

Clustering of Paths in Complex Networks

Supplementary Material*

Mareike Bockholt and Katharina A. Zweig

Table 1: Overview of the used data set. For each configuration, the size of the associated problem space is shown ($|V^c|$ and $|E^c|$ denote the number of nodes and edges of the problem space, $|V_{used}^c|$ denote the number of nodes which occur in at least one of the paths, % is the the percentage of used nodes), $\min |p|$ denotes the length of the optimal solution path. The remaining columns contain the information of how many paths are contained in the data set for each configuration and how many of them are solving and non-solving.

	Problem spaces				Paths $\min p $	Number of paths		
	$ V^c $	$ V_{used}^c $	%	$ E^c $		total	solving	non-solving
Game 19	1169	153	13.01	8620	31	662	213	449
Game 64	2952	354	12.00	21017	5	2934	2592	342
Game 121	4405	263	5.97	33302	47	270	39	231
Game 202	4635	171	3.69	38176	41	359	89	270
Game 246	3003	323	10.76	22418	33	552	158	394
Game 260	3095	203	6.56	24919	48	247	54	193
Game 326	3493	175	5.01	27529	50	290	48	242
Game 357	4426	99	2.24	37649	42	205	58	147
Game 393	4533	244	5.38	30587	49	175	53	122
Game 441	4533	238	5.25	30587	49	178	59	119
Game 578	2853	257	9.01	24732	31	904	230	674
Game 579	4573	189	4.13	35232	30	511	150	361
Game 674	6090	128	2.10	53537	44	306	90	216
Game 692	887	126	14.21	5226	46	404	89	315
Game 722	2241	144	6.43	14517	48	156	47	109
Game 723	830	181	21.81	7978	13	2704	1472	1232
Game 765	1327	182	13.72	10143	30	462	109	353
Game 820	7235	204	2.82	63551	41	212	44	168
Game 841	1050	128	12.19	5957	45	203	65	138
Game 906	864	226	26.16	6934	24	2013	520	1493

* These two tables are supplementary material for the article: Bockholt, M., Zweig, K. A. (2016). Clustering of Paths in Complex Networks. *Proceedings of the 5th International Workshop on Complex Networks and their Applications*, Milan, Italy. Springer.

Mareike Bockholt · Katharina A. Zweig
 Graph Theory and Complex Network Analysis Group, University of Kaiserslautern, Germany,
 {mareike.bockholt, zweig}@cs.uni-kl.de

Table 2: The weighted average purity for each of the six similarity measures for a fixed number of clusters. For each game, results for the unnormalized measure are presented in the first line, results for the normalized measure are presented in the second line. p_x denotes the weighted average purity of the clustering when choosing x clusters. For each game and each $x \in \{5, 10, 20, 30\}$ the highest p_x is highlighted. $q(\mathcal{P}_c)$ is denoted by q and gives the fraction of solving or non-solving paths of all paths for the configuration. All values are percentages.

