

Yung-Chin (Jim) Chen

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RESEARCH INTERESTS

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

EDUCATION

Princeton University

Ph.D. student in Electrical and Computer Engineering (ECE)

- GPA to date: 4.0 / 4.0

Princeton, NJ, USA

Sep 2024 - Present

National Taiwan University (NTU)

Bachelor of Science in Electrical Engineering (EE)

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

Taipei, Taiwan

Sep 2019 - Jan 2024

Keio University

Exchange Student with Full Scholarship

Tokyo, Japan

Oct 2022 - Jul 2023

RESEARCH EXPERIENCE

PhD Student at Verma Lab

Princeton University (Advisor: Prof. Naveen Verma)

- Researching on In-memory Computing (IMC) systems and architectures

Jan 2025 – Now

Princeton, NJ, USA

Visiting RA at Computing and Sensing Group

Keio University (Advisor: Prof. Kentaro Yoshioka)

- Researched on saliency-aware IMC macro for Neural Network (NN)
- Researched on memory-centric algorithm-architecture co-design for novel NN framework

Sep 2022 – Feb 2024

Kanagawa, Japan

Undergrad RA at Energy-Efficient Circuits and Systems Lab

National Taiwan University (Advisor: Prof. Tsung-Te Liu)

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

Sep 2021 – Feb 2024

Taipei, Taiwan

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
Principal Award - Awarded to top 2% NTUEE students for their academic excellences	Dec 2022

TEACHING EXPERIENCE

TA in Computer Architectures , lectured by Prof. Tsung-Te Liu	Sep 2023 – Jan 2024
<ul style="list-style-type: none">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
<ul style="list-style-type: none">Guided lab members through CIM paper survey and circuit simulationEstablished 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
<ul style="list-style-type: none">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, TensorFlow, NumPy, L^AT_EX
Languages: Chinese (Native), English (TOEFL: 110, GRE: 333), Japanese (JLPT N1)

ACTIVITIES

Compulsory Military Service in Taiwan	Mar 2024 – Jun 2024
Student Ambassador of National Taiwan University	Oct 2021 – Sep 2022
<ul style="list-style-type: none">Introduced Taiwan to foreign visitors, orchestrated international events, and guided campus toursProvided support for international scholars to facilitate their integration into the life in Taiwan	
Vice Captain of NTUEE Baseball Team	Sep 2021 – Aug 2022
<ul style="list-style-type: none">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
<ul style="list-style-type: none">Led a club of 30+ members to design engaging puzzles and develop reality gamesHeld 3 school-wide real escape games, attracting over 200 participants	