Supplementary Material

1 Predicting Co-complex Edges

Method	Log Loss	Brier Score Loss	PR AUC
XGW	0.02744	0.006955	0.797384
SWC	0.085146	0.014308	0.39444
ALL	0.139878	0.026541	0.660414
TOPO_GO	0.140777	0.028024	0.712152
TOPO_GO_CO_EXP	0.168007	0.035798	0.677468
ASSOC	0.17164	0.042429	0.198766
GO_SS	0.180751	0.041467	0.658824
GO_CC	0.226645	0.05338	0.758071
TOPOS	0.229428	0.01683	0.32518
TOPO_CO_EXP	0.233329	0.0488	0.186731
CO_OCCUR	0.237458	0.01683	0.159465
TOPO	0.331643	0.018078	0.316941
GO_BP	0.375237	0.076654	0.148543
REL	0.48032	0.024176	0.142142
CO_EXP	0.566154	0.150734	0.044101
TOPO_L2	0.582889	0.026566	0.026484
STRING	0.665964	0.181944	0.301557
GO_MF	0.9611	0.046348	0.47878
UNWEIGHTED	7.098596	0.196944	0.302852

Table 1: Log loss, Brier score loss, and PR AUC in terms of co-complex edge classification of all the weighting methods for the Original composite network. This is the average over all the 10 cross-validation rounds.

Method	Log Loss	Brier Score Loss	PR AUC
XGW	0.040133	0.010696	0.770311
SWC	0.128472	0.022852	0.387718
TOPO_GO	0.14338	0.030899	0.694562
ALL	0.162951	0.034397	0.651494
TOPO_GO_CO_EXP	0.177856	0.040875	0.669927
GO_SS	0.188856	0.046512	0.663025
ASSOC	0.227489	0.060787	0.203106
GO_CC	0.231554	0.055402	0.796105
CO_OCCUR	0.346168	0.025149	0.161996
TOPO_CO_EXP	0.364348	0.057876	0.094823
GO_BP	0.434749	0.084665	0.170081
TOPOS	0.674619	0.025016	0.169141
REL	0.706276	0.034006	0.162623
CO_EXP	0.712146	0.179367	0.052318
TOPO	0.799929	0.025107	0.178668
TOPO_L2	0.84948	0.02905	0.062754
STRING	0.999322	0.276635	0.305434
GO_MF	1.314695	0.056948	0.490258
UNWEIGHTED	1.861188	0.051637	0.175425

Table 2: Log loss, Brier score loss, and PR AUC in terms of co-complex edge classification of all the weighting methods for the DIP composite network. This is the average over all the 10 cross-validation rounds.

2 Predicting Protein Complexes

Method	20k_050	all_050	20k_075	all_075	Average PR AUC
XGW	0.564289	0.395487	0.304114	0.16273	0.356655
SWC	0.467077	0.352057	0.17576	0.106091	0.275246
ALL	0.425446	0.137824	0.227692	0.032936	0.205975
TOPO	0.340094	0.208123	0.138871	0.058823	0.186478
GO_CC	0.408002	0.075122	0.200898	0.028458	0.17812
TOPO_GO	0.380295	0.123212	0.182184	0.02421	0.177475
REL	0.296588	0.223923	0.10697	0.056461	0.170986
TOPO_GO_CO_EXP	0.321996	0.117246	0.164866	0.032179	0.159072
ASSOC	0.327108	0.099619	0.11802	0.02172	0.141617
TOPOS	0.254049	0.123872	0.085706	0.012537	0.119041
GO_SS	0.203038	0.080125	0.107233	0.024593	0.103747
STRING	0.187432	0.032827	0.076521	0.00193	0.074678
CO_OCCUR	0.132089	0.096246	0.037926	0.024022	0.072571
TOPO_CO_EXP	0.107748	0.046919	0.013709	0.012419	0.045199
GO_BP	0.042128	0.028931	0.009631	0.003659	0.021087
GO_MF	0.017482	0.029251	0.004526	0.002482	0.013435
UNWEIGHTED	0.009751	0.009751	0.003186	0.003186	0.006469
CO_EXP	0.0	0.002516	0.0	0.000014	0.000632
TOPO_L2	0.000405	0.000344	0.0	0.0	0.000187

Table 3: PR AUC of all the weighting methods in terms of predicting protein complexes on the original composite network. This is the average over all the 10 cross-validation rounds and all the MCL inflation parameter settings.

Method	20k_050	all_050	20k_075	all_075	Average PR AUC
XGW	0.554903	0.408734	0.289238	0.175527	0.3571
SWC	0.424436	0.343329	0.164007	0.103815	0.258897
ALL	0.426124	0.162875	0.216814	0.032531	0.209586
REL	0.300828	0.245617	0.092446	0.076254	0.178786
GO_CC	0.356329	0.121791	0.200851	0.02053	0.174875
TOPO	0.252282	0.252282	0.076782	0.076782	0.164532
TOPO_GO_CO_EXP	0.309711	0.130596	0.14024	0.016769	0.149329
TOPO_GO	0.287989	0.137878	0.136231	0.019249	0.145337
ASSOC	0.323907	0.107954	0.116183	0.026464	0.143627
GO_SS	0.241409	0.109417	0.112664	0.016685	0.120044
TOPOS	0.179816	0.090441	0.034759	0.000378	0.076348
STRING	0.187012	0.032794	0.076369	0.00193	0.074526
CO_OCCUR	0.130482	0.096181	0.037492	0.024037	0.072048
UNWEIGHTED	0.094573	0.094573	0.02409	0.02409	0.059331
TOPO_CO_EXP	0.077152	0.035229	0.01718	0.00733	0.034223
GO_BP	0.058214	0.046297	0.017941	0.008684	0.032784
GO_MF	0.02551	0.041034	0.007128	0.007174	0.020211
TOPO_L2	0.009999	0.005127	0.000012	0.000003	0.003785
CO_EXP	0.0	0.001225	0.0	0.000006	0.000308

Table 4: PR AUC of all the weighting methods in terms of predicting protein complexes on the DIP composite network. This is the average over all the 10 cross-validation rounds and all the MCL inflation parameter settings.