.3275
LAML-kNN	0.6612	0.4559	0.3712	0.5519	0.7064	0.3115	0.2182	0.4295	0.5600	0.4118	0.3738	0.6722	0.4680	0.5425	0.4050	0.3895	0.3405	0.3201
RAKEL-O	0.6513	0.4392	0.2546	0.4714	0.6279	0.2903	0.2300	0.3878	0.5372	0.3884	0.3263	0.4752	0.4868	0.4781	0.3725	0.3834	0.2403	0.2785
RAKEL-D	0.6100	0.3871	0.2694	0.4583	0.5953	0.2930	0.2234	0.3764	0.5081	0.3857	0.3347	0.4634	0.4180	0.4649	0.3578	0.3432	0.2792	0.2922
LP	0.6339	0.4215	0.2839	0.4671	0.6202	0.3091	0.2240	0.3960	0.4991	0.3895	0.3605	0.5193	0.4417	0.4527	0.3416	0.3664	0.2739	0.2845
CLR	0.6248	0.3058	0.1620	0.3553	0.5160	0.1899	0.1220	0.2640	0.3965	0.2532	0.2319	0.2712	0.3869	0.3981	0.2567	0.2386	0.1656	0.1850
HOMER-B	0.6454	0.2459	0.1676	0.3204	0.4426	0.1688	0.0667	0.3155	0.3684	0.2503	0.2168	0.2841	0.3268	0.3901	0.2820	0.2081	0.1990	0.1858
HOMER-K	0.5925	0.2808	0.1499	0.3190	0.3957	0.1333	0.0357	0.3155	0.2672	0.2718	0.1945	0.2266	0.2738	0.3542	0.2061	0.1807	0.1024	0.1788
HOMER-R	0.6279	0.2346	0.1352	0.2947	0.3866	0.1541	0.0476	0.2507	0.2867	0.2543	0.1838	0.2665	0.2917	0.3195	0.2147	0.2004	0.1603	0.1735
ML-DT	0.6310	0.3925	0.2479	0.4375	0.6035	0.2784	0.1934	0.3561	0.5085	0.3706	0.3322	0.4265	0.4163	0.4457	0.3194	0.3343	0.2574	0.2660
ML-RF	0.6762	0.5933	0.3382	0.6264	0.7436	0.4550	0.3982	0.4539	0.6535	0.5091	0.5296	0.6495	0.5790	0.6165	0.4898	0.4934	0.3883	0.3996
DBR	0.6039	0.1187	0.0102	0.0445	0.0430	0.0134	0.0569	0.0127	0.0386	0.1905	0.0651	0.1185	0.2206	0.2891	0.2042	0.0513	0.1719	0.1953
STA	0.6165	0.4234	0.2909	0.4907	0.6254	0.3183	0.2385	0.3931	0.5034	0.3790	0.3497	0.4174	0.4448	0.4918	0.3765	0.3784	0.2877	0.3028
NS	0.6186	0.4275	0.3017	0.5127	0.6144	0.3254	0.2686	0.4052	0.5170	0.4048	0.3704	0.4370	0.4382	0.4739	0.3812	0.3864	0.3083	0.3162
ECC	0.6457	0.3678	0.1495	0.4227	0.5953	0.1891	0.1414	0.3003	0.4866	0.3100	0.2395	0.3538	0.4109	0.4506	0.3038	0.2651	0.1498	0.1788
IBLR-ML	0.6382	0.3299	0.0701	0.2716	0.5562	0.0092	0.0053	0.2399	0.4778	0.2927	0.0554	0.4983	0.2428	0.3748	0.0679	0.0710	0.0035	0.0070
IBLR-ML+	0.6980	0.5744	0.4868	0.7363	0.7851	0.4744	0.4703	0.5775	0.6444	0.5436	0.6107	0.7252	0.5851	0.6380	0.5573	0.5988	0.5046	0.5002
TSVM	0.2875	0.0341	0.0299	0.0312	0.0557	0.0530	0.0215	0.0620	0.0354	0.0552	0.0489	0.0531	0.1457	0.1311	0.0764	0.0457	0.0543	0.0610
TSCCM	0.2856	0.0349	0.0299	0.0309	0.0540	0.0542	0.0202	0.0626	0.0319	0.0612	0.0489	0.0531	0.1393	0.1350	0.0748	0.0452	0.0518	0.0570
