Fanzhen Liu

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EDUCATION

Macquarie University, Australia   Mar. 2021 – Mar. 2024
Ph.D. in Computer Science

Macquarie University, Australia   Jan. 2019 – Dec. 2019
M.Res. in Computer Science, Grade: 93/100

Southwest University, China   Sep. 2014 – Jun. 2018
B.E. in Computer Science, GPA: 3.71/4.00

RESEARCH INTERESTS

• Graph Mining   • Graph Neural Networks   • Deep Learning   • Anomaly Detection   • Social Computing

RESEARCH PROJECT

Early Prediction in Large-scale Time-variant Information Networks   Jan. 2020 – present
Research Assistant - *advised by* <u>Dr. Jia Wu</u>, *Research Director, AI-enabled Processes Research Centre, Macquarie University*

- Project supported by the Australian Research Council (ARC)'s Discovery Early Career Research Award (DECRA, DE200100964) ($427,068)
- Working on **developing novel and efficient technologies to detect anomalies such as abnormal items, relationships, and groups in information networks**, which will help to safeguard Australian business, industry, and society from cyberfraud, online rumour-mongering, and financial loss.

Trust Evaluation and Spam Detection on Online Social Networks   Jan. 2019 – Dec. 2021
Research Assistant - *advised by* <u>Dr. Jia Wu</u>, *Research Director, AI-enabled Processes Research Centre, Macquarie University, and* <u>Dr. Surya Nepal</u>, *Senior Principal Research Scientist, & Group Leader, Distributed Systems Security, CSIRO's Data61*

- Project supported by Macquarie University Co-funding with CSIRO's Data61 ($592,000)
- Working on **the analysis of complex interactions among people on dynamic social networks**, supporting the trust evaluation of information and people available on online social networks, facing the challenges in terms of accuracy, relevancy, and consistency.

Network-Oriented Data Analysis, Mining and Optimization   Apr. 2016 – Jun. 2018
Research Assistant – *advised by* <u>Prof. Chao Gao</u>, *Northwestern Polytechnical University*

- Project supported by Fundamental Research Funds for the Central Universities (No. XDJK2016A008) (¥200,000)
- Working on **designing advanced algorithms applied to network community detection and network diffusion analysis**.

RESEARCH INTERNSHIP

Graph-based Anomaly Detection in E-commerce Scenarios   Jun. 2020 – Dec. 2020
Research Intern at Alibaba Group - advised by <u>Dr. Zhao Li</u>, *Director, Web Data Mining Lab at Alibaba-Zhejiang University Joint Institute of Frontier Technologies*

- Working on **designing an efficient anomaly detection platform to discover groups of fraudsters conduct fraud events (e.g., insurance fraud and fraudulent transactions) in e-commerce scenarios**, which will help regulators take measures for targeted control and safeguard e-commerce industry from financial loss caused by fraud.

Publications

[1] **F. Liu**, Z. L. B. W. J. Wu, J. Yang, J. Huang, Y. Zhang, W. Wang, S. Xue, S. Nepal, and Q. Z. Sheng, "eRiskCom: An e-commerce risky community detection platform", *The VLDB Journal* (**CORE[1] A***), pp. 1–17, 2022. DOI: 10.1007/s00778-021-00723-z.

[2] X. Su, S. Xue, **F. Liu**, J. Wu, J. Yang, C. Zhou, W. Hu, C. Paris, S. Nepal, D. Jin, Q. Z. Sheng, and P. S. Yu, "A comprehensive survey on community detection with deep learning", *IEEE Transactions on Neural Networks and Learning Systems* (**CORE A***), early access, 2022. DOI: 10.1109/TNNLS.2021.3137396.

[3] **F. Liu**, S. Xue, J. Wu, C. Zhou, W. Hu, C. Paris, S. Nepal, J. Yang, and P. S. Yu, "Deep learning for community detection: Progress, challenges and opportunities", in *the 29th International Joint Conference on Artificial Intelligence, (IJCAI)* (**CORE A*, 100+ Citations, Most Influential IJCAI Paper, Ranked 4th**), 2020, pp. 4981–4987. DOI: 10.24963/ijcai.2020/693.

[4] **F. Liu**, J. Wu, S. Xue, C. Zhou, J. Yang, and Q. Sheng, "Detecting the evolving community structure in dynamic social networks", *World Wide Web* (**CORE A**), vol. 23, no. 2, pp. 715–733, 2020. DOI: 10.1007/s11280-019-00710-z.

[5] S. Liu, S. Xue, **F. Liu**, J. Cheng, X. Li, C. Kong, and J. Wu, "Microcluster-based incremental ensemble learning for noisy, nonstationary data streams", *Complexity* (**Impact Factor=2.833**), vol. 2020, Art. no. 6147378, 2020. DOI: 10.1155/2020/6147378.

[6] **F. Liu**, J. Wu, C. Zhou, and J. Yang, "Evolutionary community detection in dynamic social networks", in *2019 International Joint Conference on Neural Networks (IJCNN)* (**CORE2020 A**), 2019, pp. 1–7. DOI: 10.1109/IJCNN.2019.8852006.

[7] Z. Su, **F. Liu**, C. Gao, S. Gao, and X. Li, "Inferring infection rate based on observations in complex networks", *Chaos, Solitons & Fractals* (**Impact Factor=5.944**), vol. 107, pp. 170–176, 2018. DOI: https://doi.org/10.1016/j.chaos.2017.12.029.

[8] **F. Liu**, Z. Chen, Y. Cui, C. Liu, X. Li, and C. Gao, "A hybrid evolutionary algorithm for community detection", in *the 16th International Conference on Web Intelligence (WI)*, 2017, pp. 469–475. DOI: 10.1145/3106426.3106477.

[9] **F. Liu**, J. Zhong, C. Liu, C. Gao, and X. Li, "A novel strategy of initializing the population size for ant colony optimization algorithms in tsp", in *the 13th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD)*, 2017, pp. 249–253. DOI: 10.1109/FSKD.2017.8393166.

[10] Z. Chen, **F. Liu**, C. Gao, X. Li, and Z. Zhang, "An enhanced particle swarm optimization based on Physarum model for community detection", in *the 8th International Conference on Swarm Intelligence (ICSI)*, 2017, pp. 99–108. DOI: 10.1007/978-3-319-61833-3_11.

[11] M. Liang, **F. Liu**, C. Gao, and Z. Zhang, "Robustness analysis of the complex network", in *IEEE 6th Data Driven Control and Learning Systems Conference (DDCLS)*, 2017, pp. 638–643. DOI: 10.1109/DDCLS.2017.8068147.

Popular Repository

- **Awesome-Deep-Community-Detection** (**150+** Stars & **50+** Forks)
  A collection of papers, datasets, and implementations on deep learning for community detection

Scholarships & Awards

- International Macquarie University Research Excellence Scholarship, Macquarie University — 2019–2024
- Higher Degree Research Rising Star, School of Computing, Macquarie University — May 2022
- Most Influential IJCAI Paper (*Ranked 4th* among IJCAI-2020 papers) — Feb. 2022
- Executive Dean's Commendation for Academic Excellence, Macquarie University — Apr. 2020
- Student Travel Award of IJCNN — Jul. 2019
- First Prize of Excellent Undergraduate Scholarship, Southwest University (*Top 3%*) — Dec. 2016 & Dec. 2017

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[1]The conference and journal rankings are maintained by the Computing Research and Education Association of Australasia (CORE), which assesses major conferences and journals in the computing disciplines.