

# Bibliography

- [1] <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide> 4
- [2] [http://ibts.hkbu.edu.hk/one\\_show.php/coid\\_3.htm](http://ibts.hkbu.edu.hk/one_show.php/coid_3.htm) 3
- [3] <https://www.facebook.com/notes/facebook-engineering/visualizing-friendships/469716398919> 3
- [4] F. Adu-Oppong, C. K. Gardiner, A. Kapadia, and P. P. Tsang. Social circles: Tackling privacy in social networks. In *Symposium on Usable Privacy and Security*. 3
- [5] S. Agrawal, S. Chaudhuri, and G. Das. Dbxplorer: A system for keyword-based search over relational databases. In *ICDE*, pages 5–16, 2002. DOI: [10.1109/icde.2002.994693](https://doi.org/10.1109/icde.2002.994693) 105
- [6] Y.-Y. Ahn, J. P. Bagrow, and S. Lehmann. Link communities reveal multiscale complexity in networks. *Nature*, 466(7307):761–764, 2010. DOI: [10.1038/nature09182](https://doi.org/10.1038/nature09182) 3, 4
- [7] E. M. Airoldi, D. M. Blei, S. E. Fienberg, and E. P. Xing. Mixed membership stochastic blockmodels. *Journal of Machine Learning Research*, 9(Sep):1981–2014, 2008. 130
- [8] E. Akbas and P. Zhao. Truss-based community search: A truss-equivalence based indexing approach. *PVLDB*, 10(11):1298–1309, 2017. DOI: [10.14778/3137628.3137640](https://doi.org/10.14778/3137628.3137640) 164
- [9] A. Anagnostopoulos, L. Becchetti, C. Castillo, A. Gionis, and S. Leonardi. Online team formation in social networks. In *WWW*, pages 839–848, 2012. DOI: [10.1145/2187836.2187950](https://doi.org/10.1145/2187836.2187950) 106
- [10] R. Andersen and K. Chellapilla. Finding dense subgraphs with size bounds. In *International Workshop on Algorithms and Models for the Web-Graph*, pages 25–37, 2009. DOI: [10.1007/978-3-540-95995-3\\_3](https://doi.org/10.1007/978-3-540-95995-3_3) 21, 22
- [11] R. Andersen, F. Chung, and K. Lang. Local graph partitioning using pagerank vectors. In *FOCS*, pages 475–486, 2006. DOI: [10.1109/focs.2006.44](https://doi.org/10.1109/focs.2006.44) 4
- [12] R. Andersen and K. J. Lang. Communities from seed sets. In *WWW*, pages 223–232, 2006. DOI: [10.1145/1135777.1135814](https://doi.org/10.1145/1135777.1135814) 4, 165

## 170 BIBLIOGRAPHY

- [13] M. Aritra. Distributed graph decomposition algorithms on apache spark. Ph.D. thesis, Purdue University, Indianapolis, 2018. [165](#)
- [14] L. Backstrom, D. P. Huttenlocher, J. M. Kleinberg, and X. Lan. Group formation in large social networks: Membership, growth, and evolution. In *KDD*, pages 44–54, 2006. [DOI: 10.1145/1150402.1150412](#) [111](#)
- [15] B. Bahmani, R. Kumar, and S. Vassilvitskii. Densest subgraph in streaming and mapreduce. *PVLDB*, 5(5):454–465, 2012. [DOI: 10.14778/2140436.2140442](#) [9](#), [20](#), [21](#), [166](#)
- [16] O. D. Balalau, F. Bonchi, T. Chan, F. Gullo, and M. Sozio. Finding subgraphs with maximum total density and limited overlap. In *WSDM*, pages 379–388, 2015. [DOI: 10.1145/2684822.2685298](#) [164](#)
- [17] B. Balasundaram, S. Butenko, and I. V. Hicks. Clique relaxations in social network analysis: The maximum k-plex problem. *Operations Research*, 2009. [DOI: 10.1287/opre.1100.0851](#) [135](#)
- [18] N. Barbieri, F. Bonchi, E. Galimberti, and F. Gullo. Efficient and effective community search. *DMKD*, 29(5):1406–1433, 2015. [DOI: 10.1007/s10618-015-0422-1](#) [7](#), [10](#), [27](#), [34](#), [39](#), [42](#), [43](#), [51](#), [78](#), [79](#), [80](#), [87](#), [167](#)
- [19] V. Batagelj and M. Zaversnik. An  $O(m)$  algorithm for cores decomposition of networks. *ArXiv Preprint cs/0310049*, 2003. [9](#), [10](#), [12](#), [17](#), [19](#), [20](#), [24](#), [25](#), [57](#), [94](#)
- [20] V. Batagelj and M. Zaveršnik. Short cycle connectivity. *Discrete Mathematics*, 307(3–5):310–318, 2007. [DOI: 10.1016/j.disc.2005.09.051](#) [52](#)
- [21] N. Beckmann, H.-P. Kriegel, R. Schneider, and B. Seeger. The  $R^*$ -tree: An efficient and robust access method for points and rectangles. In *ACM SIGMOD Record*, vol. 19, pages 322–331, 1990. [DOI: 10.1145/93605.98741](#) [140](#)
- [22] G. Bhalotia, A. Hulgeri, C. Nakhe, S. Chakrabarti, and S. Sudarshan. Keyword searching and browsing in databases using banks. In *ICDE*, pages 431–440, 2002. [DOI: 10.1109/icde.2002.994756](#) [105](#), [106](#)
- [23] F. Bi, L. Chang, X. Lin, and W. Zhang. An optimal and progressive approach to online search of top-k influential communities. *PVLDB*, 11(9):1056–1068, 2018. [DOI: 10.14778/3213880.3213881](#) [163](#)
- [24] Y. Bian, J. Ni, W. Cheng, and X. Zhang. Many heads are better than one: Local community detection by the multi-walker chain. In *ICDM*, pages 21–30, 2017. [DOI: 10.1109/icdm.2017.11](#) [165](#)

