Ta-Yang Wang

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Professional Summary

Computer Science Ph.D. specializing in the design and application of Graph Neural Networks (GNNs) with over 5 years of research and development experience. Expert in designing and implementing novel algorithms that solve complex optimization problems, translating theoretical advancements into practical, real-world applications.

Education

University of Southern California (USC) — Los Angeles, CA
Ph.D. in Computer Science — *Aug. 2019 – Present*

- Dissertation — Heterogeneous Graph Representation Learning: Algorithms and Applications
- Reviewer: WWW 2025, NeurIPS 2024, FPGA 2022 & 2023, SC 2022, CLOUD 2022, HPEC 2021, CCGrid 2021

National Taiwan University (NTU) — Taipei, Taiwan
B.S. in Mathematics | Overall GPA: 3.96/4.3 | Rank: 2nd/55 — *Sep. 2014 – June 2018*

- Honorable Mention, 9th S.-T. Yau College Student Mathematics Contest
  - Achieved finalist status (top 15) in the Applied and Computational Mathematics.
- National Taiwan University Presidential Award (Twice)
  - Awarded to students with the top 5% GPA in the department for that semester.

Experience

Data Science Lab, University of Southern California — Los Angeles, CA
Graduate Research Assistant — *Aug. 2019 – Present*

- Developed a novel bandit-sampling approach to address a key challenge in real-world graph representation learning — missing node attributes in Heterogeneous Graph Neural Networks (HGNNs).
- Accelerated large-scale HGNN training by 50% while maintaining state-of-the-art (SOTA) accuracy, publishing an adaptive sampling method with a theoretical convergence guarantee.
- Optimize resource allocation and network throughput in complex MIMO D2D wireless networks by designing and applying HGNN models to simulate 5G/IoT systems.

Medical Data Analytics Lab, National Center for Theoretical Sciences — Taipei, Taiwan
Research Assistant — *Sep. 2018 – June 2019*

- Collaborated with National Taiwan University Hospital to advance medical imaging for clinical applications.
- Designed a novel model for prostate cancer histopathology image classification using persistent homology.

Taiwan Chapter of the Society of American Baseball Research (SABR) — Taipei, Taiwan
Co-founder — *Sep. 2017 – June 2018*

- Architected an end-to-end data pipeline to ingest and analyze large-scale TrackMan datasets, delivering a novel quantitative player evaluation system for Taiwan's Professional Baseball League (CPBL).
- Developed predictive models using StatCast and PITCHf/x data to create objective, data-driven metrics for Major League Baseball (MLB) pitch quality, informing player assessment.

Skills

Programming Languages: Python, C/C++, R, Matlab, SQL
Frameworks & Libraries: PyTorch, TensorFlow, Keras, NumPy, Pandas, Matplotlib, SciPy
Developer Tools: Git, Docker, VS Code, Visual Studio, PyCharm
Teaching: Mentored 4,000+ grad/undergrad students as a Teaching Assistant for core CS/Math courses:

- **USC CSCI 570: Analysis of Algorithms** — Fall 2019 – 2022 & 2024, Spring 2020 & 2024 – 2025
- **USC CSCI 170: Discrete Methods in Computer Science** — Fall 2023
- **USC CSCI 270: Introduction to Algorithms and Theory of Computing** — Spring 2021, 2023
- **NTU MATH5425: Introduction to Cryptography** — Spring 2018

Publications

Graph Neural Networks

- **Ta-Yang Wang**, Rajgopal Kannan, and Viktor Prasanna. "Effective and Generalizable Pre-Trained Heterogeneous Graph Neural Networks with Bandit Samplers." [Under Review]
- **Ta-Yang Wang**, Rajgopal Kannan, and Viktor Prasanna. "TypeBandit: Leveraging Type-Based Bandit Sampling for Effective Attribute Completion in Heterogeneous Graph Neural Networks." *IEEE Transactions on Big Data*. [Under Review]
- **Ta-Yang Wang**, Rajgopal Kannan, and Viktor Prasanna. "Heterogeneous Graph Neural Network based on Bandit Sampling for Attribute Completion." *The 15th IEEE International Conference on Knowledge Graphs (ICKG)*, 2024.
- **Ta-Yang Wang**, Rajgopal Kannan, and Viktor Prasanna. "Training Heterogeneous Graph Neural Networks using Bandit Sampling." *The 32nd ACM International Conference on Information and Knowledge Management (CIKM)*, 2023.
- **Ta-Yang Wang**, Hongkuan Zhou, Rajgopal Kannan, Ananthram Swami, and Viktor Prasanna. "Throughput Optimization in Heterogeneous MIMO Networks: A GNN-based Approach." *The 1st Graph Neural Networking Workshop (GNNet)*, 2022.

Task Mapping

- **Ta-Yang Wang**, William Chang, Ajitesh Srivastava, Rajgopal Kannan, and Viktor Prasanna. "Monte Carlo Tree Search for Task Mapping onto Heterogeneous Platforms." *The 28th IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC)*, 2021.
- **Ta-Yang Wang**, Ajitesh Srivastava, and Viktor Prasanna. "A Framework for Task Mapping onto Heterogeneous Platforms." *IEEE High Performance Extreme Computing Conference (HPEC)*, 2020.

Tensor Decomposition

- Sasindu Wijeratne, **Ta-Yang Wang**, Rajgopal Kannan, and Viktor Prasanna. "Accelerating sparse MTTKRP for tensor decomposition on FPGA." *The 32nd ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA)*, 2023.
- Sasindu Wijeratne, **Ta-Yang Wang**, Rajgopal Kannan, and Viktor Prasanna. "Towards Programmable Memory Controller for Tensor Decomposition." *The 11th International Conference on Data Science, Technology and Applications (DATA)*, 2022.

Memory Access Prediction

- Pengmiao Zhang, Ajitesh Srivastava, **Ta-Yang Wang**, Cesar AF De Rose, Rajgopal Kannan, and Viktor Prasanna. "C-MemMAP: Clustering-driven Compact, Adaptable, and Generalizable Meta-LSTM Models for Memory Access Prediction." *International Journal of Data Science and Analytics (JDSA)*, 2021.
- Ajitesh Srivastava, **Ta-Yang Wang**, Pengmiao Zhang, Cesar Augusto F De Rose, Rajgopal Kannan, and Viktor Prasanna. "MemMAP: Compact and Generalizable Meta-LSTM Models for Memory Access Prediction." *The 24th Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*, 2020.