Yonghao Tan CV

Yonghao Tan

- Address: HKUST, Clear Water Bay, Hong Kong, China
- Phone: +852 53946864
- E-mail: ytanaz@connect.ust.hk, yonghaot1017@gmail.com
- Personal Homepage: https://yonghao-tan.github.io/

Education & Academic Performance

- **Ph.D. in Electronic and Computer Engineering**, The Hong Kong University of Science and Technology (HKUST), Hong Kong, China (Sept. 2023 - Present)
  Supervised by Prof. Tim Kwang-Ting CHENG.
- **B.E. in Microelectronics**, Southern University of Science and Technology (SUSTech), Shenzhen, Guangdong, China (Sept. 2019 - Jun. 2023)
  Supervised by Prof. Fengwei An.
- Overall GPA: **3.77 / 4.0**
- Weighted Average Score: **90.38**
- Rank: **11 / 77**

Research Interests

- Software/hardware co-design
- Model compression
- 3D processing

Research Experience

SLAM-Based Co-Design Embodied AI Chip

- **Date:** Jan. 2025 - Present
- **Affiliation:** AI Chip Center for Emerging Smart Systems, Hong Kong, China
- **Mentor:** Prof. Tim CHENG Kwang-Ting
- Integrate SLAM into a novel embodied AI system.
- Co-design exploration of heterogenous SLAM and AI computing core design.

Hybrid Bonding Based Co-Design AI Accelerator

- **Date:** Apr. 2024 - Present
- **Affiliation:** AI Chip Center for Emerging Smart Systems, Hong Kong, China
- **Mentor:** Prof. Tim CHENG Kwang-Ting
- Co-design optimization for LLMs.
- Implement the AI-core and ReRAM with 55nm die-on-wafer stacking via bumping process.

Transformer Based Co-Design AI Accelerator

- **Date:** Nov. 2021 - Sept. 2024
- **Affiliation:** AI Chip Center for Emerging Smart Systems, Hong Kong, China
- **Mentor:** Prof. Tim CHENG Kwang-Ting
- Hardware/software collaborative optimization of Transformer-based architecture.
- Implement an energy-efficient Transformer-based accelerator for semantic segmentation with 28nm ASIC process.

Publications

- **2026** Tan, Y.*, Ma, S.*, Dong, P., Luo, P., Lei, Z., Lu, W., Ying, G., ... & Cheng, K. T.
  A 5nm 91.43 TOPS/W 4-Chiplet Generalizable-Rendering-Processor with UCIe-Enabled Cross-Die-Cache and

Balance-Aware Progressive Multi-Level Sparsity.
In 2026 IEEE Custom Integrated Circuits Conference (CICC), IEEE.

- **2026** Dong, P., Tan, Y., Liu, X., Luo, P., Liu, Y., Pang, D., Ma, S., ... & Cheng, K. T.
  A 14.08-to-135.69Token/s ReRAM-on-Logic Stacked Outlier-Free Large-Language-Model Accelerator with Block-Clustered Weight-Compression and Adaptive Parallel-Speculative-Decoding.
  In 2026 IEEE International Solid-State Circuits Conference (ISSCC), IEEE.
- **2025** Dong, P.*, Tan, Y.*, Liu, X., Luo, P., Liu, Y., Liang, L., ... & Cheng, K. T.
  A 28nm 0.22uJ/Token Memory-Compute-Intensity-Aware CNN-Transformer Accelerator with Hybrid-Attention-Based Layer-Fusion and Cascaded Pruning for Semantic-Segmentation.
  In 2025 IEEE International Solid-State Circuits Conference (ISSCC), IEEE.
- **2024** Dong, P.*, Tan, Y.*, Zhang, D., Ni, T., Liu, X., Liu, Y., ... & Cheng, K. T.
  Genetic Quantization-Aware Approximation for Non-Linear Operations in Transformers.
  In 2024 61st ACM/IEEE Design Automation Conference (DAC), IEEE.
- **2022** Tan, Y.*, Deng, H.*, Sun, M., Zhou, M., Chen, Y., Chen, L., ... & An, F.
  A Reconfigurable Coprocessor for Simultaneous Localization and Mapping Algorithms in FPGA.
  IEEE Transactions on Circuits and Systems II: Express Briefs, 70(1), 286-290.
- **2022** Tan, Y.*, Sun, M.*, Deng, H., Wu, H., Zhou, M., Chen, Y., ... & An, F.
  A Reconfigurable Visual-Inertial Odometry Accelerated Core with High Area and Energy Efficiency for Autonomous Mobile Robots.
  Sensors, 22(19), 7669.

* Authors marked with an asterisk contributed equally to the corresponding work.

Honors and Awards

- Oct. 2022: First-class Outstanding Students Scholarship (Top 5% in SUSTech)
- May 2022: Successful Participant in Mathematical Contest in Modeling
- Dec. 2021: Shenzhen Longsys Electronics Company Award (Top 2% in School of Microelectronics)
- Dec. 2021: First Prize, 2021 National College Students FPGA Innovation Design Competition (Top 22 in 1341 teams)
- Oct. 2021: First Prize, 2021 International Competition of Autonomous Running Robots (Top 1 of 34 teams in final match)
- Oct. 2021: Second-class Outstanding Students Scholarship
- Mar. 2021: Third Prize, 2020 Asia and Pacific Mathematical Contest in Modeling
- Oct. 2020: Second-class Outstanding Students Scholarship

Fundings

- Sept. 2023 - Present: Postgraduate Studentship (PGS) Award in HKUST
- Apr. 2022: Undergraduate Innovation and Entrepreneurship Training Programs (Provincial Level)
- Jul. 2021: Guangdong College Students’ Scientific and Technological Innovation (Provincial Level)

Skills

- Programming language: C, C++, Java, Python, System Verilog, Verilog HDL, VHDL
- Professional software: AutoCAD, Cadence, Design Compiler, IC Compiler II, MATLAB, Multisim, Silvaco

Languages

- English (fluent), Mandarin (native), Cantonese (native)