- [25] Y. Bian, Y. Yan, W. Cheng, W. Wang, D. Luo, and X. Zhang. On multi-query local community detection. In *ICDM*, pages 9–18, 2018. DOI: [10.1109/icdm.2018.00016](https://doi.org/10.1109/icdm.2018.00016)
- [26] P. Boldi, M. Rosa, and S. Vigna. HyperANF: Approximating the neighbourhood function of very large graphs on a budget. In *WWW*, pages 625–634, 2011. DOI: [10.1145/1963405.1963493](https://doi.org/10.1145/1963405.1963493)
- [27] F. Bonchi, F. Gullo, A. Kaltenbrunner, and Y. Volkovich. Core decomposition of uncertain graphs. In *KDD*, pages 1316–1325, 2014. DOI: [10.1145/2623330.2623655](https://doi.org/10.1145/2623330.2623655)
- [28] C. Borgs, M. Brautbar, J. Chayes, and B. Lucier. Maximizing social influence in nearly optimal time. In *SODA*, pages 946–957, 2014. DOI: [10.1137/1.9781611973402.70](https://doi.org/10.1137/1.9781611973402.70)
- [29] E. Boros and P. L. Hammer. Pseudo-Boolean optimization. *Discrete Applied Mathematics*, 123(1–3):155–225, 2002. DOI: [10.1016/s0166-218x\(01\)00341-9](https://doi.org/10.1016/s0166-218x(01)00341-9)
- [30] C. Bothorel, J. D. Cruz, M. Magnani, and B. Micenkova. Clustering attributed graphs: Models, measures and methods. *Network Science*, 3(03):408–444, 2015. DOI: [10.1017/nws.2015.9](https://doi.org/10.1017/nws.2015.9)
- [31] C. Bron and J. Kerbosch. Finding all cliques of an undirected graph (algorithm 457). *Communications of the ACM*, 16(9):575–576, 1973. 9, 10, 12, 13, 24
- [32] R. S. Burt. Social contagion and innovation: Cohesion versus structural equivalence. *American Journal of Sociology*, 92(6):1287–1335, 1987. DOI: [10.1086/228667](https://doi.org/10.1086/228667)
- [33] L. Cai, T. Meng, T. He, L. Chen, and Z. Deng. K-hop community search based on local distance dynamics. In *International Conference on Neural Information Processing*, pages 24–34, 2017. DOI: [10.1007/978-3-319-70139-4\\_3](https://doi.org/10.1007/978-3-319-70139-4_3)
- [34] B. Cao, N. N. Liu, and Q. Yang. Transfer learning for collective link prediction in multiple heterogenous domains. In *ICML*, pages 159–166, 2010. 4
- [35] L. Chang, W. Li, L. Qin, W. Zhang, and S. Yang. pSCAN: Fast and exact structural graph clustering. *IEEE Transactions on Knowledge and Data Engineering*, 29(2):387–401, 2017. DOI: [10.1109/icde.2016.7498245](https://doi.org/10.1109/icde.2016.7498245)
- [36] L. Chang, X. Lin, L. Qin, J. X. Yu, and W. Zhang. Index-based optimal algorithms for computing Steiner components with maximum connectivity. In *SIGMOD*, pages 459–474, 2015. DOI: [10.1145/2723372.2746486](https://doi.org/10.1145/2723372.2746486)
- [37] L. Chang and L. Qin. *Cohesive Subgraph Computation over Large Sparse Graphs: Algorithms, Data Structures, and Programming Techniques*. Springer, 2018. DOI: [10.1007/978-3-030-03599-0](https://doi.org/10.1007/978-3-030-03599-0)

## 172 BIBLIOGRAPHY

- [38] L. Chang, J. X. Yu, L. Qin, X. Lin, C. Liu, and W. Liang. Efficiently computing k-edge connected components via graph decomposition. In *SIGMOD*, pages 205–216, 2013. DOI: [10.1145/2463676.2465323](https://doi.org/10.1145/2463676.2465323) 9, 22, 23, 24, 25
- [39] M. Charikar. Greedy approximation algorithms for finding dense components in a graph. In *International Workshop on Approximation Algorithms for Combinatorial Optimization*, pages 84–95, 2000. DOI: [10.1007/3-540-44436-x\\_10](https://doi.org/10.1007/3-540-44436-x_10) 21
- [40] J. Chen and Y. Saad. Dense subgraph extraction with application to community detection. *IEEE Transactions on Knowledge and Data Engineering*, 24(7):1216–1230, 2012. DOI: [10.1109/tkde.2010.271](https://doi.org/10.1109/tkde.2010.271) 20
- [41] L. Chen, C. Liu, R. Zhou, J. Li, X. Yang, and B. Wang. Maximum co-located community search in large scale social networks. *PVLDB*, 11(9), 2018. DOI: [10.14778/3231751.3231755](https://doi.org/10.14778/3231751.3231755) 164
- [42] W. Chen, L. V. Lakshmanan, and C. Castillo. Information and influence propagation in social networks. *Synthesis Lectures on Data Management*, 5(4):1–177, 2013. DOI: [10.2200/s00527ed1v01y201308dtm037](https://doi.org/10.2200/s00527ed1v01y201308dtm037) 2, 43
- [43] H. Cheng, Y. Zhou, X. Huang, and J. X. Yu. Clustering large attributed information networks: An efficient incremental computing approach. *DMKD*, 25(3):450–477, 2012. DOI: [10.1007/s10618-012-0263-0](https://doi.org/10.1007/s10618-012-0263-0) 107
- [44] J. Cheng, Y. Ke, S. Chu, and M. T. Özsü. Efficient core decomposition in massive networks. In *ICDE*, pages 51–62, 2011. DOI: [10.1109/icde.2011.5767911](https://doi.org/10.1109/icde.2011.5767911) 9, 10, 12, 17, 20, 166
- [45] J. Cheng, Y. Ke, A. W.-C. Fu, J. X. Yu, and L. Zhu. Finding maximal cliques in massive networks by  $H^*$ -graph. In *SIGMOD*, pages 447–458, 2010. DOI: [10.1145/1807167.1807217](https://doi.org/10.1145/1807167.1807217) 9, 12, 13
- [46] X.-Q. Cheng and H.-W. Shen. Uncovering the community structure associated with the diffusion dynamics on networks. *Journal of Statistical Mechanics: Theory and Experiment*, 2010(04):P04024, 2010. DOI: [10.1088/1742-5468/2010/04/p04024](https://doi.org/10.1088/1742-5468/2010/04/p04024) 4
- [47] N. Chiba and T. Nishizeki. Arboricity and subgraph listing algorithms. *SIAM Journal on Computing*, 14(1):210–223, 1985. DOI: [10.1137/0214017](https://doi.org/10.1137/0214017) 60, 122
- [48] F. Chierichetti, A. Epasto, R. Kumar, S. Lattanzi, and V. Mirrokni. Efficient algorithms for public-private social networks. In *KDD*, pages 139–148, 2015. DOI: [10.1145/2783258.2783354](https://doi.org/10.1145/2783258.2783354) 157, 166
- [49] E. Cohen. Size-estimation framework with applications to transitive closure and reachability. *JCSS*, 55(3):441–453, 1997. DOI: [10.1006/jcss.1997.1534](https://doi.org/10.1006/jcss.1997.1534) 72, 166

