Yung-Chin (Jim) Chen

yc9182@princeton.edu | LinkedIn | Homepage | Google Scholar

Research Interests

VLSI Designs, Computer Architecture, Computing-In-memory Processor, NN Accelerator

Education

Princeton University — Princeton, NJ, USA
Ph.D. student in Electrical and Computer Engineering (ECE) — *Sep 2024 - Present*

National Taiwan University — Taipei, Taiwan
Bachelor of Science in Electrical Engineering (EE) — *Sep 2019 – Jan 2024*

- Phi Tau Phi Honorary Member (for top 1% of college graduates), Major GPA: 4.28 / 4.30

Keio University — Tokyo, Japan
Exchange Student with Full Scholarship — *Oct 2022 – Jul 2023*

Research Experience

Research Assistant at Computing and Sensing Group — Sep 2022 – Feb 2024
Keio University (Advisor: Prof. Kentaro Yoshioka) — *Kanagawa, Japan*

- Researched on saliency-aware Computing-In-Memory (CIM) macro for Neural Network (NN).
- Researched on memory-centric algorithm-architecture co-design for novel NN framework.

Research Assistant at Energy-Efficient Circuits and Systems Lab — Sep 2021 – Feb 2024
National Taiwan University (Advisor: Prof. Tsung-Te Liu) — *Taipei, Taiwan*

- Taped out a 28nm SRAM CIM-based accelerator for end-to-end NN inference.

Publications

[1] **Yung-Chin Chen**, S. Ando, D. Fujiki, S. Takamaeda-Yamazaki, K. Yoshioka, "OSA-HCIM: On-The-Fly Saliency-Aware Hybrid SRAM CIM with Dynamic Precision Configuration", *in Asia and South Pacific Design Automation Conference (ASP-DAC), 2024*

[2] W. Zhang, S. Ando, **Yung-Chin Chen**, S. Miyagi, S. Takamaeda-Yamazaki, K. Yoshioka, "PaCiM: A Sparsity-Centric Hybrid Compute-in-Memory Architecture via Probabilistic Approximation", *in International Conference on Computer-Aided Design (ICCAD), 2024*

[3] **Yung-Chin Chen**, S. Ando, D. Fujiki, S. Takamaeda-Yamazaki, K. Yoshioka, "HALO-CAT: A Hidden Network Processor with Activation-Localized CIM Architecture and Layer-Penetrative Tiling", *in arXiv*

[4] S. Ando, **Yung-Chin Chen**, S. Miyagi, W. Zhang, K. Yoshioka, "A Saliency-Aware Analog Computing-In-Memory Macro with SAR-Embedded Saliency Detection Technique", *In International Conference on Solid State Devices and Materials (SSDM), 2024*

[5] K. Yoshioka, S. Ando, S. Miyagi, **Yung-Chin Chen**, W. Zhang, "Towards Efficient and Precise Analog Compute-in-Memory Circuits", *In International Conference on Solid State Devices and Materials (SSDM), 2024 (Invited)*

[6] K. Yoshioka, S. Ando, S. Miyagi, **Yung-Chin Chen**, W. Zhang, "A Review of SRAM-based Compute-in-Memory Circuits", *in Japanese Journal of Applied Physics (JJAP), 2024*

[7] W. Zhang, S. Ando, **Yung-Chin Chen**, K. Yoshioka, "ASiM: Improving Transparency of SRAM-based Analog Compute-in-Memory Research with an Open-Source Simulation Framework", *Under Review*

[8] S. Ando, **Yung-Chin Chen**, S. Miyagi, W. Zhang, K. Yoshioka, "A Saliency-Aware Analog Computing In-Memory with SAR-Embedded Detection Achieving 18.5% Power Reduction", *in Japanese Journal of Applied Physics (JJAP), 2024*

Honors and Awards

Irving T. Ho Memorial Scholarship - EE dept. at NTU — Dec 2022

The Memorial Scholarship Foundation to Lin Hsiung Chen (acc. rate: 2%) — Nov 2022

Research Grant - National Science and Technology Council (NSTC), Taiwan — Jul 2022 – Jan 2023

Research Grant - Taiwan Semiconductor Manufacturing Co., Ltd (TSMC) — Feb 2022 – Jun 2022

1st Place (Best Solver Award) - MakeNTU - largest student maker hackathon in Taiwan — Mar 2022

Teaching Experience

TA in Computer Architectures, lectured by Prof. Tsung-Te Liu — Sep 2023 – Jan 2024

- Designed Verilog assignments including ALU, CPU, and Cache and delivered programming tutorials

TA in EECS Lab Undergraduate Research, supervised by Prof. Tsung-Te Liu — Sep 2023 – Jan 2024

- Guided lab members through CIM paper survey and circuit simulation
- Established training courses for circuit design tools, encompassing HSPICE, Verilog, and Virtuoso

TA in Signal and Systems, lectured by Prof. Lin-Shan Lee — Feb 2022 – Jun 2022

- Delivered MATLAB lectures, held weekly problem-solving seminars, and graded homework and exams

Technical Skills

Programming: Verilog, System Verilog, Python, C++, MATLAB
IC Design Tools: NC-Verilog, Design Compiler, Innovus, Virtuoso, HSPICE, FPGA
Toolbox: PyTorch, NumPy, LaTeX
Languages: Chinese (Native), English (TOEFL: 110, GRE: 333), Japanese (JLPT N1)

Teaching Experience

Compulsory Military Service in Taiwan — Mar 2024 – Jun 2024

Student Ambassador of National Taiwan University — Oct 2021 – Sep 2022

- Introduced Taiwan to foreign visitors, orchestrated international events, and guided campus tours
- Provided support for international scholars to facilitate their integration into the life in Taiwan

Vice Captain of NTUEE Baseball Team — Sep 2021 – Aug 2022

- Led and coached a team of 20+ players; provided personalized instructions and training menus

Vice President of NTU Escape Room and Puzzle Solving Club — Aug 2020 – Jul 2021

- Led a club of 30+ members to design engaging puzzles and develop reality games
- Held 3 school-wide real escape games, attracting over 200 participants