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DEPARTMENT OF
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Efficient Graph Search Algorithms for Public-Private Social Networks

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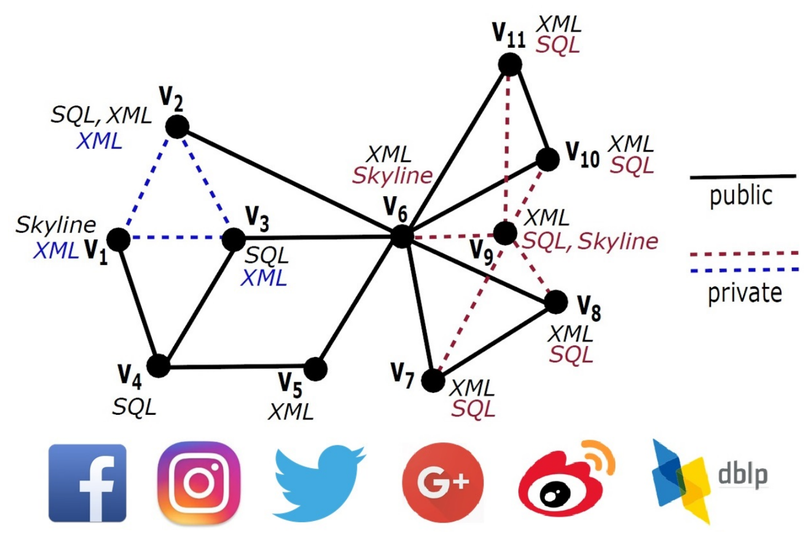
OBJECTIVES

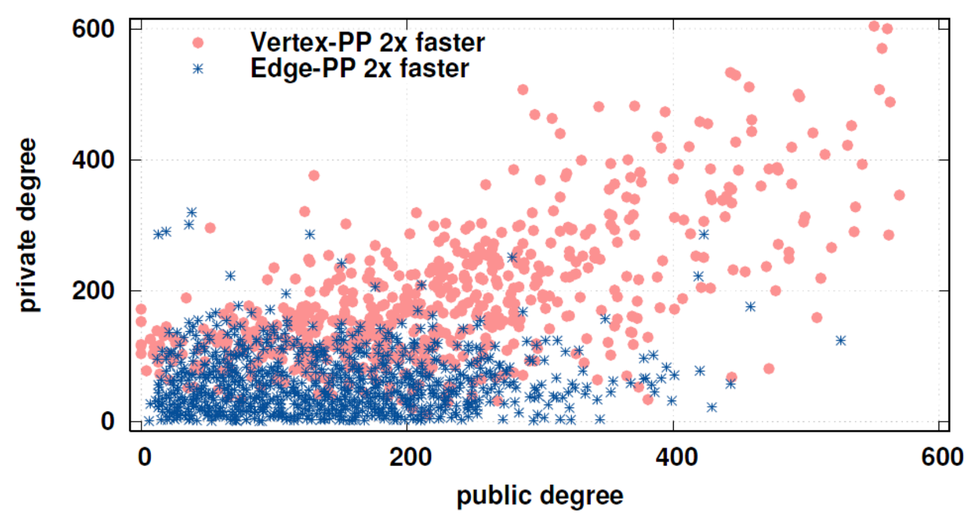
1. To design public-private graph models, and collect real-life public-private graph datasets;
2. To investigate efficient algorithms of community search and keyword search on public-private networks;
3. To develop a prototype system to demonstrate the feasibility of public-private social network analysis;

HIGHLIGHTS

Real-world Datasets Generation, Modelling, and Algorithms for Public-Private Attributed Networks

