Yi-Hua Chung

yihua.chung@wisc.edu Yi-Huaaa +1 (608)-692-3491 YHC's blog Yi-Hua Chung Google Scholar

EDUCATION

Ph.D. Engineering in Electrical and Computer Engineering 09/2023 – Present
University of Wisconsin-Madison
GPA: 4.00/4.00 (Fall 23 - Present)
Courses: High Performance Computing; Computer-Aided Design for VLSI; Design Automation of Digital Systems

Master of Science in Computer Science 02/2021 – 08/2022
Graduate Institute of Networking and Multimedia, National Taiwan University
GPA: 4.25/4.30, Rank: 1/47

Bachelor of Science in Engineering 09/2016 – 01/2021
Biomechatronics Engineering, National Taiwan University

PUBLICATIONS

Conference, Journal, and Thesis

- Boyang Zhang, Che Chang, Cheng-Hsiang Chiu, Dian-Lun Lin, Yang Sui, Chih-Chun Chang, **Yi-Hua Chung**, Wan-Luan Lee, Zizheng Guo, Yibo Lin, and Tsung-Wei Huang, "iTAP: An Incremental Task Graph Partitioner for Task-parallel Static Timing Analysis," *IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC)*, Tokyo, Japan, 2025
- Che Chang, Boyang Zhang, Cheng-Hsiang Chiu, Dian-Lun Lin, **Yi-Hua Chung**, Wan-Luan Lee, Zizheng Guo, Yibo Lin, and Tsung-Wei Huang, "PathGen: An Efficient Parallel Critical Path Generation Algorithm," *IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC)*, Tokyo, Japan, 2025
- Chen, Han-Ting, **Yi-Hua Chung**, Vincent Hwang, and Bo-Yin Yang. "Algorithmic Views of Vectorized Polynomial Multipliers–NTRU." In *International Conference on Cryptology in India*, pp. 177-196. Cham: Springer Nature Switzerland, 2023.
- Chen, Han-Ting, **Yi-Hua Chung**, Vincent Hwang, Chi-Ting Liu, and Bo-Yin Yang. "Algorithmic Views of Vectorized Polynomial Multipliers for NTRU and NTRU Prime (Long Paper)." *Cryptology ePrint Archive*, Report 2023/541, 2023. https://eprint.iacr.org/2023/541.
- **Chung, Yi-Hua**. "Enlarging Quantum Circuit Simulation and Analysis with Non-Volatile Memories." Master's thesis, National Taiwan University, 2022.
  - **Received the 2022 Future Tech Awards,** Ministry of Science and Technology (MOST) of Taiwan.
- **Chung, Yi-Hua**, Cheng-Jhih Shih, and Shih-Hao Hung. "Accelerating simulated quantum annealing with gpu and tensor cores." In *International Conference on High Performance Computing*, pp. 174-191. Cham: Springer International Publishing, 2022.
  - **2022 NTUEE-1975 Innovation and Entrepreneurship Award.**
- **Yi-Hua, Chung**, Huang Jun-Fu, Hu Yuan-Chen, and Huang Chen-Kang. "Development of a Small Intelligent Weather Station for Agricultural Applications." *Advances in Technology Innovation* 6, no. 2 (2021): 74.
  - **Best Paper Award** in the 9th international multi-conference on Engineering and Technology Innovation, 2020.

PROFESSIONAL EXPERIENCE

Technical Intern; R&D Team, EDA Group 06/2024 – 12/2024
Synopsys Inc; CA

- Leveraging hybrid-computing of CPU-GPU co-processing into the Fusion Compiler tool.
- Accelerating Gate-sizing problem by adopting GPUs in Fusion Compiler tool with 4x-8x compared with 64 cores CPU version.

Graduate Research Assistant, supervised by Prof. Tsung-Wei Huang 08/2023 – present
University of Wisconsin-Madison

- Researched GPU-accelerated testing and verification algorithms, especially on fault simulation.
- Researched parallel and heterogeneous gate-sizing algorithms in timing-driven optimization.

Full-time Research Assistant, supervised by Prof. Bo-Yin Yang 08/2022 – 03/2023
Institute of Information Science, Academia Sinica

- Accelerated big-integer multiplication by adopting the Fast NTT algorithm with warp primitive and inline PTX on GPU.
- Implemented lattice-based cryptosystems, including NTRU and NTRU Prime, on Cortex-A72 and accelerated the program by adopting fast NTT, Toom-Cook algorithm, and Schönhage-Strassen algorithm under the ARMv8-A architecture.

Research Assistant, supervised by Prof. Shih-Hao Hung 07/2021 – 08/2022
Performance, Applications, and Security Lab, National Taiwan University

- Researched quantum-related topics, including quantum annealing, quantum simulation, and quantum machine learning.
- Led a study group and assisted labmates on large-scale simulated quantum annealing (SQA) on multi-GPU.

Teaching Assistant, Computer Architecture
National Taiwan University

- Designed laboratories for students to implement simple ALU, FPU, CPU (Verilog), and pipelined CPU (RISC-V).

PROJECTS AND AWARDS

Variational Neural Annealing - Recurrent Neural Network Wave Functions

- Reproduced works from Waterloo University on solving 1D and 2D Ising problems with 1D and 2D RNN models and
- Compared performance and solution quality between variational neural annealing with classical SQA (Repo, Report).

2022 Quantum Computing Mentorship Program (QOSF) Cohort-5

- Designed and constructed oracle and diffuse functions of Grover's algorithm for solving quantum tic-tac-toe problems (Repo).

2D Pattern Matching for DNA sequences

NTU-IBM Q System Q-Camp, 2020.

- Received **Outstanding Performance Award** in a hackathon organized by IBM and National Taiwan University (Repo1, 2).

SKILLS

C/C++, CUDA C/C++, OpenMP, ARM Intrinsic, ARM Assembly, Linux, Shell — *Expert*

Python, C#, Qiskit, JavaScript, WebGL — *Experienced*