- [50] J. Cohen. Trusses: Cohesive subgraphs for social network analysis. *Technical Report*, National Security Agency, 2008. [9](#), [10](#), [12](#), [18](#), [19](#), [20](#), [52](#), [54](#), [55](#), [67](#), [94](#)
- [51] J. Cohen. Graph twiddling in a MapReduce world. *Computing in Science and Engineering*, 11(4):29–41, 2009. [DOI: 10.1109/mcse.2009.120](#) [20](#)
- [52] A. Conte, T. De Matteis, D. De Sensi, R. Grossi, A. Marino, and L. Versari. D2K: Scalable community detection in massive networks via small-diameter k-plexes. In *KDD*, pages 1272–1281, 2018. [DOI: 10.1145/3219819.3220093](#) [164](#)
- [53] T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein. *Introduction to Algorithms*. MIT Press, 2009. [DOI: 10.2307/2583667](#) [113](#), [115](#), [116](#)
- [54] W. Cui, Y. Xiao, H. Wang, Y. Lu, and W. Wang. Online search of overlapping communities. In *SIGMOD*, pages 277–288, 2013. [DOI: 10.1145/2463676.2463722](#) [2](#), [4](#), [5](#), [7](#), [27](#), [30](#), [31](#), [32](#), [34](#), [54](#), [55](#), [63](#), [65](#), [78](#), [79](#), [80](#), [85](#), [105](#), [159](#)
- [55] W. Cui, Y. Xiao, H. Wang, and W. Wang. Local search of communities in large graphs. In *SIGMOD*, pages 991–1002, 2014. [7](#), [10](#), [27](#), [34](#), [38](#), [39](#), [51](#), [78](#), [79](#), [80](#), [85](#), [87](#), [159](#)  
[DOI: 10.1145/2588555.2612179](#)
- [56] M. Danisch, O. Balalau, and M. Sozio. Listing k-cliques in sparse real-world graphs. In *WWW*, pages 589–598, 2018. [DOI: 10.1145/3178876.3186125](#) [24](#), [25](#)
- [57] R. Dey, Z. Jelveh, and K. Ross. Facebook users have become much more private: A large-scale study. In *IEEE International Conference on Pervasive Computing and Communications Workshops*, pages 346–352, 2012. [DOI: 10.1109/percomw.2012.6197508](#) [166](#)
- [58] B. Ding, J. X. Yu, S. Wang, L. Qin, X. Zhang, and X. Lin. Finding top-k min-cost connected trees in databases. In *ICDE*, pages 836–845, 2007. [DOI: 10.1109/icde.2007.367929](#) [105](#)
- [59] P. S. Dodds and D. J. Watts. Universal behavior in a generalized model of contagion. *Physical Review Letters*, 92:218701, 2004. [DOI: 10.1103/physrevlett.92.218701](#) [111](#)
- [60] N. Durak, A. Pinar, T. G. Kolda, and C. Seshadhri. Degree relations of triangles in real-world networks and graph models. In *CIKM*, pages 1712–1716, 2012. [DOI: 10.1145/2396761.2398503](#) [52](#)
- [61] J. Edachery, A. Sen, and F. J. Brandenburg. Graph clustering using distance-k cliques. In *Proc. of the 7th International Symposium on Graph Drawing*, pages 98–106, 1999. [DOI: 10.1007/3-540-46648-7\\_10](#) [9](#), [55](#)
- [62] J. Elzinga and D. W. Hearn. Geometrical solutions for some minimax location problems. *Transportation Science*, 6(4):379–394, 1972. [DOI: 10.1287/trsc.6.4.379](#) [149](#)

## 174 BIBLIOGRAPHY

- [63] M. Fang, N. Shivakumar, H. Garcia-Molina, R. Motwani, and J. D. Ullman. Computing iceberg queries efficiently. In *VLDB*, 1999. [112](#)
- [64] Y. Fang, R. Cheng, X. Li, S. Luo, and J. Hu. Effective community search over large spatial graphs. *PVLDB*, 10(6):709–720, 2017. [DOI: 10.14778/3055330.3055337](#) [10](#), [131](#), [133](#), [147](#), [148](#), [149](#), [156](#), [157](#)
- [65] Y. Fang, R. Cheng, S. Luo, and J. Hu. Effective community search for large attributed graphs. *PVLDB*, 9(12):1233–1244, 2016. [DOI: 10.14778/2994509.2994538](#) [5](#), [7](#), [10](#), [83](#), [87](#), [89](#), [91](#), [103](#), [105](#), [127](#), [164](#), [167](#)
- [66] Y. Fang, R. Cheng, S. Luo, J. Hu, and K. Huang. C-explorer: Browsing communities in large graphs. *PVLDB*, 10(12):1885–1888, 2017. [DOI: 10.14778/3137765.3137800](#) [159](#)
- [67] Y. Fang, Z. Wang, R. Cheng, X. Li, S. Luo, J. Hu, and X. Chen. On spatial-aware community search. *IEEE Transactions on Knowledge and Data Engineering*, 2018. [DOI: 10.1109/tkde.2018.2845414](#) [152](#)
- [68] S. Fortunato. Community detection in graphs. *Physics Reports*, 486(3–5):75–174, 2010. [DOI: 10.1016/j.physrep.2009.11.002](#) [3](#), [4](#), [165](#)
- [69] H. N. Gabow and R. E. Tarjan. A linear-time algorithm for a special case of disjoint set union. In *STOC*, pages 246–251, 1983. [DOI: 10.1145/800061.808753](#) [42](#)
- [70] A. Gajewar and A. D. Sarma. Multi-skill collaborative teams based on densest subgraphs. In *SDM*, pages 165–176, 2012. [DOI: 10.1137/1.9781611972825.15](#) [105](#), [106](#)
- [71] G. Gallo, M. D. Grigoriadis, and R. E. Tarjan. A fast parametric maximum flow algorithm and applications. *SIAM Journal on Computing*, 18(1):30–55, 1989. [DOI: 10.1137/0218003](#) [4](#), [165](#)
- [72] M. R. Garey and D. S. Johnson. *Computers and Intractability: A Guide to the Theory of NP-Completeness*. W. H. Freeman, 1979. [DOI: 10.1137/1024022](#) [55](#), [67](#)
- [73] D. Gibson, J. Kleinberg, and P. Raghavan. Inferring web communities from link topology. In *Proc. of the 9th ACM Conference on Hypertext and Hypermedia: Links, Objects, Time and Space—Structure in Hypermedia Systems: Links, Objects, Time and Space—Structure in Hypermedia Systems*, pages 225–234, 1998. [DOI: 10.1145/276627.276652](#) [4](#)
- [74] D. Gibson, R. Kumar, and A. Tomkins. Discovering large dense subgraphs in massive graphs. In *VLDB*, pages 721–732, 2005. [24](#)
- [75] A. Goyal, F. Bonchi, and L. V. Lakshmanan. Learning influence probabilities in social networks. In *WSDM*, pages 241–250, 2010. [DOI: 10.1145/1718487.1718518](#) [43](#)