TSPCCM	0.2653	0.0191	0.0203	0.0169	0.0333	0.0283	0.0155	0.0353	0.0189	0.0548	0.0331	0.0519	0.0730	0.0702	0.0373	0.0243	0.0375	0.0350
ML-TREE	0.6627	0.0061	0.0311	0.2373	0.0387	0.1389	0.0321	0.0600	0.5159	0.2740	0.0821	0.0346	0.1687	0.3924	0.1349	0.1657	0.0802	0.0820
MLRS	0.5985	0.4479	0.3358	0.5423	0.6277	0.2877	0.2528	0.4104	0.5644	0.3621	0.3512	0.6053	0.4070	0.4728	0.3440	0.3813	0.3077	0.2823
MLRS-LC	0.6279	0.4465	0.3318	0.5507	0.6431	0.2546	0.2463	0.4180	0.5631	0.3516	0.3524	0.5927	0.4536	0.5025	0.3574	0.3923	0.2985	0.2797
MLARAM	0.6722	0.5480	0.5418	0.6739	0.7581	0.4623	0.3924	0.5238	0.6455	0.5327	0.5288	0.7074	0.5646	0.5968	0.5208	0.5428	0.4599	0.4575
BRkNNa	0.6739	0.4800	0.3906	0.5276	0.7044	0.3127	0.2229	0.4230	0.5767	0.4255	0.3688	0.6610	0.4691	0.5389	0.4132	0.3964	0.3521	0.3261
BRkNNb	0.5642	0.1003	0.1064	0.1186	0.4534	0.1127	0.3153	0.1355	0.0554	0.2100	0.1460	0.1917	0.0717	0.0941	0.0540	0.0147	0.0283	0.0268

Table 14: Results on F1-micro for each method using sBERT

Dataset	BFRG-PT	CancerEmo	CBET	cedr	emotthreat	ExaAEC	GoEmotions	MLEC-AML English	MLEC-AML Indo	NLPCC2018	REDv2	semEval2007	semEval2018 arab	semEval2018 english	semEval2018 spanish	WRIME	XED-en	XED-fi
ML-kNN	0.5541	0.2685	0.4567	0.5148	0.5692	0.2951	0.1756	0.3348	0.3434	0.3526	0.3838	0.6108	0.3309	0.3964	0.2921	0.2999	0.3276	0.3053
BR	0.5211	0.2598	0.3174	0.4793	0.4841	0.2744	0.1537	0.3250	0.3281	0.3499	0.3590	0.3636	0.3378	0.3746	0.3003	0.2831	0.2648	0.2773
CC	0.5185	0.2568	0.2994	0.4490	0.4775	0.2574	0.1534	0.3195	0.3325	0.3359	0.3510	0.3571	0.3352	0.3667	0.2958	0.2731	0.2649	0.2759
LAML-kNN	0.5420	0.2448	0.4371	0.5285	0.5559	0.2892	0.1731	0.3375	0.3528	0.3369	0.3872	0.6030	0.3374	0.3977	0.2960	0.2953	0.3150	0.2990
RAKEL-O	0.5247	0.2325	0.3386	0.4772	0.4900	0.2760	0.1365	0.3096	0.3528	0.3282	0.3749	0.3861	0.3349	0.3762	0.2770	0.2786	0.2493	0.2771
RAKEL-D	0.5123	0.2300	0.2980	0.4426	0.4559	0.2516	0.1432	0.3053	0.3271	0.3320	0.3426	0.3590	0.3133	0.3548	0.2771	0.2569	0.2579	0.2657
LP	0.5084	0.2221	0.2838	0.4151	0.4472	0.2442	0.1055	0.2994	0.2985	0.3193	0.3392	0.3751	0.3167	0.3265	0.2285	0.2538	0.2328	0.2409
CLR	0.4806	0.1991	0.2551	0.4359	0.4429	0.2169	0.0924	0.2626	0.2845	0.2763	0.3117	0.2617	0.3021	0.3065	0.2193	0.2198	0.2036	0.2200
HOMER-B	0.5537	0.2186	0.2656	0.3726	0.4161	0.1556	0.0626	0.3208	0.3285	0.2715	0.2969	0.3121	0.2591	0.2813	0.1770	0.2228	0.2503	0.2403
HOMER-K	0.5047	0.1673	0.2403	0.3643	0.3686	0.1496	0.0423	0.3208	0.2234	0.2869	0.2637	0.2404	0.2606	0.3031	0.2069	0.1574	0.1307	0.2154
