Yang, Chien-Yi

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Research Interests

My research interest lies in system optimization, machine learning (ML), electronic design automation (EDA), and quantum computing. I am currently working on system optimization.

Education

University of California San Diego **September 2022 – present**
Ph.D. in Computer Science and Engineering

National Taiwan University **September 2017 – June 2021**
Bachelor of Electrical Engineering

Experience

IEEE Computer Architecture Letter **September 2023 – present**
reviewer

University of California San Diego **September 2022 – present**
PhD student

- Developed an algorithmic-neural network mixed framework for the Rectilinear Steiner Minimum Tree Problem (RSMT) to increase the scalability from 1k points of prior works to 10k points.
- Software-Hardware Co-Optimization for processing in-memory.

MediaTek **December 2021 – June 2022**
R&D Engineer

- Designed and implemented a reinforcement learning method that speeds up floorplanning by more than 3 times.
- Deployed a distributed training system of an LLM on a cluster of $>$ 100 GPUs and sped up the system by 30x by careful profiling and reducing the critical path.
- Designed an information retrieval system by augmenting transformers to reduce the error rate by 40%.

Maxeda Technology **September 2021 – December 2021**
R&D Engineer

- Designed experiments to verify a reinforcement learning-based chip design model to justify solution quality.

National Taiwan University **September 2017 – June 2021**
Research Assistant

- Designed and developed a novel qubit mapping framework and algorithm that scales up to 20,000 qubits (only 127 in prior works).

Publications

- Andrew B. Kahng, Robert Nerem, Yusu Wang, **Chien-Yi Yang**. 2024. NN-Steiner: A Mixed Neural-algorithmic Approach for the Rectilinear Steiner Minimum Tree Problem. AAAI'24.
- Cheng, **C., Yang**, C., Wang, R., Kuo, Y., & Cheng, H. (2022). Robust Qubit Mapping Algorithm via Double-Source Optimal Routing on Large Quantum Circuits ArXiv. /abs/2210.01306
- Philipp Ennen, Federica Freddi, Chyi-Jiunn Lin, Po-Nien Kung, RenChu Wang, **Chien-Yi Yang**, Da-shan Shiu, and Alberto Bernacchia. FEVER'23
- Fu-Chieh Chang, Yu-Wei Tseng, Ya-Wen Yu, Ssu-Rui Lee, Alexandru Cioba, I-Lun Tseng, Da-shan Shiu, Jhih-Wei Hsu, Cheng-Yuan Wang, **Chien-Yi Yang**, Ren-Chu Wang, Yao-Wen Chang, Tai-Chen Chen, and Tung-Chieh Chen. 2022. Flexible chip placement via reinforcement learning: late breaking results. DAC'22.

Projects

Qsyn
An open-sourced quantum circuit compilation framework ***100+ stars***

- A qubit mapping framework that scales up to 20,000 qubits.

Skills

Programming Languages: C++, Python, Rust, Tcl, JavaScript, Java, Matlab
Technologies: Git, Shell Script, Docker
Natural Languages: Chinese, English, Japanese, Spanish