- [76] S. Günnemann, B. Boden, and T. Seidl. DB-CSC: A density-based approach for subspace clustering in graphs with feature vectors. In *ECML/PKDD*, pages 565–580, 2011. [DOI: 10.1007/978-3-642-23780-5\\_46](https://doi.org/10.1007/978-3-642-23780-5_46) 107
- [77] J. Han, M. Kamber, and J. Pei. *Data Mining: Concepts and Techniques*, (3rd ed.). Morgan Kaufmann Publishers Inc., San Francisco, CA. 2011. 92
- [78] J. Han, J. Pei, and Y. Yin. Mining frequent patterns without candidate generation. In *ACM SIGMOD Record*, vol. 29, pages 1–12, 2000. [DOI: 10.1145/335191.335372](https://doi.org/10.1145/335191.335372) 92
- [79] M. S. Handcock, A. E. Raftery, and J. M. Tantrum. Model-based clustering for social networks. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 170(2):301–354, 2007. [DOI: 10.1111/j.1467-985x.2007.00471.x](https://doi.org/10.1111/j.1467-985x.2007.00471.x) 130
- [80] S. Harenberg, R. G. Seay, S. Ranshous, K. Padmanabhan, J. K. Harlalka, E. R. Schendel, M. P. O’Brien, R. Y. Chirkova, W. Hendrix, A. N. Choudhary, et al. Memory-efficient query-driven community detection with application to complex disease associations. In *SDM*, pages 1010–1018, 2014. [DOI: 10.1137/1.9781611973440.115](https://doi.org/10.1137/1.9781611973440.115) 165
- [81] E. Hartuv and R. Shamir. A clustering algorithm based on graph connectivity. *Information Processing Letters*, 76(4–6):175–181, 2000. [DOI: 10.1016/s0020-0190\(00\)00142-3](https://doi.org/10.1016/s0020-0190(00)00142-3) 9, 55
- [82] A. Hollocou, T. Bonald, and M. Lelarge. Multiple local community detection. *ACM SIGMETRICS Performance Evaluation Review*, 45(2):76–83, 2018. [DOI: 10.1145/3199524.3199537](https://doi.org/10.1145/3199524.3199537) 164
- [83] V. Hristidis, L. Gravano, and Y. Papakonstantinou. Efficient IR-style keyword search over relational databases. In *PVLDB*, pages 850–861, 2003. [DOI: 10.1016/b978-012722442-8/50080-x](https://doi.org/10.1016/b978-012722442-8/50080-x) 105, 106
- [84] V. Hristidis and Y. Papakonstantinou. Discover: Keyword search in relational databases. In *PVLDB*, pages 670–681, 2002. [DOI: 10.1016/B978-155860869-6/50065-2](https://doi.org/10.1016/B978-155860869-6/50065-2) 105, 106
- [85] A. L. Hu and K. C. Chan. Utilizing both topological and attribute information for protein complex identification in PPI networks. *TCBB*, 10(3):780–792, 2013. [DOI: 10.1109/tcbb.2013.37](https://doi.org/10.1109/tcbb.2013.37) 84, 85, 103, 154
- [86] J. Hu, X. Wu, R. Cheng, S. Luo, and Y. Fang. On minimal steiner maximum-connected subgraph queries. *IEEE Transactions on Knowledge and Data Engineering*, 29(11):2455–2469, 2017. [DOI: 10.1109/tkde.2017.2730873](https://doi.org/10.1109/tkde.2017.2730873) 164
- [87] X. Huang, H. Cheng, R.-H. Li, L. Qin, and J. X. Yu. Top-k structural diversity search in large networks. *PVLDB*, 6(13):1618–1629, 2013. [DOI: 10.14778/2536258.2536272](https://doi.org/10.14778/2536258.2536272) 5, 7, 109, 112, 118, 123

## 176 BIBLIOGRAPHY

- [88] X. Huang, H. Cheng, R.-H. Li, L. Qin, and J. X. Yu. Top-k structural diversity search in large networks. *The VLDB Journal*, 24(3):319–343, 2015. DOI: 10.14778/2536258.2536272 5, 109, 111, 112, 118, 123, 124
- [89] X. Huang, H. Cheng, L. Qin, W. Tian, and J. X. Yu. Querying k-truss community in large and dynamic graphs. In *SIGMOD*, pages 1311–1322, 2014. DOI: 10.1145/2588555.2610495 3, 4, 5, 7, 10, 20, 27, 52, 58, 67, 78, 79, 80, 98, 99, 159, 164, 166, 167
- [90] X. Huang, H. Cheng, and J. X. Yu. Dense community detection in multi-valued attributed networks. *Information Sciences*, 314:77–99, 2015. DOI: 10.1016/j.ins.2015.03.075 107, 165
- [91] X. Huang, H. Cheng, and J. X. Yu. Attributed community analysis: Global and ego-centric views. *IEEE Data Engineering Bulletin*, 39(3):29–40, 2016. 164
- [92] X. Huang, J. Jiang, B. Choi, J. Xu, Z. Zhang, and Y. Song. PP-DBLP: Modeling and generating attributed public-private networks with DBLP. In *IEEE International Conference on Data Mining Workshops (ICDMW)*, pages 986–989, 2018. DOI: 10.1109/icdmw.2018.00142 157
- [93] X. Huang and L. V. Lakshmanan. Attribute-driven community search. *PVLDB*, 10(9):949–960, 2017. DOI: 10.14778/3099622.3099626 1, 5, 7, 10, 83, 85, 94, 97, 102, 104, 127, 164
- [94] X. Huang, L. V. Lakshmanan, and J. Xu. Community search over big graphs: Models, algorithms, and opportunities. In *ICDE*, pages 1451–1454, IEEE, 2017. DOI: 10.1109/icde.2017.211 8
- [95] X. Huang, L. V. Lakshmanan, and J. Xu. Tutorial slides: Community search over big graphs: Models, algorithms, and opportunities. [http://www.comp.hkbu.edu.hk/~xi\\_nhuang/publications/pdfs/ICDE-Tutorial17-April19.ppt](http://www.comp.hkbu.edu.hk/~xi_nhuang/publications/pdfs/ICDE-Tutorial17-April19.ppt), 2017. 3, 8
- [96] X. Huang, L. V. Lakshmanan, J. X. Yu, and H. Cheng. Approximate closest community search in networks. *PVLDB*, 9(4):276–287, 2015. DOI: 10.14778/2856318.2856323 2, 5, 7, 10, 27, 52, 65, 72, 78, 79, 80, 85, 87, 94, 105, 167
- [97] X. Huang, L. V. Lakshmanan, J. X. Yu, and H. Cheng. Approximate closest community search in networks. *ArXiv Preprint ArXiv:1505.05956*, 2015. DOI: 10.14778/2856318.2856323 72
- [98] X. Huang, W. Lu, and L. V. S. Lakshmanan. Truss decomposition of probabilistic graphs: Semantics and algorithms. In *SIGMOD*, pages 77–90, 2016. DOI: 10.1145/2882903.2882913 165, 166

