APPENDIX

Validation Results

Rank	Classifier	Embedding Model	Operator	AUC	MAP@5
1	LGBM	MP2	avg	0.842366	0.065144
2	LGBM	MP1	avg	0.867941	0.064438
3	LGBM	N1	avg	0.86557	0.064115
4	LGBM	N2	avg	0.83629	0.063995
5	LGBM	N1	hadamard	0.860167	0.061063
6	XGB	N1	avg	0.85034	0.060578
7	LGBM	MP2	hadamard	0.85298	0.060059
8	XGB	MP2	avg	0.833313	0.059653
9	LGBM	MP1	hadamard	0.859542	0.05955
10	XGB	MP1	hadamard	0.845396	0.059514
11	XGB	MP1	avg	0.851308	0.059469
12	XGB	N1	hadamard	0.844432	0.059295
13	XGB	MP1	l2	0.843222	0.059279
14	XGB	N1	l2	0.839112	0.059192
15	XGB	N2	avg	0.828527	0.059097
16	XGB	N2	hadamard	0.825707	0.05806
17	ANN	MP3	l2	0.858522	0.057942
18	XGB	MP2	hadamard	0.836183	0.057528
19	ANN	N3	l2	0.859616	0.057033
20	LGBM	N2	hadamard	0.844917	0.056921
21	ANN	MP1	hadamard	0.848236	0.056906
22	ANN	N1	hadamard	0.849119	0.056831
23	ANN	N1	avg	0.873278	0.056572
24	XGB	MP2	l2	0.852815	0.056424
25	XGB	N2	l2	0.846407	0.056317
26	LGBM	N1	l2	0.856985	0.056233
27	XGB	MP3	l2	0.844462	0.055673
28	ANN	MP4	l2	0.855041	0.055147
29	XGB	N3	l2	0.849336	0.055095
30	ANN	N4	l2	0.850823	0.054748
31	LGBM	N2	l2	0.862117	0.054171
32	ANN	MP2	avg	0.864014	0.053685
33	LGBM	MP2	l2	0.864245	0.053445
34	LGBM	MP1	l2	0.857637	0.053436
35	XGB	MP4	l2	0.847255	0.053172
36	ANN	MP2	l2	0.857006	0.052898
37	ANN	MP1	avg	0.869216	0.052412
38	XGB	N4	l2	0.840477	0.052278
39	ANN	MP2	hadamard	0.83607	0.051069
40	ANN	N2	l2	0.851234	0.050448
41	ANN	N2	avg	0.861046	0.049704
42	ANN	N2	hadamard	0.825901	0.049255
43	ANN	MP1	l2	0.842776	0.049232
44	ANN	N1	l2	0.841221	0.048963
45	LGBM	MP4	avg	0.851825	0.048614
46	LGBM	N3	avg	0.839608	0.048518
47	LGBM	MP3	avg	0.839772	0.048391
48	ANN	N4	avg	0.859196	0.047775

Validation experiment results part 1

Rank	Classifier	Embedding Model	Operator	AUC	MAP@5
49	ANN	MP3	avg	0.854452	0.046927
50	LGBM	N4	avg	0.847614	0.046913
51	ANN	MP4	avg	0.855556	0.046877
52	ANN	N3	avg	0.855993	0.046762
53	XGB	MP3	avg	0.831444	0.045798
54	XGB	MP4	avg	0.845583	0.045403
55	XGB	N3	hadamard	0.833318	0.04535
56	XGB	N3	avg	0.83273	0.044507
57	XGB	MP3	hadamard	0.830757	0.043149
58	XGB	MP4	hadamard	0.835488	0.042679
59	XGB	N4	hadamard	0.833846	0.041819
60	XGB	N4	avg	0.843175	0.041724
61	ANN	MP3	hadamard	0.831502	0.036346
62	ANN	N3	hadamard	0.832816	0.033939
63	ANN	MP4	hadamard	0.830758	0.03388
64	ANN	N4	hadamard	0.830609	0.032843
65	LGBM	N3	hadamard	0.841425	0.024693
66	LGBM	MP3	hadamard	0.830858	0.022915
67	LGBM	MP3	l2	0.828677	0.021685
68	LGBM	MP4	hadamard	0.823009	0.020958
69	LGBM	N4	hadamard	0.828977	0.019798
70	LGBM	N3	l2	0.832715	0.019147
71	LGBM	N4	l2	0.817684	0.018035
72	LGBM	MP4	l2	0.821527	0.017422

Validation experiment results part 2