

Yuzong Chen

Mobile: +1 (607) 262-1616, **Email:** yc2367@cornell.edu, **Website:** <https://yc2367.github.io>

EDUCATION

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| • Cornell University
Ph.D. in Electrical and Computer Engineering
<i>Advisor: Prof. Mohamed S. Abdelfattah</i> | Aug. 2022 – Aug. 2026 (Expected) |
| • Nanyang Technological University, Singapore
B.Eng. in Electrical & Electronic Engineering
GPA: 4.74 / 5.00, Honours (Highest Distinction) | Aug. 2015 – Jun. 2019 |

RESEARCH INTERESTS

Efficient Hardware for Deep Learning: I am interested in developing novel hardware architectures for accelerating deep learning applications. This includes efficient inference algorithms and accelerator co-design.

RESEARCH EXPERIENCE

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| • Stanford University
<i>Incoming Visiting Scholar</i>
Work on large language model acceleration via compute-optimal test-time scaling. | Jan. 2026 – Apr. 2026
<i>Advisor: Prof. Thierry Tambe</i> |
| • Cornell University
<i>Graduate Research Assistant</i>
Work on algorithm-hardware co-design for machine learning acceleration. | Aug. 2022 – Present
<i>Advisor: Prof. Mohamed S. Abdelfattah</i> |
| • National University of Singapore
<i>Research Engineer</i>
Work on a joint project with NXP Semiconductors to design an RF switched-capacitor power amplifier for high-speed communication. Help tape-out the chip in 22nm FDSOI technology. | Sept. 2021 – Jul. 2022
<i>Advisor: Prof. Heng Chun-Huat</i> |
| • Nanyang Technological University, Singapore
<i>Project Officer</i>
Conduct and lead projects about computing in-memory circuit design based on static random access memory (SRAM) and resistive random access memory (ReRAM). Tape-out several chips in 65nm technology. | Feb. 2020 – Aug. 2021
<i>Advisor: Prof. Tony Tae-Hyoung Kim</i> |

INDUSTRY EXPERIENCE

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| • Samsung Semiconductor , San Jose, CA
<i>Architecture Research Intern</i>
Propose novel LLM quantization algorithms by jointly considering all matrix multiplication modules. | Jun. 2025 – Aug. 2025 |
| • Qualcomm AI Research , San Diego, CA
<i>Research Intern</i>
Implement performance modelling framework for deep learning on heterogeneous hardware platforms. | Sept. 2024 – Dec. 2024 |

PUBLICATIONS

• Conference Proceedings

- [1] **Yuzong Chen**, Chao Fang, Xilai Dai, Yuheng Wu, Thierry Tambe, Marian Verhelst, and Mohamed S. Abdelfattah, “Unlocking Efficient Processing-In-Memory for Edge LLM Inference with Hybrid Numerical Formats”, submitted to *ACM/IEEE International Symposium on Computer Architecture (ISCA)*, 2026. **[Under Review]**
- [2] **Yuzong Chen**, Ahmed AbouElhamayed, Xilai Dai, Yang Wang, Marta Andronic, George A. Constantinides, and Mohamed S. Abdelfattah, “BitMoD: Bit-serial Mixture-of-Datatype LLM Acceleration”, *IEEE International Symposium on High-Performance Computer Architecture (HPCA)*, 2025.
- [3] **Yuzong Chen**, Jian Meng, Jae-sun Seo, and Mohamed S. Abdelfattah, “BBS: Bi-directional Bit-level Sparsity for Deep Learning Acceleration,” *IEEE/ACM International Symposium on Microarchitecture (MICRO)*, 2024.
- [4] Xilai Dai, **Yuzong Chen**, and Mohamed S. Abdelfattah, “Kratos: An FPGA Benchmark for Unrolled Deep Neural Networks with Fine-Grained Sparsity and Mixed Precision”, *IEEE International Conference on Field-Programmable Logic and*

Applications (FPL), 2024.

- [5] Jordan Dotzel, **Yuzong Chen**, Bahaa Kotb, Sushma Prasad, Gang Wu, Sheng Li, Mohamed S. Abdelfattah, and Zhiru Zhang, "Learning from Students: Applying t-Distributions to Explore Accurate and Efficient Formats for LLMs", *International Conference on Machine Learning (ICML)*, 2024.
- [6] **Yuzong Chen**, Jordan Dotzel, and Mohamed S. Abdelfattah, "M4BRAM: Mixed-Precision Matrix-Matrix Multiplication in FPGA Block RAMs", *IEEE International Conference on Field Programmable Technology (FPT)*, 2023.
- [7] **Yuzong Chen**, and Mohamed S. Abdelfattah, "BRAMAC: Compute-in-BRAM Architectures for Multiply-Accumulate on FPGAs", *IEEE International Symposium on Field-Programmable Custom Computing Machines (FCCM)*, 2023.
- [8] **Yuzong Chen**, Junjie Mu, Hyunjoon Kim, Lu Lu, and Tony Tae-Hyoung Kim, "A Reconfigurable 8T SRAM Macro for Bit-Parallel Searching and Computing In-Memory", *IEEE International Symposium on Circuits and Systems (ISCAS)*, 2022.
- [9] Yuncheng Lu, Zehao Li, **Yuzong Chen**, and Tony Tae-Hyoung Kim, "A 181 μ W Real-Time 3-D Hand Gesture Recognition System based on Bi-directional Convolution and Memoryless Clustering", *IEEE Custom Integrated Circuits Conference (CICC)*, 2022.
- [10] **Yuzong Chen**, Lu Lu, Yuncheng Lu, and Tony Tae-Hyoung Kim, "A Multi-Functional 4T2R ReRAM Macro Enabling 2-Dimensional Access and Computing In-Memory", *IEEE International Symposium on Circuits and Systems (ISCAS)*, 2021.
- [11] Lu Lu, **Yuzong Chen**, and Tony Tae-Hyoung Kim, "A Configurable Randomness Enhanced RRAM PUF with Biased Current Sensing Scheme", *IEEE International Symposium on Circuits and Systems (ISCAS)*, 2021.
- [12] Vishal Sharma, Ju Eon Kim, Yong-Jun Jo, **Yuzong Chen**, and Tony Tae-Hyoung Kim, "AND8T SRAM Macro with Improved Linearity for Multi-bit In-Memory Computing", *IEEE International Symposium on Circuits and Systems (ISCAS)*, 2021.
- [13] **Yuzong Chen**, Lu Lu, Bongjin Kim, and Tony Tae-Hyoung Kim, "Reconfigurable 2T2R ReRAM with Split Word-lines for TCAM Operation and In-Memory Computing", *IEEE International Symposium on Circuits and Systems (ISCAS)*, 2020.