- [99] S. Jabbour, N. Mhadhbi, B. Radaoui, and L. Sais. Triangle-driven community detection in large graphs using propositional satisfiability. In *AINA*, pages 437–444, 2018. [DOI: 10.1109/aina.2018.00072](https://doi.org/10.1109/aina.2018.00072) 165
- [100] M. Jalili, Y. Orouskhani, M. Asgari, N. Alipourfard, and M. Perc. Link prediction in multiplex online social networks. *Royal Society Open Science*, 4(2):160863, 2017. [DOI: 10.1098/rsos.160863](https://doi.org/10.1098/rsos.160863) 4
- [101] Y. Jiang, X. Huang, H. Cheng, and J. X. Yu. VizCS: Online searching and visualizing communities in dynamic graphs. In *ICDE*, 2018. [DOI: 10.1109/icde.2018.00182](https://doi.org/10.1109/icde.2018.00182) 159
- [102] V. Kacholia, S. Pandit, S. Chakrabarti, S. Sudarshan, R. Desai, and H. Karambelkar. Bidirectional expansion for keyword search on graph databases. In *VLDB*, pages 505–516, 2005. [105](#), [106](#)
- [103] M. Kargar and A. An. Discovering top-k teams of experts with/without a leader in social networks. In *CIKM*, pages 985–994, 2011. [DOI: 10.1145/2063576.2063718](https://doi.org/10.1145/2063576.2063718) [105](#), [106](#)
- [104] A. M. Katunka, C. Yan, K. B. Serge, and Z. Zhang. K-truss based top-communities search in large graphs. In *International Conference on Advanced Cloud and Big Data*, pages 244–249, IEEE, 2017. [DOI: 10.1109/cbd.2017.49](https://doi.org/10.1109/cbd.2017.49) 164
- [105] D. Kempe, J. Kleinberg, and É. Tardos. Maximizing the spread of influence through a social network. In *KDD*, pages 137–146, 2003. [DOI: 10.1145/956750.956769](https://doi.org/10.1145/956750.956769) [43](#), [44](#), [111](#)
- [106] S. Khuller and B. Saha. On finding dense subgraphs. In *ICALP*, pages 597–608, 2009. [DOI: 10.1007/978-3-642-02927-1\\_50](https://doi.org/10.1007/978-3-642-02927-1_50) [9](#), [21](#)
- [107] G. Kortsarz and D. Peleg. Generating sparse 2-spanners. *Journal of Algorithms*, 17(2):222–236, 1994. [DOI: 10.1007/3-540-55706-7\\_7](https://doi.org/10.1007/3-540-55706-7_7) [21](#)
- [108] L. Kou, G. Markowsky, and L. Berman. A fast algorithm for Steiner trees. *Acta Informatica*, 15(2):141–145, 1981. [DOI: 10.1007/bf00288961](https://doi.org/10.1007/bf00288961) [43](#)
- [109] L.-Y. Kuo, C.-K. Chou, and M.-S. Chen. Query-oriented graph clustering. In *PAKDD*, pages 749–761, 2017. [DOI: 10.1007/978-3-319-57529-2\\_58](https://doi.org/10.1007/978-3-319-57529-2_58) [165](#)
- [110] H. Kwak, C. Lee, H. Park, and S. B. Moon. What is twitter, a social network or a news media? In *WWW*, pages 591–600, 2010. [DOI: 10.1145/1772690.1772751](https://doi.org/10.1145/1772690.1772751) [110](#)
- [111] K. Lang and S. Rao. A flow-based method for improving the expansion or conductance of graph cuts. In *International Conference on Integer Programming and Combinatorial Optimization*, pages 325–337, 2004. [DOI: 10.1007/978-3-540-25960-2\\_25](https://doi.org/10.1007/978-3-540-25960-2_25) [4](#), [165](#)

## 178 BIBLIOGRAPHY

- [112] T. Lappas, K. Liu, and E. Terzi. Finding a team of experts in social networks. In *KDD*, pages 467–476, 2009. DOI: [10.1145/1557019.1557074](https://doi.org/10.1145/1557019.1557074) 105, 106
- [113] E. L. Lawler. *Combinatorial Optimization: Networks and Matroids*. Courier Corporation, 1976. 21
- [114] P. Lee and L. V. Lakshmanan. Query-driven maximum quasi-clique search. In *SDM*, pages 522–530, 2016. DOI: [10.1137/1.9781611974348.59](https://doi.org/10.1137/1.9781611974348.59) 163
- [115] C. Lei and J. Ruan. A novel link prediction algorithm for reconstructing protein—protein interaction networks by topological similarity. *Bioinformatics*, 29(3):355–364, 2012. DOI: [10.1093/bioinformatics/bts688](https://doi.org/10.1093/bioinformatics/bts688) 4
- [116] J. Leskovec and A. Krevl. SNAP Datasets: Stanford large network dataset collection. <http://snap.stanford.edu/data>, June 2014. 153, 154, 155, 156, 157
- [117] J. Leskovec and J. J. Mcauley. Learning to discover social circles in ego networks. In *NIPS*, pages 539–547, 2012. 4, 5, 7, 109, 110, 127, 128, 130, 155, 156, 159, 160
- [118] C.-T. Li and M.-K. Shan. Team formation for generalized tasks in expertise social networks. In *IEEE International Conference on Social Computing*, pages 9–16, 2010. DOI: [10.1109/socialcom.2010.12](https://doi.org/10.1109/socialcom.2010.12) 106
- [119] G. Li, B. C. Ooi, J. Feng, J. Wang, and L. Zhou. Ease: An effective 3-in-1 keyword search method for unstructured, semi-structured and structured data. In *SIGMOD*, pages 903–914, 2008. DOI: [10.1145/1376616.1376706](https://doi.org/10.1145/1376616.1376706) 105, 106
- [120] J. Li, X. Wang, K. Deng, X. Yang, T. Sellis, and J. X. Yu. Most influential community search over large social networks. In *ICDE*, pages 871–882, 2017. DOI: [10.1109/icde.2017.136](https://doi.org/10.1109/icde.2017.136) 43, 163
- [121] R.-H. Li, L. Qin, F. Ye, J. X. Yu, X. Xiao, N. Xiao, and Z. Zheng. Skyline community search in multi-valued networks. In *SIGMOD*, pages 457–472, 2018. DOI: [10.1145/3183713.3183736](https://doi.org/10.1145/3183713.3183736) 163
- [122] R.-H. Li, L. Qin, J. X. Yu, and R. Mao. Influential community search in large networks. *PVLDB*, 8(5), 2015. DOI: [10.14778/2735479.2735484](https://doi.org/10.14778/2735479.2735484) 5, 7, 10, 27, 35, 43, 44, 45, 50, 51, 78, 79, 80, 85, 87, 163
- [123] Y. Li, R. Chen, J. Xu, Q. Huang, H. Hu, and B. Choi. Geo-social k-cover group queries for collaborative spatial computing. *IEEE Transactions on Knowledge and Data Engineering*, 27(10):2729–2742, 2015. DOI: [10.1109/icde.2016.7498399](https://doi.org/10.1109/icde.2016.7498399) 7, 131, 133, 143, 145, 146

