Chung-En Ho

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Education

National Taiwan University
Taipei, Taiwan

B.S. Major Electrical Engineering, Minor Computer Science *Aug., 2020 - Jun. 2024*

- Overall GPA: **4.20/4.30**.
- Honors: Received 2 Dean's List Award (given to top 5% students in class)
- Highlighted Courses: Data Structure and Algorithm, Probability and Statistics, System Programming, Computer Architecture, Operating Systems, Introduction to Artificial Intelligence, Introduction to Generative AI, Computer-aided VLSI Design

Research Experiences

Cyber-Physical Systems Lab
Taipei, Taiwan

Undergraduate Researcher, Advised by Prof. Chung-Wei Lin *Oct., 2023 - Present*

- Proposed a quantization strategy for communicate-efficient Deep Neural Network inference in vehicular edge computing to enhance the inference performance. [1]
- Implemented reinforcement-learning-based methods as the quantization decision process. Reduced inference latency and communication time by 21% and 31% while complying accuracy constraints.

Analog AI team, IBM Research Almaden Lab
San Jose, CA, USA

Research Intern, Advised by Dr. Geoffrey Burr and Dr. Hsinyu Tsai *Jun., 2023 - Sept., 2023*

- Researched compute-in-memory (CIM) architecture to enable high-throughput deep neural network inference. Analyzed design trade-off between volatile-memory and non-volatile memory based system on a data-transfer scale. [2]
- Implemented a highly pipelined architecture for Transformer encoder-based LLM inference. Achieved >2x area efficiency on volatile-memory based CIM systems than the previous published work.
- Contributed to a C++-based simulator to evaluate CIM systems performance, improving its ability to analyze CIM system architectures under different settings.

Access IC Lab
Taipei, Taiwan

Undergraduate Researcher, Advised by Prof. An-Yeu Wu *Aug., 2022 - Jul., 2023*

- Researched in CIM-aware energy-efficient post-training quantization methods for Vision Transformer.
- Developed energy-efficient weight-mapping solutions in mix ADC precision CIM systems. Reduced inference energy by 15% with the proposed method.

Writing and Publications

[1] **Chung-En Ho**, Chung-Ting Tsai, I-Ching Tseng, Chung-Wei Lin. A Quantization Strategy for Communication-Efficient DNN Inference in Vehicular Edge Computing. *Under Review*.

[2] G. W. Burr, H. Tsai, W. Simon, I. Boybat, S. Ambrogio, **C.-E. Ho**, Z.-W. Liou, M. Rasch, J. Büchel, P. Narayanan, T. Gordon, S. Jain, T. M. Levin, K. Hosokawa, M. Le Gallo, H. Smith, M. Ishii, Y. Kohda, A. Chen, C. Mackin, A. Fasoli, K. El Maghraoui, R. Muralidhar, A. Okazaki, C.-T. Chen, M. M. Frank, C. Lammie, A. Vasilopoulos, A. M. Friz, J. Luquin, S. Teehan, I. Ahsan, A. Sebastian, and V. Narayanan. Design of Analog-AI Hardware Accelerators for Transformer-based Language Models. *International Electron Devices Meeting (IEDM)*, 2023.

Working Experiences

Skymizer Inc.
Taipei, Taiwan

Software Engineer Intern *Oct. 2024 - Present*

- Implementing multimodal language model LLaVA in C for circuit high-level synthesis.

Department of Electrical Engineering, NTU
Taipei, Taiwan

Teaching Assistant, EE2011 Signal and Systems *Feb., 2023 - Jun., 2023*

- Hosted TA hours weekly for 100+ students.

Amazon Ring Inc.
Taipei, Taiwan

Software Development Engineer Intern *Jul., 2022 - Aug., 2022*

- Worked on Amazon Ring's doorbell device audio test automation projects. Co-worked with hardware teams, identified acoustic tools to utilize and proposed pipeline for the test automation process in the embedded system.
- Incorporated the proposed testing pipeline into the continuous deployment process of the product, automating two acoustic testing items.

Project Experiences

5G MIMO demodulator
Taipei, Taiwan

Final Project in Computer-Aided VLSI Design Course. *Jun., 2023*

- Designed an MIMO 4-QAM symbol demodulator using fixed complexity sphere decoder algorithm with Verilog. Designed and verified functionality through VLSI design flow.
- Achieved 0.57mW power and 48k μm^2 die area with 50MHz clock frequency using TSMC 130nm technology. Ranked top 5 performance in the class.
- Invited to present the algorithm, design performance and implementation to the class and MediaTek engineers.

Honors

2023	**Second Prize and Global Nominee**, NASA Space Apps Challenge	*Taipei, Taiwan*
2023	**Second Prize**, IC contest, Undergraduate Cell-based Digital Circuit Design	*Hsinchu, Taiwan*
2022	**Best Presentation Award**, Amazon Ring Internship Innovation Challenge	*Taipei, Taiwan*
2021	**PixArt Inc. Prize & Grand Award**, Meichu Hackathon	*Hsinchu, Taiwan*
2021	**Award winner**, Hui-Rong Foundation Scholarship	*Taipei, Taiwan*
2020	**Award winner**, Fu-Bell scholarship	*Taipei, Taiwan*

Extracurricular, Volunteer & Leadership

EE+ - NTUEE Student Association
Taipei, Taiwan

Member and Director *Oct., 2020 - Aug., 2023*

- Hosted overseas alumni connection services with undergraduate students.
- Facilitated 40+ pairing of overseas alumni and students who planned to attend graduate schools abroad.
- Developed a web page and hosted a group to serve 1400+ alumni and 800 students.

Epoch Foundation
Taipei, Taiwan

MIT-Taiwan Industrial Cooperation Research Intern *Feb., 2023 - Feb., 2024*

- Collected recent news of MIT CSAIL and information from MIT-ILP and served the information to 30+ Taiwan companies in alliance with MIT.
- Explored cooperation opportunities between MIT and Taiwan companies in alliance by surveying project news on MIT News and make recommendations to the companies monthly.

Teaching Group, NTUEE Camp
Taipei, Taiwan

Software Group Co-Leader *Jul., 2022*

- Gave 140 senior-high-school students an introduction to Python, machine learning, and its application in speech recognition.
- Led 10 freshman students to design the course and the labs. Completed a project using CNN for spectrum classification in speech recognition, tailored for teaching purposes during the camp.

Skills

Natural Languages	Chinese (Native), English (Fluent), German (Basic)
Programming Languages	Python, C/C++, JavaScript
Software	Shell scripting, UNIX systems, Git, Conda
Libraries	PyTorch, React, Flask, GraphQL