HOMER-R	0.5559	0.1805	0.2270	0.3528	0.3722	0.1735	0.0586	0.2794	0.2476	0.2761	0.2558	0.2681	0.2535	0.2899	0.1994	0.2177	0.2132	0.2263
ML-DT	0.5087	0.2072	0.2741	0.4028	0.4612	0.2299	0.1051	0.2798	0.3094	0.3093	0.3289	0.3390	0.3091	0.3259	0.2183	0.2356	0.2291	0.2382
ML-RF	0.4618	0.2402	0.4275	0.5742	0.5841	0.3302	0.1340	0.3120	0.3574	0.3398	0.4784	0.4483	0.3723	0.3931	0.2842	0.3251	0.3564	0.3654
DBR	0.4904	0.1031	0.0182	0.0792	0.0470	0.0358	0.0633	0.0204	0.0469	0.2140	0.1047	0.1721	0.1804	0.2273	0.1818	0.0536	0.1563	0.1714
STA	0.5212	0.2632	0.3222	0.4855	0.4885	0.2773	0.1556	0.3289	0.3384	0.3441	0.3633	0.3552	0.3361	0.3790	0.3010	0.2880	0.2674	0.2789
NS	0.5225	0.2484	0.3039	0.4569	0.4769	0.2654	0.1523	0.3199	0.3255	0.3378	0.3539	0.3575	0.3351	0.3701	0.2980	0.2761	0.2631	0.2679
ECC	0.4631	0.1860	0.2376	0.4667	0.4613	0.1947	0.0901	0.2543	0.2886	0.2511	0.2997	0.3600	0.3006	0.3306	0.2313	0.2134	0.1755	0.2033
IBLR-ML	0.3071	0.1393	0.1115	0.2491	0.2512	0.0076	0.0011	0.1336	0.1911	0.1377	0.0756	0.3460	0.1896	0.2210	0.0416	0.0518	0.0047	0.0093
IBLR-ML+	0.5506	0.3075	0.4703	0.6973	0.6450	0.4136	0.2906	0.4722	0.4455	0.4967	0.5699	0.6160	0.4198	0.4669	0.4546	0.4286	0.4370	0.4336
TSVM	0.3111	0.0576	0.0543	0.0546	0.1190	0.0792	0.0198	0.0905	0.0587	0.0903	0.0775	0.0955	0.1453	0.1373	0.0997	0.0696	0.0763	0.0829
TSCCM	0.3096	0.0546	0.0538	0.0536	0.1154	0.0777	0.0193	0.0890	0.0559	0.0998	0.0771	0.0994	0.1400	0.1445	0.0906	0.0694	0.0728	0.0780
TSPCCM	0.2865	0.0340	0.0354	0.0309	0.0691	0.0418	0.0196	0.0558	0.0358	0.0872	0.0521	0.0780	0.0779	0.0737	0.0520	0.0394	0.0514	0.0466
ML-TREE	0.4351	0.0157	0.0347	0.1673	0.0998	0.0518	0.0136	0.0679	0.1871	0.1652	0.0714	0.0690	0.0788	0.1696	0.0606	0.0815	0.0518	0.0557
MLRS	0.2797	0.2066	0.4308	0.5134	0.4298	0.2351	0.1609	0.3148	0.2963	0.2791	0.3705	0.4132	0.2771	0.2938	0.1852	0.2590	0.3132	0.2828
MLRS-LC	0.3459	0.2090	0.4245	0.5247	0.4753	0.1996	0.1553	0.3309	0.3010	0.2703	0.3713	0.4324	0.3180	0.3160	0.1969	0.2689	0.2986	0.2763
MLARAM	0.5329	0.3116	0.4845	0.5981	0.5885	0.3519	0.2286	0.3952	0.4163	0.4216	0.4612	0.6044	0.3732	0.4396	0.3442	0.3725	0.3620	0.3580
BRkNNa	0.5541	0.2685	0.4567	0.5045	0.5709	0.2951	0.1758	0.3348	0.3434	0.3526	0.3838	0.6108	0.3309	0.3964	0.2921	0.2999	0.3276	0.3053
BRkNNb	0.4460	0.0401	0.0221	0.0656	0.2119	0.0439	0.0195	0.0595	0.0168	0.1663	0.0508	0.1730	0.0443	0.0590	0.0258	0.0189	0.0276	0.0265