- [124] Y. Li, R. Chen, J. Xu, Q. Huang, H. Hu, and B. Choi. Geo-social k-cover group queries for collaborative spatial computing. In *ICDE*, pages 1510–1511, 2016. DOI: [10.1109/icde.2016.7498399](https://doi.org/10.1109/icde.2016.7498399) 7, 10, 133, 143
- [125] Y. Li, C. Sha, X. Huang, and Y. Zhang. Community detection in attributed graphs: An embedding approach. In *AAAI*, 2018. 4
- [126] Y. Li, Y. Zhao, G. Wang, F. Zhu, Y. Wu, and S. Shi. Effective k-vertex connected component detection in large-scale networks. In *International Conference on Database Systems for Advanced Applications*, pages 404–421, 2017. DOI: [10.1007/978-3-319-55699-4\\_25](https://doi.org/10.1007/978-3-319-55699-4_25) 22
- [127] B. Lucier, J. Oren, and Y. Singer. Influence at scale: Distributed computation of complex contagion in networks. In *KDD*, pages 735–744, 2015. DOI: [10.1145/2783258.2783334](https://doi.org/10.1145/2783258.2783334) 43
- [128] D. J. MacKay and D. J. Mac Kay. *Information Theory, Inference and Learning Algorithms*. Cambridge University Press, 2003. DOI: [10.1108/03684920410534506](https://doi.org/10.1108/03684920410534506) 129
- [129] A. Majumder, S. Datta, and K. Naidu. Capacitated team formation problem on social networks. In *KDD*, pages 1005–1013, 2012. DOI: [10.1145/2339530.2339690](https://doi.org/10.1145/2339530.2339690) 106
- [130] G. Malewicz, M. H. Austern, A. J. Bik, J. C. Dehnert, I. Horn, N. Leiser, and G. Czajkowski. Pregel: A system for large-scale graph processing. In *SIGMOD*, pages 135–146, 2010. DOI: [10.1145/1807167.1807184](https://doi.org/10.1145/1807167.1807184) 166
- [131] K. Mehlhorn. A faster approximation algorithm for the steiner problem in graphs. *Information Processing Letters*, 27(3):125–128, 1988. DOI: [10.1016/0020-0190\(88\)90066-x](https://doi.org/10.1016/0020-0190(88)90066-x) 78, 79
- [132] R. J. Mokken. Cliques, clubs and clans. *Quality and Quantity*, 13(2):161–173, 1979. DOI: [10.1007/bf00139635](https://doi.org/10.1007/bf00139635) 9, 10, 12, 14, 15
- [133] M. E. Newman. Finding community structure in networks using the eigenvectors of matrices. *Physical Review E*, 74(3):036104, 2006. DOI: [10.1103/physreve.74.036104](https://doi.org/10.1103/physreve.74.036104) 4
- [134] M. E. Newman. Spectral methods for community detection and graph partitioning. *Physical Review E*, 88(4):042822, 2013. DOI: [10.1103/physreve.88.042822](https://doi.org/10.1103/physreve.88.042822) 4
- [135] M. E. Newman and M. Girvan. Finding and evaluating community structure in networks. *Physical Review E*, 69(2):026113, 2004. DOI: [10.1103/physreve.69.026113](https://doi.org/10.1103/physreve.69.026113) 4, 165
- [136] M. E. Newman, D. J. Watts, and S. H. Strogatz. Random graph models of social networks. *PNAS*, 99(suppl 1):2566–2572, 2002. DOI: [10.1073/pnas.012582999](https://doi.org/10.1073/pnas.012582999) 52

## 180 BIBLIOGRAPHY

- [137] J.-P. Onnela, A. Chakraborti, K. Kaski, J. Kertesz, and A. Kanto. Dynamics of market correlations: Taxonomy and portfolio analysis. *Physical Review E*, 68(5):056110, 2003. DOI: [10.1103/physreve.68.056110](https://doi.org/10.1103/physreve.68.056110) 2
- [138] L. Page, S. Brin, R. Motwani, and T. Winograd. The pagerank citation ranking: Bringing order to the Web. *Technical Report*, Stanford InfoLab, 1999. 44
- [139] G. Palla, I. Derényi, I. Farkas, and T. Vicsek. Uncovering the overlapping community structure of complex networks in nature and society. *Nature*, 435(7043):814–818, 2005. DOI: [10.1038/nature03607](https://doi.org/10.1038/nature03607) 1, 2, 3, 4, 27, 28, 29, 78
- [140] R. Pastor-Satorras and A. Vespignani. Epidemic spreading in scale-free networks. *Physical Review Letters*, 86(14):3200, 2001. DOI: [10.1103/physrevlett.86.3200](https://doi.org/10.1103/physrevlett.86.3200) 111
- [141] L. Qin, J. X. Yu, L. Chang, and Y. Tao. Querying communities in relational databases. In *ICDE*, pages 724–735, 2009. DOI: [10.1109/icde.2009.67](https://doi.org/10.1109/icde.2009.67) 106
- [142] E. Ravasz, A. L. Somera, D. A. Mongru, Z. N. Oltvai, and A.-L. Barabási. Hierarchical organization of modularity in metabolic networks. *Science*, 297(5586):1551–1555, 2002. DOI: [10.1126/science.1073374](https://doi.org/10.1126/science.1073374) 2
- [143] D. M. Romero, B. Meeder, and J. M. Kleinberg. Differences in the mechanics of information diffusion across topics: Idioms, political hashtags, and complex contagion on twitter. In *WWW*, pages 695–704, 2011. DOI: [10.1145/1963405.1963503](https://doi.org/10.1145/1963405.1963503) 111
- [144] M. Rosvall and C. T. Bergstrom. Maps of random walks on complex networks reveal community structure. *PNAS*, 105(4):1118–1123, 2008. DOI: [10.1073/pnas.0706851105](https://doi.org/10.1073/pnas.0706851105) 4
- [145] C. Rother, V. Kolmogorov, V. Lempitsky, and M. Szummer. Optimizing binary MRFS via extended roof duality. In *CVPR*, pages 1–8, 2007. DOI: [10.1109/cvpr.2007.383203](https://doi.org/10.1109/cvpr.2007.383203) 130
- [146] Y. Ruan, D. Fuhry, and S. Parthasarathy. Efficient community detection in large networks using content and links. In *WWW*, pages 1089–1098, 2013. DOI: [10.1145/2488388.2488483](https://doi.org/10.1145/2488388.2488483) 107
- [147] N. Ruchansky, F. Bonchi, D. García-Soriano, F. Gullo, and N. Kourtellis. The minimum Wiener connector problem. In *SIGMOD*, pages 1587–1602, 2015. DOI: [10.1145/2723372.2749449](https://doi.org/10.1145/2723372.2749449) 164
- [148] Y. Saad. *Iterative Methods for Sparse Linear Systems*, vol. 82, SIAM, 2003. DOI: [10.1137/1.9780898718003](https://doi.org/10.1137/1.9780898718003) 73

