

NINGYI LIAO

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EDUCATION

Nanyang Technological University

Ph.D. Candidate in Computer Science,
School of Computer Science and Engineering

Singapore

Aug. 2021 – 2025 (expected)

- Thesis Title: “Scaling up Graph Neural Networks”
- CGPA: 4.67/5

Shanghai Jiao Tong University

B.Eng. in Information Security,
School of Electronic Information and Electrical Engineering

Shanghai, China

Sept. 2017 – Jun. 2021

- Thesis: “Network Compression in Federated Machine Learning”
- CGPA: 88/100

University of California, Berkeley

Summer Session Exchange Program

Berkeley, CA, U.S.

Jul. – Aug. 2019

- CGPA: 4/4

PUBLICATION

- Zihao Yu*, Ningyi Liao*, Siqiang Luo. “GENTI: GPU-powered Walk-based Subgraph Extraction for Scalable Representation Learning on Dynamic Graphs”. *Proceedings of the VLDB Endowment* (to appear), 2024.
- Ningyi Liao, Siqiang Luo, Xiang Li, Jieming Shi. “LD²: Scalable Heterophilous Graph Neural Network with Decoupled Embedding”. *37th Conference on Neural Information Processing Systems (NeurIPS)*, 2023. [🔗](#)
- Ningyi Liao, Dingheng Mo, Siqiang Luo, Xiang Li, Pengcheng Yin. “Scalable Decoupling Graph Neural Network with Feature-Oriented Optimization”. *The VLDB Journal*, 2023. [🔗](#)
- Ningyi Liao*, Dingheng Mo*, Siqiang Luo, Xiang Li, Pengcheng Yin. “SCARA: Scalable Graph Neural Networks with Feature-Oriented Optimization”. *Proceedings of the VLDB Endowment*, Vol. 15, No. 11, pp. 3240–3248, 2022. [🔗](#)
- Kai Siong Yow, Ningyi Liao, Siqiang Luo, Reynold Cheng. “Machine Learning for Subgraph Extraction: Methods, Applications and Challenges”. *Proceedings of the VLDB Endowment Tutorial*, Vol. 16, No. 12, pp. 3864–3867, 2023. [🔗](#)
- Jun Xuan Yew, Ningyi Liao, Dingheng Mo, Siqiang Luo. “Example Searcher: A Spatial Query System via Example”. *IEEE 39th International Conference on Data Engineering (ICDE) Demo*, pp. 3635–3638, 2023. [🔗](#)
- Ningyi Liao, Shufan Wang, Liyao Xiang, Nanyang Ye, Shuo Shao, Pengzhi Chu. “Achieving Adversarial Robustness via Sparsity”. *Machine Learning*, Vol. 111, pp. 685–711, 2021. [🔗](#)

AWARD

NTU Research Scholarship

2021 – 2025

ACADEMIA SERVICES

PC Member	CIKM (Full & Short Research Paper Tracks) 2022 – 2024
External Reviewer	VLDB 2023, NeurIPS 2022 – 2023, KDD 2022 – 2023, WWW 2022 – 2024, ICDE 2022, CIKM 2021, WISE 2021
Volunteer	WWW 2024

TEACHING EXPERIENCE

Teaching Assistant	CE/CZ3002 Advanced Software Engineering NTU 2023 Spring CE/CZ4123 Big Data Management NTU 2023 Spring CE/CZ3002 Advanced Software Engineering NTU 2022 Fall CE/CZ4123 Big Data Management NTU 2022 Spring
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RESEARCH EXPERIENCE

Data Management and Analytics Lab, Nanyang Technological University

Singapore

Ph.D. Researcher. Advisor: Prof. Siqiang Luo

Aug. 2021 – Present

- Thesis Topic: **Scaling up Graph Neural Networks;**
- Conducted research integrating graph neural networks with graph management algorithms to optimize scalability;
- Studied graph neural networks and their optimization techniques with topics including normalization, efficiency-accuracy balance, parallel and distributed execution;
- Designed and developed algorithms and systems in efficiently learning graph neural networks on large-scale datasets;
- Assisted in applying for research funds; conducted literature collection, data analysis, and survey composition in related fields of graph learning;
- Mentored junior research students; assisted in lab maintenance and organization.

John Hopcroft Center for Computer Science, Shanghai Jiao Tong University

Shanghai, China

Participation in Research Program. Advisor: Prof. Liyao Xiang

Feb. 2019 – Jun. 2021

- Project Topic: **Security Issues in Artificial Intelligence and Its Optimization;**
- Designed algorithms for communication efficiency and differential privacy in federated learning by factorization;
- Designed algorithms for adversarial learning robustness by various network pruning techniques;
- Studied and implemented neural network models optimization algorithms for computer vision and neural language processing in a wide range of security-related topics including robustness, privacy, fairness, and data balance;
- Developed frameworks for neural network distributed training and architecture sparsification.

Department of Astronomy, University of California, Berkeley

Berkeley, CA, U.S.

Exchange Program. Advisor: Dr. Benjamin Horowitz

Jul. – Aug. 2019

- Project Topic: **Application of Machine Learning Approaches in Realistic Astronomical Problems;**
- Studied applying advance algorithms to the star/galaxy separation problem, built a dataset from sky survey raw data;
- Implemented multiple mainstream machine learning classification algorithms, explored and optimized parameters;
- Studied impacts of variables including magnitude variable and inference results on performance of different models.

WORKING EXPERIENCE

JD Intelligent Cities Research, JD Digits

Beijing, China

Technical Intern. Advisor: Dr. Ting Li & Prof. Junbo Zhang

Jul. – Sept. 2020

- Objective: **Spatio-temporal Neural Network Structural Optimization;**
- Implemented general network pruning APIs on various common model architectures and modules to search for optimal structure and runtime performance;
- Studied spatio-temporal model structures and data formats to specifically apply sparsification strategies, achieved effective performance improvement on realistic models in use;
- Studied pruning utility and interpretability on improving practical spatio-temporal task performance, including model size reduction, training convergence, and data generality.

TECHNICAL SKILLS

Programming	Python, C/C++, MATLAB, Java, SQL, \LaTeX
Web Development	HTML, CSS, JavaScript, Node.js, Django
ML Frameworks	PyTorch, Keras, TensorFlow

LANGUAGES

English	Professional proficiency
Chinese	Native proficiency (Mandarin, Cantonese)