

Yu-Tung Liu

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Research Interests

AI Hardware / Software Co-Design, Machine Learning Accelerators, and Digital Circuit Design

Education

National Yang Ming Chiao Tung University (NYCU)

Hsinchu, Taiwan

B.S. Electronics and Electrical Engineering (Cumulative GPA: 3.86/4.3, Last two year GPA: 4.05/4.3)

Sept. 2022 – June 2024

Graduate Level Coursework: Digital Integrated Circuits (A+), Machine Learning Intelligent Chip Design (A), Computer Architecture (A)

Research & Professional Experiences

Academia Sinica - Bio-ASP Lab, Research Center for Information Technology Innovation

Taipei, Taiwan

Research Assistant (with Dr. Yu Tsao)

Nov. 2024 – Present

Research Intern (with Dr. Yu Tsao)

July 2023 – July 2024

- Introduced a generative method and a state space model to surface electromyography denoising framework - both methods generated denoised signals of 4% and 14% higher quality respectively compared to the previous method

Republic of China Army Conscription

Yilan, Taipei, Taiwan

- Finished military training and joined the defense of Guandu Area Command

July – Nov. 2024

NYCU -VLSI/SoC Design Automation Lab

Hsinchu, Taiwan

Undergraduate Research Assistant (with Prof. Hung-Ming Chen)

Sept. 2023 – June 2024

- Proposed an IR drop estimation method that includes comprehensive feature extraction and a convolution neural network and validated it with an open-source dataset; the method can make accurate predictions with an average error of 0.053mV without computational overhead

NYCU, ADAR Lab

Hsinchu, Taiwan

Undergraduate Research Assistant (with Prof. Juinn-Dar Huang)

Sept. 2022 – June 2023

- Refined the machine learning image processing procedure for polyp detection and improved the performance from 60% to 84%
- Designed a Convolution Neural Network for 3D brain vascular segmentation that achieved 95% accuracy
- Built an FPGA real-time fall detection and online alarm system with a pose estimation transformer accelerator

Publications

Liu, Y. T., Wang, K. C., Liu, K. C., Peng, S. Y., & Tsao, Y. (2024, April). SDEMG: Score-Based Diffusion Model for Surface Electromyographic Signal Denoising. In ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 1736-1740). IEEE.

Liu, Y. T., Cheng, Y. H., Wu, S. Y., & Chen, H. M. (2024, Oct.). CFIRSTNET: Comprehensive Features for Static IR Drop Estimation with Neural Network. In ICCAD 2024 ACM/IEEE International Conference on Computer-Aided Design (ICCAD).

Liu, Y. T., Wang, K. C., Chao, R., Siniscalchi, S. M., Yeh, P. C., & Tsao, Y. (2024). MSEMG: Surface Electromyography Denoising with a Mamba-based Efficient Network. In ICASSP 2025-2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP).

Yu, C. A., Liu, Y. T., Cheng, Y. H., Wu, S. Y., Chen, H. M., & Kuo, C. C. J. (2025). GIRD: A Green IR-Drop Estimation Method. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 2025.

Honors

Chu-Ming Medical Foundation: Chih-Tung Yin Electronics Laboratory Scholarship (NT\$30,000)

June 2024

1st Place Award, IEEE ICCAD 2023 CAD Contest

Oct. 2023

2nd Place, IEEE ISBI 2023 SHINY-ICARUS Challenge

May 2023

Judges' List Award, Ministry of Education 2023 Intelligent SoC Innovative Project Contest

Aug. 2023

People's Choice Award, NYCU Electrical Engineering Project (2x)

Jan., June 2023

Selected Projects

MIPS Single Core Central Processing Unit

Jan. 2024

- Designed a CPU with multiple pipeline stages and caches from RTL to APR with Cadence tools and UMC 0.18 μ m CMOS technology

Music Genre Recognition Chatbot

June 2024

- Utilized a Neural Network backend to develop a Telegram chatbot that replied to users' queries about the genre of the input music

Leadership and Extracurricular Activities

Student Association | Student Activities Director

2022 – 2023

- Integrated planning of numerous student events to cultivate strong relationships among members

Tutoring

Sept. 2020 – June 2024

- Developed and implemented customized learning strategies for junior and senior high school students on math, physics, and chemistry

Programming Languages

Verilog, System Verilog, C/C++, Python