- [149] S. E. Schaeffer. Graph clustering. *Computer Science Review*, 1(1):27–64, 2007. DOI: [10.1016/j.cosrev.2007.05.001](https://doi.org/10.1016/j.cosrev.2007.05.001) 77, 78
- [150] J. Scott. *Social Network Analysis*. Sage, 2017. DOI: [10.1177/0038038588022001007](https://doi.org/10.1177/0038038588022001007) 2
- [151] J. Shan, D. Shen, T. Nie, Y. Kou, and G. Yu. An efficient approach of overlapping communities search. In *International Conference on Database Systems for Advanced Applications*, pages 374–388, 2015. DOI: [10.1007/978-3-319-18120-2\\_22](https://doi.org/10.1007/978-3-319-18120-2_22) 163
- [152] J. Shan, D. Shen, T. Nie, Y. Kou, and G. Yu. Searching overlapping communities for group query. *World Wide Web*, 19(6):1179–1202, 2016. DOI: [10.1007/s11280-015-0378-5](https://doi.org/10.1007/s11280-015-0378-5) 163
- [153] J. Shang, C. Wang, C. Wang, G. Guo, and J. Qian. An attribute-based community search method with graph refining. *The Journal of Supercomputing*, pages 1–28, 2017. DOI: [10.1007/s11227-017-1976-z](https://doi.org/10.1007/s11227-017-1976-z) 165
- [154] H. Shen, X. Cheng, K. Cai, and M.-B. Hu. Detect overlapping and hierarchical community structure in networks. *Physica A: Statistical Mechanics and its Applications*, 388(8):1706–1712, 2009. DOI: [10.1016/j.physa.2008.12.021](https://doi.org/10.1016/j.physa.2008.12.021) 4
- [155] J. Shi and J. Malik. Normalized cuts and image segmentation. *Departmental Papers (CIS)*, page 107, 2000. DOI: [10.1109/cvpr.1997.609407](https://doi.org/10.1109/cvpr.1997.609407) 4, 165
- [156] S. Soundarajan and J. Hopcroft. Using community information to improve the precision of link prediction methods. In *WWW*, pages 607–608, 2012. DOI: [10.1145/2187980.2188150](https://doi.org/10.1145/2187980.2188150) 4
- [157] M. Sozio and A. Gionis. The community-search problem and how to plan a successful cocktail party. In *KDD*, pages 939–948, 2010. DOI: [10.1145/1835804.1835923](https://doi.org/10.1145/1835804.1835923) 5, 7, 10, 27, 34, 35, 36, 38, 51, 78, 79, 80, 85, 87, 105, 149
- [158] V. Spirin and L. A. Mirny. Protein complexes and functional modules in molecular networks. *PNAS*, 100(21):12123–12128, 2003. DOI: [10.1073/pnas.2032324100](https://doi.org/10.1073/pnas.2032324100) 2
- [159] Y. Sun and J. Han. Mining heterogeneous information networks: A structural analysis approach. *ACM SIGKDD Explorations Newsletter*, 14(2):20–28, 2013. DOI: [10.1145/2481244.2481248](https://doi.org/10.1145/2481244.2481248) 2, 165
- [160] Y. Sun, J. Tang, J. Han, M. Gupta, and B. Zhao. Community evolution detection in dynamic heterogeneous information networks. In *Proc. of the 8th Workshop on Mining and Learning with Graphs*, pages 137–146, 2010. DOI: [10.1145/1830252.1830270](https://doi.org/10.1145/1830252.1830270) 166

## 182 BIBLIOGRAPHY

- [161] S. A. Tabrizi, A. Shakery, M. Asadpour, M. Abbasi, and M. A. Tavallaie. Personalized pagerank clustering: A graph clustering algorithm based on random walks. *Physica A: Statistical Mechanics and its Applications*, 392(22):5772–5785, 2013. DOI: [10.1016/j.physa.2013.07.021](https://doi.org/10.1016/j.physa.2013.07.021) 4, 165
- [162] C. E. Tsourakakis, F. Bonchi, A. Gionis, F. Gullo, and M. A. Tsialti. Denser than the densest subgraph: Extracting optimal quasi-cliques with quality guarantees. In *KDD*, pages 104–112, 2013. DOI: [10.1145/2487575.2487645](https://doi.org/10.1145/2487575.2487645) 9, 10, 12, 13, 15
- [163] J. Ugander, L. Backstrom, C. Marlow, and J. Kleinberg. Structural diversity in social contagion. *PNAS*, 109(16):5962–5966, 2012. DOI: [10.1073/pnas.1116502109](https://doi.org/10.1073/pnas.1116502109) 7, 109, 111, 122
- [164] J. C. Valverde-Rebaza and A. de Andrade Lopes. Link prediction in complex networks based on cluster information. In *Brazilian Symposium on Artificial Intelligence*, pages 92–101, 2012. DOI: [10.1007/978-3-642-34459-6\\_10](https://doi.org/10.1007/978-3-642-34459-6_10) 4
- [165] J. Wang and J. Cheng. Truss decomposition in massive networks. *PVLDB*, 5(9):812–823, 2012. DOI: [10.14778/2311906.2311909](https://doi.org/10.14778/2311906.2311909) 9, 10, 12, 15, 18, 19, 20, 24, 25, 52, 54, 55, 56, 80, 99, 100, 166
- [166] J. Wang, J. Cheng, and A. W.-C. Fu. Redundancy-aware maximal cliques. In *KDD*, pages 122–130, 2013. DOI: [10.1145/2487575.2487689](https://doi.org/10.1145/2487575.2487689) 9, 12, 13
- [167] M. Wang, W. Zuo, and Y. Wang. An improved density peaks-based clustering method for social circle discovery in social networks. *Neurocomputing*, 179:219–227, 2016. DOI: [10.1016/j.neucom.2015.11.091](https://doi.org/10.1016/j.neucom.2015.11.091) 156
- [168] N. Wang, J. Zhang, K.-L. Tan, and A. K. H. Tung. On triangulation-based dense neighborhood graphs discovery. *PVLDB*, 4(2):58–68, 2010. DOI: [10.14778/1921071.1921073](https://doi.org/10.14778/1921071.1921073) 12, 23
- [169] Y. Wang, J. Fang, and F. Wu. Application of community detection algorithm with link clustering in inhibition of social network worms. *IJ Network Security*, 19(3):458–468, 2017. 4
- [170] Y. Wang and L. Gao. An edge-based clustering algorithm to detect social circles in ego networks. *Journal of Computers*, 8(10):2575–2582, 2013. DOI: [10.4304/jcp.8.10.2575-2582](https://doi.org/10.4304/jcp.8.10.2575-2582) 7, 109, 127
- [171] Y. Wang, X. Jian, Z. Yang, and J. Li. Query optimal k-plex based community in graphs. *Data Science and Engineering*, 2(4):257–273, 2017. DOI: [10.1007/s41019-017-0051-3](https://doi.org/10.1007/s41019-017-0051-3) 164

