

Supplementary 4

The words and their betweenness centrality scores in the co-occurrence analysis of DKE papers

Id	Label	Betweenness Centrality
812	database systems	0.117329227
857	artificial intelligence	0.080501422
1064	semantics	0.062062457
35	conceptual modeling	0.04252306
1013	knowledge representation	0.039486736
1085	algorithms	0.035870778
19	data mining	0.035202983
332	information retrieval	0.034335489
133	query processing	0.033978886
482	knowledge based systems	0.033554176
697	information management	0.03319382
422	optimization	0.032847367
355	natural language processing systems	0.029127839
600	query languages	0.02912754
182	ontology	0.025988288
974	classification (of information)	0.024653918
831	knowledge engineering	0.024356042
294	computational linguistics	0.023389643
284	data handling	0.022222488
96	indexing (of information)	0.021668719
400	computer simulation	0.021237447
802	data warehouses	0.02043855
1061	computer software	0.020081274
98	data structures	0.018758234
648	mathematical models	0.018310863
852	relational database systems	0.018120119
239	object oriented programming	0.017467204
1137	clustering algorithms	0.016492225
90	graph theory	0.016002237
1109	computational complexity	0.01443473
983	learning systems	0.01437465
431	constraint theory	0.014258978
296	xml	0.014126956
61	interoperability	0.014036532
114	data privacy	0.013617973
765	logic programming	0.013607595
135	formal logic	0.013338426
1146	decision making	0.013114286
371	forecasting	0.013083648
837	information systems	0.013025325
626	learning algorithms	0.012337479
275	computer aided software engineering	0.011127442
549	security of data	0.010862424
766	decision support systems	0.010805813
710	machine learning	0.010745984
478	websites	0.010150951
1123	problem solving	0.009931236
119	data processing	0.009876899
535	information services	0.009839866
702	software engineering	0.009726267
47	expert systems	0.009699568
973	trees (mathematics)	0.009416998
60	deductive databases	0.009338631

451	linguistics	0.008887287
376	feature extraction	0.00882954
305	data models	0.008235757
396	systems analysis	0.00811245
1138	clustering	0.008031584
823	world wide web	0.007962275
699	knowledge discovery	0.007622968
829	cluster analysis	0.007619431
728	text mining	0.007512287
502	management information systems	0.007421613
1082	distributed database systems	0.007179658
479	knowledge acquisition	0.007039748
524	data integration	0.006992295
241	graphic methods	0.006973599
884	automation	0.00678112
167	distributed computer systems	0.006699585
11	computer programming languages	0.006628638
1043	computer programming	0.006604738
53	object-oriented databases	0.006541314
902	conceptual model	0.006536109
253	efficiency	0.006283609
745	information retrieval systems	0.00626321
824	conceptual modelling	0.006182083
420	set theory	0.006103386
514	algebra	0.006064845
421	semantic web	0.006015114
336	information theory	0.00592132
1149	hierarchical systems	0.005875001
103	database design	0.00578644
613	computer architecture	0.00573415
796	data reduction	0.0056224
975	access control	0.005612586
360	user interfaces	0.005603852
706	business process	0.005449963
633	integrity constraints	0.00518791
536	relational databases	0.005151994
876	query optimization	0.005111462
145	adaptive systems	0.005022982
905	decision trees	0.004965602
555	data quality	0.004912017
483	natural language processing	0.004865874
559	apos;current	0.004739377
84	text processing	0.004545237
698	performance	0.004491455
196	heuristic methods	0.004376751
54	information analysis	0.004258304
786	data communication systems	0.004145513
460	abstracting	0.004105041
456	database management	0.004092897
1074	nearest neighbor search	0.004087244
790	information dissemination	0.003915846
449	mathematical transformations	0.003898474
384	data acquisition	0.003835116
590	relational database	0.003791683
624	schema integration	0.003642068
2	graphical user interfaces	0.003633858
787	search engines	0.003627429
525	analysis process	0.003619357

927	association rules	0.003562489
532	social networking (online)	0.003460338
0	design	0.003386914
1112	computer systems	0.003381947
494	approximation theory	0.003326919
80	computation theory	0.003200219
830	mapping	0.00297241
36	metadata	0.002821261
30	administrative data processing	0.002795509
563	optimisations	0.002794364
186	data storage equipment	0.002784696
1131	modeling languages	0.002639469
577	terminology	0.002626912
604	feature selection	0.002621574
498	requirements engineering	0.00260647
173	query language	0.002554584
59	data visualization	0.002527324
910	electronic commerce	0.002493989
801	formal languages	0.002472599
1038	mathematical operators	0.002460707
544	knowledge management	0.00245343
347	human computer interaction	0.00243092
898	computer networks	0.002399337
641	heuristic algorithms	0.002350992
944	data sets	0.002262316
768	integration	0.002238416
401	deductive database	0.002140194
193	long short term memory	0.002086388
491	ontology engineering	0.002079625
349	life cycle	0.002001243
320	entity relationship model	0.001995671
747	information use	0.001940426
273	concurrency control	0.001931574
757	computer hardware description languages	0.001912832
330	computer metatheory programming theory	0.001897197
928	semi structured data	0.001835113
542	syntactics	0.001834757
206	automata theory	0.001817331
752	drill down	0.00181468
756	extract transform loads	0.001811357
899	image database systems	0.001811357
892	servers	0.001785559
123	software design	0.0017764
913	fuzzy sets	0.001735918
1116	privacy preserving	0.001708828
818	data warehousing	0.001663014
277	information science	0.001607457
416	information technology	0.001598358
815	conceptual schema	0.001553273
62	digital storage	0.001548501
863	computer aided design	0.001546733
392	experimental evaluation	0.001542476
672	broadcasting	0.001481146
141	mining	0.001452661
607	active databases	0.001441017
261	state of the art	0.001377474
497	statistical methods	0.001370529
878	boolean functions	0.001352161

508	spatial databases	0.001341558
235	nearest neighbors	0.001340933
673	probability density function	0.001296506
516	response time (computer systems)	0.001289026
939	content based retrieval	0.001285828