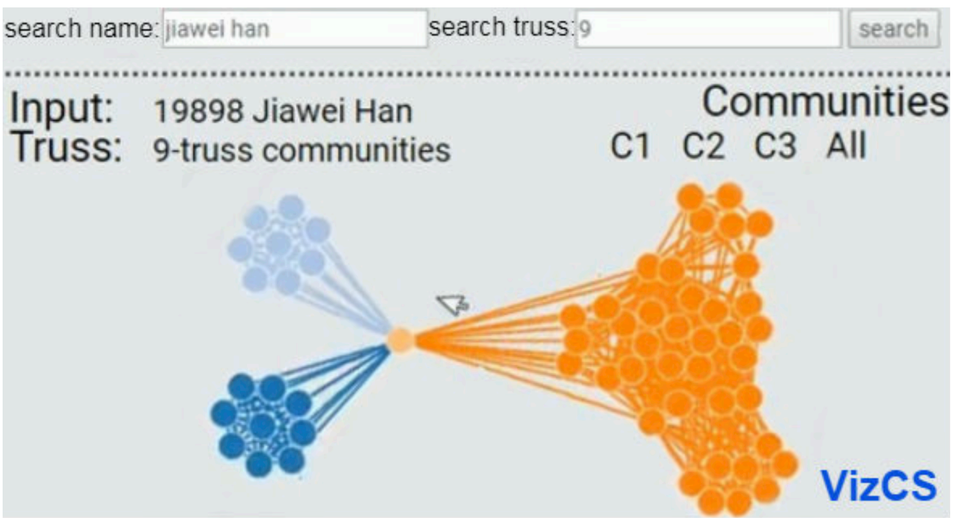
- Develop classification-based hybrid algorithms using node/edge insertions/deletions to incrementally compute k-truss in public-private graphs [1]
- Design a novel attributed public-private graph model, and generate real-life public-private network datasets with DBLP [4]

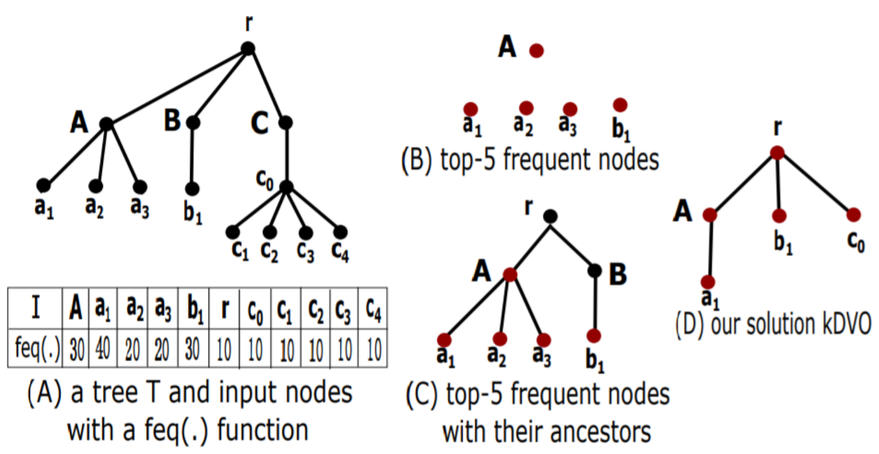




An Interactive Graph Query Processing System for Searching and Visualizing Communities

- Investigate a new problem of community search without query nodes but only using query keywords [2]
- Propose embedding based approaches [6] and generative models [7] for attributed community detection
- Develop a graph query processing system for community search [3], interactive visualization [5], and summarized view [8]





SELECTED PUBLICATIONS

1. S. Ebadian and X. Huang, “Fast Algorithm for K-Truss Discovery on Public-Private Graphs”, International Joint Conference on Artificial Intelligence, 2019 (to appear).
2. Z. Zhang, X. Huang, J. Xu, B. Choi and Z. Shang, “Keyword-Centric Community Search”, in IEEE International Conference on Data Engineering, 2019.
3. X. Huang, L. V.S. Lakshmanan and J. Xu, “Community Search in Large Graph”, Synthesis Lectures on Data Management, Morgan & Claypool Publishers, 2019 (to appear).
4. 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 Workshop on Graph Analytics, 2018.
5. Y. Jiang, X. Huang, H. Cheng and J. X. Yu, “VizCS: Online Searching and Visualizing Communities in Dynamic Graphs”, in IEEE International Conference on Data Engineering, 2018.
6. Y. Li, C. Sha, X. Huang and Y. Zhang, “Community Detection in Attributed Graphs: An Embedding Approach”, in AAAI Conference on Artificial Intelligence, 2018.
7. G. Zhang, D. Jin, J. Gao, P. Jiao, F. Fogelman-Soulié and X. Huang: “Finding Communities with Hierarchical Semantics by Distinguishing General and Specialized topics”, in International Joint Conference on Artificial Intelligence, 2018.
8. X. Huang, B. Choi, J. Xu, W. K. Cheung, Y. Zhang and J. Liu, " Ontology-based Graph Visualization for Summarized View", in ACM International Conference on Information and Knowledge Management, 2017.