	σ_{nss}				σ_{ess}				σ_{lcs}				δ_{mad}				$\delta_{comappa1}$				$\delta_{comappa2}$				q
	p_5	p_{10}	p_{20}	p_{30}	p_5	p_{10}	p_{20}	p_{30}	p_5	p_{10}	p_{20}	p_{30}	p_5	p_{10}	p_{20}	p_{30}	p_5	p_{10}	p_{20}	p_{30}	p_5	p_{10}	p_{20}	p_{30}	
Game 19	69	69	78	84	69	74	81	81	68	71	71	71	87	87	88	89	85	88	89	90	85	85	87	88	67.82
	79	79	84	84	68	68	81	84	84	84	84	85	84	86	89	89	85	85	92	94	92	96	96	96	
Game 64	89	89	89	89	88	88	88	90	89	89	89	89	89	90	90	94	89	90	90	97	89	90	97	97	88.34
	90	91	94	95	90	91	91	92	88	89	93	93	89	92	94	98	90	96	96	98	96	96	99	99	
Game 121	86	86	86	87	86	86	86	88	88	88	88	88	91	91	94	94	90	95	96	97	90	93	95	96	85.56
	87	90	91	92	86	86	89	89	86	89	89	91	88	90	95	95	95	95	95	96	95	95	96	97	
Game 202	76	81	92	92	77	81	96	96	76	76	95	95	89	93	95	95	95	96	100	100	99	99	100	100	75.21
	94	95	95	95	75	76	89	92	91	92	92	97	90	91	94	94	100	100	100	100	96	99	99	99	
Game 246	71	71	71	74	71	72	75	75	71	71	74	74	87	88	89	90	90	90	91	92	90	90	91	96	71.38
	82	87	89	89	72	84	86	87	78	89	89	89	88	88	89	89	90	90	92	93	93	96	97	97	
Game 260	78	92	92	92	78	79	92	92	78	89	92	92	87	93	95	96	93	93	96	98	93	93	100	100	78.14
	92	92	92	94	78	92	92	94	92	92	92	96	91	95	95	95	95	98	99	99	100	100	100	100	
Game 326	83	83	83	83	83	86	86	86	86	86	86	86	87	89	93	94	89	89	94	100	89	90	100	100	83.45
	84	84	86	90	83	83	89	90	85	87	92	95	85	91	91	92	96	99	100	100	100	100	100	100	
Game 357	72	82	82	87	75	75	81	81	74	81	82	85	90	91	95	95	99	99	100	100	93	98	99	99	71.71
	87	87	87	89	82	83	88	89	80	84	87	89	85	90	90	91	95	95	98	100	99	100	100	100	
Game 393	70	90	93	93	71	92	92	93	70	87	89	90	88	89	93	94	94	94	95	96	94	94	97	98	69.71
	86	86	93	94	70	83	90	91	88	88	93	94	87	90	91	91	94	97	98	98	94	97	98	99	
Game 441	67	90	90	90	67	73	84	84	67	88	88	89	90	93	95	96	88	97	99	99	88	97	97	97	66.85
	78	84	88	93	67	71	88	89	88	88	92	93	93	93	94	96	97	99	99	100	96	97	97	99	
Game 578	75	75	87	88	75	75	82	84	75	85	85	87	84	86	89	91	95	95	96	97	85	95	96	96	74.56
	82	85	87	88	75	75	86	88	80	84	87	88	91	92	92	93	94	94	97	97	90	97	98	99	
Game 579	71	89	89	89	82	82	82	83	71	71	71	85	85	89	90	91	94	94	94	96	99	99	99	99	70.65
	87	90	92	94	76	78	80	80	71	84	86	92	89	89	90	92	96	96	99	99	99	99	99	100	
Game 674	71	97	97	98	71	71	95	95	71	96	96	96	98	98	99	99	100	100	100	100	100	100	100	100	70.59
	92	92	98	98	71	92	93	95	97	97	98	98	98	98	98	99	93	99	99	99	100	100	100	100	
Game 692	78	78	86	86	78	78	89	89	78	78	85	85	92	92	94	95	90	93	97	97	93	100	100	100	77.97
	92	92	95	96	90	90	91	94	93	94	94	94	95	95	95	95	92	97	98	99	93	100	100	100	
Game 722	70	81	90	93	70	88	90	93	78	87	95	95	92	96	96	96	92	99	99	99	99	99	99	99	69.87
	88	90	96	96	82	96	97	97	82	92	94	96	95	97	97	97	99	99	99	99	99	99	99	99	
Game 723	55	56	66	74	55	57	58	63	55	57	65	79	95	95	96	96	99	99	99	99	99	99	99	99	54.44
	74	90	94	94	55	56	58	61	81	84	93	94	95	95	96	96	96	99	99	99	99	99	99	99	
Game 765	76	78	79	79	76	78	78	82	76	77	77	80	86	86	89	91	86	88	95	95	86	86	99	99	76.41
	77	80	85	85	76	76	79	86	78	79	84	86	84	89	91	91	82	90	96	96	87	94	98	99	
Game 820	79	81	92	93	79	89	91	91	79	91	94	94	92	92	95	96	90	100	100	100	100	100	100	100	79.25
	89	92	92	92	79	82	93	94	94	94	95	96	94	94	96	96	99	99	99	99	99	99	100	100	
Game 841	68	68	68	68	68	68	68	88	68	68	68	68	85	86	91	93	88	93	94	99	93	94	99	99	67.99
	86	86	90	91	68	85	90	93	68	88	93	94	80	87	89	90	96	97	100	100	94	98	99	99	
Game 906	74	76	93	93	74	74	76	92	74	74	85	85	95	95	96	97	99	99	99	99	97	97	97	100	74.17
	87	94	94	94	74	74	76	90	85	85	96	96	95	95	95	96	99	99	99	99	94	100	100	100	