• Journal Articles

- [1] **Yuzong Chen**, Chi-Chih Chang, Xilai Dai, Ahmed AbouElhamayed, Marta Andronic, George A. Constantinides, and Mohamed S. Abdelfattah "Bit-serial Acceleration of LLM Inference with Mixture-of-Datatype Quantization", *IEEE Transactions on Computers (TC)*, 2025.
- [2] **Yuzong Chen**, Junjie Mu, Hyunjoon Kim, Lu Lu, and Tony Tae-Hyoung Kim, "BP-SCIM: A Reconfigurable 8T SRAM Macro for Bit-Parallel Searching and Computing In-Memory", *IEEE Transactions on Circuits and Systems I: Regular Papers (TCAS-I)*, 2023.
- [3] Donghyuk Kim, Chengshuo Yu, Shanshan Xie, **Yuzong Chen**, Joo-Young Kim, Bongjin Kim, Jaydeep Kulkarni, and Tony Tae-Hyoung Kim, "An Overview of Processing-in-Memory Circuits for Artificial Intelligence and Machine Learning", *IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS)*, 2022. **[Featured as one of the most popular papers in IEEE JETCAS]**
- [4] **Yuzong Chen**, Lu Lu, Bongjin Kim, and Tony Tae-Hyoung Kim, "A Reconfigurable 4T2R ReRAM Computing In-Memory Macro for Efficient Edge Applications", *IEEE Open Journal of Circuits and Systems (OJCAS)*, 2021.
- [5] **Yuzong Chen**, Lu Lu, Bongjin Kim, and Tony Tae-Hyoung Kim, "Reconfigurable 2T2R ReRAM Architecture for Versatile Data Storage and Computing In-Memory", *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, 2020.

• Book Chapters

- [1] Tony Tae-Hyoung Kim, **Yuzong Chen**, and Lu Lu, "ReRAM-based Processing-in-Memory (PIM)", in *Processing-in-Memory for AI from Circuits to Systems*, Springer, 2022, pp. 93-120.

TEACHING EXPERIENCE

- Modern Computer Systems and Architecture (ECE5755 / CS5754, Cornell Tech) Fall 2025
Head Teaching Assistant *Instructor: Prof. Udit Gupta*
- Applied Machine Learning (CS5785, Cornell Tech) Fall 2023
Teaching Assistant *Instructor: Prof. Kyra Gan*

HONOURS AND AWARDS

- Student Travel Grant: HPCA 2025
- Qualcomm Innovation Fellowship (QIF), Finalist, 2024
- Cornell Graduate Fellowship, 2022
- NTU Singapore Undergraduate Dean's List (top 5% of the cohort), 2015 – 2017
- Singapore Science and Engineering Undergraduate Scholarship, 2015 – 2019

INVITED TALKS

- **Efficient Computing In-memory Architectures for FPGA-based Deep Learning Acceleration**
 - FCCM'23, Los Angeles, CA, May 2023
 - FPT'23, Japan, Dec. 2023
 - Centre for Spatial Computational Learning (SpatialML), Online, Mar. 2024
- **Leveraging Bit-serial Computation for Deep Learning Acceleration**
 - Samsung AI Research Cambridge, Online, Jul. 2024
 - MICRO'24, Austin, TX, Nov. 2024
 - Southeast University, China, Dec. 2024
- **BitMoD: Bit-serial Mixture-of-Datatype LLM Acceleration**
 - Qualcomm AI Research, San Diego, CA, Nov. 2024
 - Intel Research Review, Online, Nov. 2024
 - HPCA'25, Las Vegas, NV, Mar. 2025
 - Computer Architecture Day @ Columbia University, New York, May 2025

EDITORIAL SERVICE

- **Journal Reviewer**

IEEE Transactions on Computers (TC)
IEEE Transactions on Circuits and Systems I: Regular Papers (TCAS-I)
IEEE Transactions on Very Large Scale Integration Systems (TVLSI)
IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS)

- **Conference Secondary Reviewer**

International Symposium on Field-Programmable Gate Arrays (FPGA), 2024
Design Automation Conference (DAC), 2023

- **Artifact Evaluation Committee**

International Symposium on High-Performance Computer Architecture (HPCA), 2025