- [172] Z. Wang, Y. Yuan, G. Wang, H. Qin, and Y. Ma. An effective method for community search in large directed attributed graphs. In *International Conference on Mobile ad hoc and Sensor Networks*, pages 237–251, 2017. DOI: [10.1007/978-981-10-8890-2\\_17](https://doi.org/10.1007/978-981-10-8890-2_17) 164
- [173] T. Waskiewicz. Friend of a friend influence in terrorist social networks. In *ICAI*, page 1, 2012. 4
- [174] S. Wasserman and K. Faust. *Social Network Analysis: Methods and Applications*, vol. 8. Cambridge University Press, 1994. DOI: [10.1017/cbo9780511815478](https://doi.org/10.1017/cbo9780511815478) 52
- [175] D. J. Watts and P. S. Dodds. Influentials, networks, and public opinion formation. *Journal of Consumer Research*, 34:441–458, 2007. DOI: [10.1086/518527](https://doi.org/10.1086/518527) 111
- [176] D. J. Watts, P. S. Dodds, and M. E. Newman. Identity and search in social networks. *Science*, 296(5571):1302–1305, 2002. DOI: [10.1126/science.1070120](https://doi.org/10.1126/science.1070120) 2
- [177] D. J. Watts and S. H. Strogatz. Collective dynamics of small-world’networks. *Nature*, 393(6684):440, 1998. DOI: [10.1038/9781400841356.301](https://doi.org/10.1038/9781400841356.301) 52
- [178] D. Wen, L. Qin, X. Lin, Y. Zhang, and L. Chang. Enumerating k-vertex connected components in large graphs. *ArXiv Preprint ArXiv:1703.08668*, 2017. DOI: [10.1109/icde.2019.00014](https://doi.org/10.1109/icde.2019.00014) 22, 23
- [179] D. Wen, L. Qin, Y. Zhang, X. Lin, and J. X. Yu. I/O efficient core graph decomposition at web scale. In *ICDE*, pages 133–144, 2016. DOI: [10.1109/icde.2016.7498235](https://doi.org/10.1109/icde.2016.7498235) 166
- [180] Y. Wu, R. Jin, J. Li, and X. Zhang. Robust local community detection: On free rider effect and its elimination. *PVLDB*, 8(7), 2015. DOI: [10.14778/2752939.2752948](https://doi.org/10.14778/2752939.2752948) 5, 7, 27, 73, 74, 75, 76, 77, 78, 79, 80, 81, 87, 154, 160
- [181] Z. Wu, S. Pan, F. Chen, G. Long, C. Zhang, and P. S. Yu. A comprehensive survey on graph neural networks. *ArXiv Preprint ArXiv:1901.00596*, 2019. 165
- [182] J. Xiang, C. Guo, and A. Aboulnaga. Scalable maximum clique computation using MapReduce. In *ICDE*, pages 74–85, 2013. DOI: [10.1109/icde.2013.6544815](https://doi.org/10.1109/icde.2013.6544815) 9, 12, 13
- [183] J. Xie, S. Kelley, and B. K. Szymanski. Overlapping community detection in networks: The state-of-the-art and comparative study. *ACM Computing Survey*, 45(4):43, 2013. DOI: [10.1145/2501654.2501657](https://doi.org/10.1145/2501654.2501657) 4
- [184] J. Xu, X. Fu, L. Tu, M. Luo, M. Xu, and N. Zheng. Personalized top-n influential community search over large social networks. In *APWeb-WAIM*, pages 105–120, 2018. DOI: [10.1007/978-3-319-96890-2\\_9](https://doi.org/10.1007/978-3-319-96890-2_9) 43, 163

## 184 BIBLIOGRAPHY

- [185] D. Yan, J. Cheng, Y. Lu, and W. Ng. Blogel: A block-centric framework for distributed computation on real-world graphs. *PVLDB*, 7(14):1981–1992, 2014. DOI: [10.14778/2733085.2733103](https://doi.org/10.14778/2733085.2733103) 166
- [186] Y. Yan, D. Luo, J. Ni, H. Fei, W. Fan, X. Yu, J. Yen, and X. Zhang. Local graph clustering by multi-network random walk with restart. In *PAKDD*, pages 490–501, 2018. DOI: [10.1007/978-3-319-93040-4\\_39](https://doi.org/10.1007/978-3-319-93040-4_39) 165
- [187] J. Yang and J. Leskovec. Overlapping community detection at scale: A non-negative matrix factorization approach. In *WSDM*, pages 587–596, 2013. DOI: [10.1145/2433396.2433471](https://doi.org/10.1145/2433396.2433471) 4, 165
- [188] J. Yang and J. Leskovec. Overlapping communities explain core—periphery organization of networks. *Proc. of the IEEE*, 102(12):1892–1902, 2014. DOI: [10.1109/jproc.2014.2364018](https://doi.org/10.1109/jproc.2014.2364018) 4, 165
- [189] H. Yin, A. R. Benson, J. Leskovec, and D. F. Gleich. Local higher-order graph clustering. In *KDD*, pages 555–564, 2017. DOI: [10.1145/3097983.3098069](https://doi.org/10.1145/3097983.3098069) 164
- [190] F. Zhang, L. Yuan, Y. Zhang, L. Qin, X. Lin, and A. Zhou. Discovering strong communities with user engagement and tie strength. In *International Conference on Database Systems for Advanced Applications*, pages 425–441, 2018. DOI: [10.1007/978-3-319-91452-7\\_28](https://doi.org/10.1007/978-3-319-91452-7_28) 163
- [191] G. Zhang, D. Jin, J. Gao, P. Jiao, F. Fogelman-Soulie, and X. Huang. Finding communities with hierarchical semantics by distinguishing general and specialized topics. In *IJCAI*, pages 3648–3654, 2018. DOI: [10.24963/ijcai.2018/507](https://doi.org/10.24963/ijcai.2018/507) 4, 165
- [192] Y. Zhang and S. Parthasarathy. Extracting analyzing and visualizing triangle k-core motifs within networks. In *ICDE*, pages 1049–1060, 2012. DOI: [10.1109/icde.2012.35](https://doi.org/10.1109/icde.2012.35) 12, 20
- [193] Z. Zhang, P. Cui, and W. Zhu. Deep learning on graphs: A survey. *ArXiv Preprint ArXiv:1812.04202*, 2018. 4, 165
- [194] Z. Zhang, X. Huang, J. Xu, B. Choi, and Z. Shang. Keyword centric community search. In *ICDE*, pages 422–433, 2019. DOI: [10.1109/icde.2019.00045](https://doi.org/10.1109/icde.2019.00045) 164
- [195] D. Zheng, J. Liu, R.-H. Li, C. Aslay, Y.-C. Chen, and X. Huang. Querying intimate-core groups in weighted graphs. In *IEEE International Conference on Semantic Computing*, pages 156–163, 2017. DOI: [10.1109/icsc.2017.80](https://doi.org/10.1109/icsc.2017.80) 163
- [196] Z. Zheng, F. Ye, R.-H. Li, G. Ling, and T. Jin. Finding weighted k-truss communities in large networks. *Information Sciences*, 417:344–360, 2017. DOI: [10.1016/j.ins.2017.07.012](https://doi.org/10.1016/j.ins.2017.07.012) 164

- [197] R. Zhou, C. Liu, J. X. Yu, W. Liang, B. Chen, and J. Li. Finding maximal k-edge-connected subgraphs from a large graph. In *EDBT*, pages 480–491, 2012. DOI: [10.1145/2247596.2247652](https://doi.org/10.1145/2247596.2247652) 22
- [198] Y. Zhou, H. Cheng, and J. X. Yu. Graph clustering based on structural/attribute similarities. *PVLDB*, 2(1):718–729, 2009. DOI: [10.14778/1687627.1687709](https://doi.org/10.14778/1687627.1687709) 84, 107
- [199] Q. Zhu, H. Hu, C. Xu, J. Xu, and W.-C. Lee. Geo-social group queries with minimum acquaintance constraints. *The VLDB Journal*, 26(5):709–727, 2017. DOI: [10.1007/s00778-017-0473-6](https://doi.org/10.1007/s00778-017-0473-6) 3, 7, 10, 133, 135, 136, 138, 143, 156, 157
- [200] Z. Zou and R. Zhu. Truss decomposition of uncertain graphs. *Knowledge and Information Systems*, 50(1):197–230, 2017. DOI: [10.1007/s10115-016-0943-y](https://doi.org/10.1007/s10115-016-0943-y) 165