

Supplementary Material: Path-based Extensions of Local Link Prediction Methods for Complex Networks

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Datasets	Method	CN	AA	RA	SO	SA	LHN	HP	HD
Karate	Qausi-local	6.15	4.05	4.72	2.54	2.93	2.26	5.03	2.11
	Global	5.8	4.07	4.76	2.45	2.88	2.18	4.92	1.99
US Roads	Qausi-local	-0.15	1.78	1.96	2.14	2.28	2.48	1.83	1.9
	Global	-0.2	2.06	2.28	2.45	2.61	2.86	2.07	2.16
Dolphin	Qausi-local	3.81	3.63	3.56	3.56	3.5	3.3	3.44	3.61
	Global	4.76	4.76	4.73	4.76	4.73	4.57	4.63	4.8
Bombing	Qausi-local	-0.1	0.5	0.74	0.58	0.64	0.68	0.66	0.53
	Global	-0.13	0.54	0.81	0.59	0.64	0.67	0.64	0.53
Neurons	Qausi-local	0.84	0.82	1.00	0.84	0.88	0.78	0.88	0.78
	Global	0.8	0.82	1.00	0.84	0.88	0.77	0.87	0.77
E.coli	Qausi-local	24.36	24.51	24.55	21.91	22.45	21.33	23.72	21.6
	Global	26.16	26.63	26.79	23.08	23.67	22.27	25.23	22.72
Net Science	Qausi-local	0.64	0.88	0.89	0.86	0.87	0.87	0.89	0.84
	Global	0.66	0.92	0.94	0.88	0.9	0.89	0.9	0.86
Infectious	Qausi-local	3.49	3.68	3.87	3.86	3.89	3.97	3.91	3.8
	Global	3.67	4.05	4.3	4.27	4.31	4.45	4.32	4.2
Metabolic	Qausi-local	3.34	2.24	2.45	1.76	2.19	1.4	2.89	1.38
	Global	3.3	2.27	2.48	1.76	2.21	1.4	2.9	1.37
US Air	Qausi-local	-0.01	0.37	0.59	0.24	0.35	0.18	0.41	0.21
	Global	-0.08	0.38	0.61	0.22	0.33	0.16	0.35	0.18
Email	Qausi-local	6.36	6.49	6.56	6.13	6.19	5.6	6.03	6.05
	Global	6.85	7.12	7.27	6.59	6.71	6.02	6.59	6.46
Yeast	Qausi-local	5.46	5.54	5.58	5.5	5.51	5.47	5.51	5.49
	Global	5.79	5.99	6.1	5.84	5.85	5.8	5.86	5.83

Table S1. The increase/decrease in performances of the quasi-local and global indices when compared to their respective local indices. We note that the difference is significant in some cases. For examples, for the E.coli dataset, the increase in accuracies is more than 20%. As discussed in the paper, this improvement in performance may be attributed to the topological properties of the network, in particular, the average clustering coefficient and the density of the network.

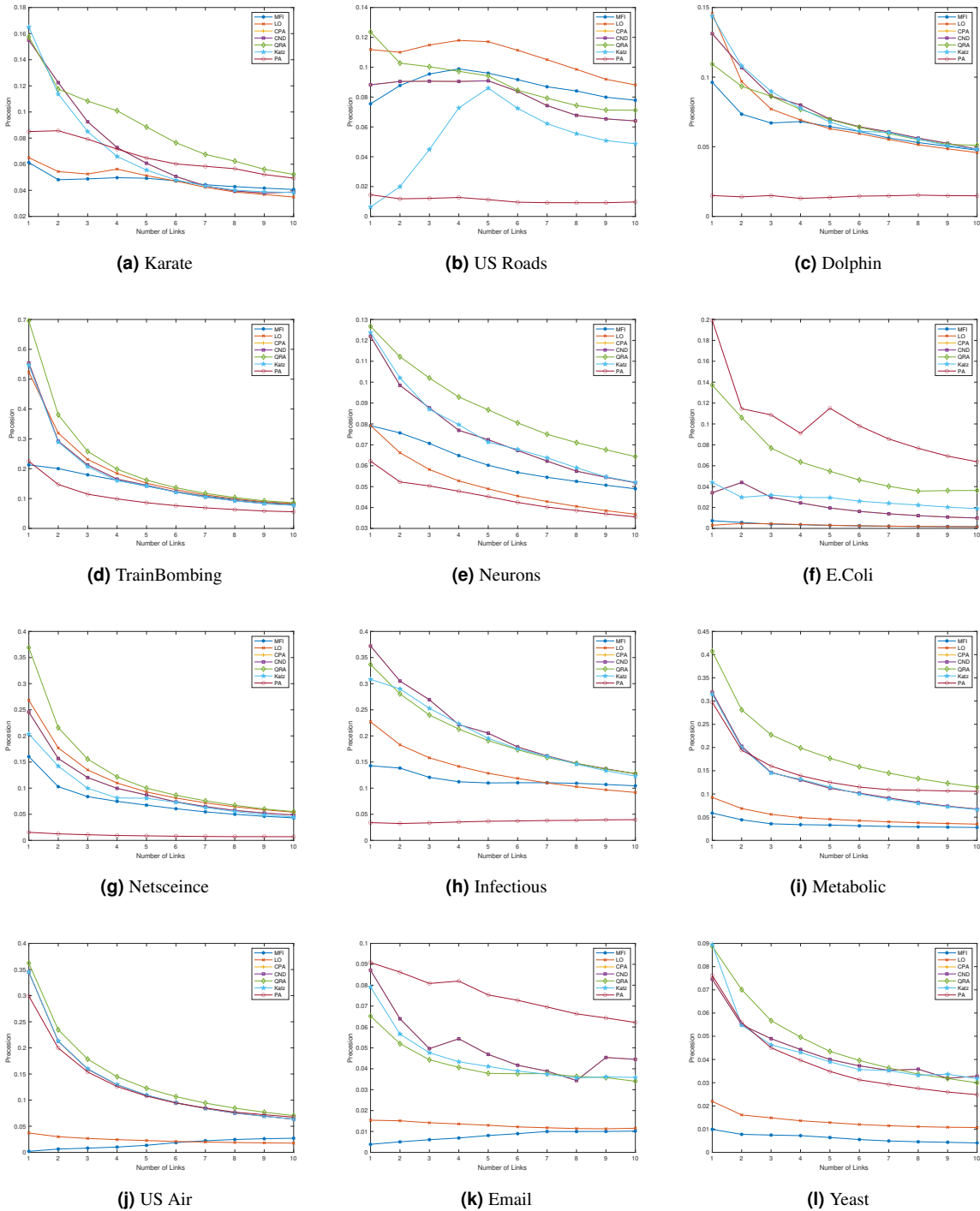


Figure S1. Accuracies of different methods as measured by Precision. To compute precision, the non-observed links are sorted in decreasing order. If L_r links are correctly predicted links among top L links, then the precision is defined as $Precision = \frac{L_r}{L}$. We note that the quasi-local extension of the resource allocation index give higher precision values on most dataset (and comparable performance on the other dataset).