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

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.
- Optimizing system configuration on a noisy HDnn-RRAM hardware and its corresponding software.

MediaTek   **December 2021 – June 2022**
R&D Engineer
- Designed and implemented a reinforcement learning method that speeds up floorplanning by more than 3 times.
- Designed an information retrieval system by augmenting transformers to reduce the error rate by 40%.
- Sped up the existing distributed training system by 30x by careful profiling and reducing the critical path.

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

- **Chien-Yi Yang**, Jiantao Liu, Minxuan Zhou, Tajana Rosing. 2024. OpenPIM: Accurate and Fast Modeling of Logic in Memory. Submitted to DAC'24.

- 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. Submitted to AAAI'24.

- Cheng, **C., Yang**, C., Wang, R., Kuo, Y., & Cheng, H. (2022). Qubit Mapping Toward Quantum Advantage. 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. 2023. Hierarchical Representations in Dense Passage Retrieval for Question-Answering. In Proceedings of the Sixth Fact Extraction and VERification Workshop (FEVER), pages 17–28, Dubrovnik, Croatia. Association for Computational Linguistics.

- 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. In Proceedings of the 59th ACM/IEEE Design Automation Conference (DAC '22). Association for Computing Machinery, New York, NY, USA, 1392–1393. https://doi.org/10.1145/3489517.3530617

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