NINGZHI TANG

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EDUCATION

Southern University of Science and Technology (SUSTech) Shenzhen, Guangdong, China
Department of Computer Science and Engineering Sept. 2019 - Present
Overall GPA: 3.93/4.0, *Ranking:* 1/25, *Weighted Average Score:* 94.27/100.
GPA for last 6 semesters: 3.91, 3.96, 3.91, 3.94, 3.90, 3.94.
Advisor: Dr. Yuhui Shi, IEEE Fellow.

University of Notre Dame (ND) Notre Dame, IN, USA
Exchange Student Program Aug. 2022 - Present
International Summer Undergraduate Research Experience (iSURE) Jul. 2022 - Aug. 2022
Advisor: Dr. Toby Jia-Jun Li.

National University of Singapore (NUS) Singapore
NUS School of Computing (SOC) Summer Workshop May. 2021 - Jul. 2021
Advisor: Dr. TAN Wee Kek, *Performance:* A.

SELECTED HONORS & AWARDS

The 1st Class of the Merit Student Scholarship of the University Nov. 2020, 2021, and 2022
Outstanding Student Leaders of the University Apr. 2021
The 1st Prize in Contemporary Undergraduate Mathematical Contest in Modeling, China Sept. 2021
The 1st Prize in The Chinese Mathematics Competitions, Guangdong Province Nov. 2021
Honorable Mention of Mathematical Contest in Modeling Feb. 2022

PUBLICATIONS

[1] **N. Tang***, M. Chen*, Z. Ning, A. Bansal, Y. Huang, C. McMillan, and Toby Jia-Jun Li. "An Empirical Study of Developer Behaviors for Validating and Repairing AI-Generated Code," The 13th Annual Workshop on the Intersection of HCI and PL (PLATEAU 2023). [PDF]

[2] L. Qu*, **N. Tang***, R. Zheng, Q. Nguyen, Z. Huang, Y. Shi, and H. Yin, "Semi-decentralized Federated Ego Graph Learning for Recommendation," The ACM Web Conference 2023 (WWW 2023).

[3] L. Qu, Y. Ye, **N. Tang**, L. Zhang, Y. Shi, and H. Yin, "Single-shot Embedding Dimension Search in Recommender System," The 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2022). [PDF]

RESEARCH EXPERIENCE

An Empirical Study of Developer Behaviors for Validating and Repairing AI-Generated Code
University of Notre Dame, IN, USA Jul. 2022 - Present
Accepted to PLATEAU 2023, 1st Author *programmer behavior, eye tracking, IDE tracking*

• Led an empirical study to characterize programmers' error discovery and repairing behaviors when collaborating with GitHub Copilot using eye tracking and IDE activity tracking.
• Implemented an IntelliJ IDEA plugin to collect and analyze programmer behavior data, e.g., IDE actions, keyboard typing, screen recording, file logging, and real-time gazes, from programmers in real-world coding scenarios.
• Designed experimental protocol including questionnaires, programming tasks, and semi-structured interviews protocol, and conducted a two-hour user study with nine participants.
• Implemented code independently for data cleaning, analysis, and visualization to compare the

workload, validating strategy from programmers and usability of Copilot.
• Designed and presented a poster at Lucy Family Institute Data & Society 2022 Fall Symposium.
• Finished writing a 10-page paper including a description of the study design, and qualitative and quantitative analysis findings of collected data.

Semi-decentralized Federated Ego Graph Learning for Recommendation

SUSTech, Shenzhen, China Mar. 2022 - Oct. 2022

Accepted to WWW 2023, Co-1st author *federated ego graph learning, semi-decentralized learning*

• Designed a semi-decentralized federated ego graph learning framework (SemiDFEGL) for on-device recommendations in a privacy-preserving manner, which introduced device-to-device collaborative learning to improve scalability and reduce communication costs.
• Implemented the code independently for SemiDFEGL, with techniques like self-supervised learning to improve model robustness and LDP for privacy protection.
• Evaluated the performance of SemiDFEGL for Top-*k* recommendation on three widely-used public datasets, and reproduced about 10 state-of-the-art cloud-based and federated learning based recommender models as baselines for comparison.

Single-shot Embedding Dimension Search in Recommender System

SUSTech, Shenzhen, China Sept. 2021 - Jan. 2022

Accepted by SIGIR 2022 *embedding dimension search, embedding pruning, sparse learning*

• Performed embedding dimension search in recommender systems to solve high memory usage and computation cost, as well as sub-optimal performance due to inferior dimension assignments.
• Proposed a model-agnostic single-shot embedding pruning operation called SSEDS to assign dimensions for each feature field of embeddings while maintaining the recommendation accuracy.
• Implemented the code of SSEDS independently with classical deep learning models (FM, DeepFM, Wide&Deep) for recommender systems, then conduct offline experiments on two public datasets for CTR prediction to demonstrate its performance.

SELECTED OTHER PROJECTS

Pokemon Turtle: Auto-driving and Pokemon Catching Jun. 2022

Intelligent Robots Course Project SLAM, ROS, OpenCV, TurtleBot3

• *Outcome:* Simulated a ROS system of multiple robots which could automatically get out of maze within 90 seconds, and simultaneously detect and catch Pokemon pictures on the walls precisely.
• *Evaluation:* 1st Prize (1/16) with 3000 RMB awarded by Dr. Qi Hao.

An Attention-based Convolutional Neural Network for Glaucoma Diagnosis Jan. 2022

Computer Vision Course Project Medical AI, PyTorch, Matplotlib

• *Outcome:* Designed and implemented a new attention module on ResNet-18, and evaluated its performance on ACRIMA dataset, with visualization to interpret the function of the network.
• *Evaluation:* Full score assessed by Dr. Feng Zheng.

Smart Kitchen Environment Monitoring Jul. 2021

NUS SOC Summer Workshop IoT, Micro:bit, Raspberry Pi, RESTful, MQTT

• *Outcome:* Implemented an AIoT framework using Micro:bit and Raspberry Pi to monitor the kitchen environment in real-time through sensors like DTH11, BPM280, smoke and flame sensors, and respond immediately via actuators like fans and buzzers for different comfort assessments.
• *Evaluation:* 3rd Prize awarded by Dr. Tan Wee Kek & *A* assessed by Dr. Tan Tiow Seng.

TECHNICAL SKILLS

Programming Language: Python, Java, Latex, C/C++, SQL, Matlab, R, JavaScript, Android.
Programming Skills: PyTorch, JetBrains/VSCode Plugin Development, Scikit-learn, Pandas.
English Proficiency: GRE: 320 [Verbal 150 Quantity 170 A/W 3.5].