

EUGENE LEE

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Cincinnati, Ohio

SUMMARY

Researcher in computer vision and multimodal systems with interests in representation learning, token-efficient VLMs, agentic pipelines, and robust perception for real-world interaction.

Recent founder chapter focused on applied research and large-scale systems (instance retrieval, GraphRAG indexing, and scan-to-dialog agents), complementing peer-reviewed work.

Skill: PyTorch, Python, TypeScript/JavaScript, React, C/C++, CUDA, Verilog, Node.js, AWS, Docker, iOS, Android, SQL, Redis

EDUCATION

National Yang Ming Chiao Tung University, Hsinchu

September 2017 - July 2023

Ph.D. in Electronics Engineering, GPA: 4.0/4.0

National Chiao Tung University, Hsinchu

August 2013 - June 2017

B.S. in Electronics Engineering

WORK EXPERIENCE

University of Cincinnati, Ohio

August 2024 – Present

Postdoctoral Researcher, College of Medicine

- Built imaging pipelines for organelle dynamics, including segmentation, temporal modeling, and unsupervised analysis to accelerate biology workflows.
- Research on in-context learning with Large Language Models to assess drug effects on lysosomes and relate MXene nanoparticle concentration to ER structural damage in SIM datasets.

[Paidge, Inc.](#)

January 2024 – Present

Founder

- Created an object-intelligence platform to index physical assets at scale and enable scan-based, conversational interaction. Completed 3 pilots with museums in Greater Cincinnati area; maintained a 20+ customer waitlist.
- Designed a proprietary multi-frame aggregation model on a Perception Encoder with FAISS for efficient instance retrieval.
- Re-engineered a lightweight GraphRAG for high-throughput indexing (millions of objects). Integrated with Gemma 3 and deployed using vLLM for user-facing object interaction.

National Yang Ming Chiao Tung University, Hsinchu

August 2023 – July 2024

Postdoctoral Researcher, Institute of Electronics

- Led design of a BioFPGA platform integrating an in-house 180 nm CMOS ASIC (TSMC) with Raspberry Pi for on-device nucleic acid amplification testing (NAAT), enabling programmable microfluidic control, real-time on-chip thermal control, and real-time assay readout in a single portable device.
- Directed an architectural study on vision-language pipelines in large language models to improve vision token efficiency, reducing token footprint and end-to-end latency across microscopy and general VLM workloads.

[Advanced Bio Chips](#), Hsinchu

August 2023 – July 2024

CEO

- Co-led BioFPGA commercialization while at NYCU, securing approximately \$1M in dilutive funding from Taiwan's Ministry of Economic Affairs to advance the platform from prototype toward field trials.
- Built cross-functional execution across IC design, embedded software, and bioassay teams; delivered milestones on ASIC bring-up, firmware integration, microfluidic control, and thermal cycling validation.

Crystal Lake, Hsinchu

August 2018 – August 2019

Data Analyst, Side Project

- Designed temporal access modeling for SSD controllers to optimize read/write scheduling, improving throughput and power efficiency while reducing write amplification and extending projected device lifespan under mixed workloads.

OneWork, Taipei

May 2019

Data Engineer, Side Project

- Built a YOLO-based smoke and flame detection pipeline for remote surveillance as a drop-in enhancement over conventional alarms, covering dataset curation, model training, and thresholding for high-recall early hazard alerts under low-light and occlusion.

TEACHING EXPERIENCE

Introduction to VLSI Design

2019 Fall

Head Teaching Assistant

Instructor: Chen-Yi Lee

- This course aims to convey junior EE students techniques to analyze and design system by means of VLSI technology and CAD tools. Starting from VLSI process technology and transistor's behavior.

Integrated Circuit Design Laboratory

2018 Spring / 2017 Fall

Head Teaching Assistant / Teaching Assistant

Instructor: Chen-Yi Lee

- This course aims to convey the senior and graduated EE students techniques to design the VLSI chips using state-of-the-art CAD tools. In addition to learning CAD tools for performance-driven and cost-effective IC designs, a top-down design flow and related environment will also be addressed.

Introduction to Machine Learning

2018 Spring

Teaching Assistant

Instructor: Chen-Yi Lee

- This course introduces the fundamental concepts and algorithms that enable computers to learn from experience, with an emphasis on their practical application to real problems.

ACADEMIC ACHIEVEMENTS

Publications

h-index: 6; Citations: 423

Journal

- Chen, Rui, Eugene Lee, Yuxin Wang, Aditya Yadav, Minling Zhong, Pragti, Yujie Sun, and Jiajie Diao. **A Versatile NearInfrared Fluorescent Probe for Fast Assessment of Lysosomal Status via a Large Multimodal Model.**, Aggregate: e70118, 2025.
- Yadav, Aditya, Eugene Lee, Rui Chen, Soryong R. Chae, Yujie Sun, and Jiajie Diao. **Understanding the Role of Polyethylene Glycol Coating in Reducing the Subcellular Toxicity of MXene Nanoparticles Using a Large Multimodal Model.**, Materials Today Bio (2025): 102372.
- Wang, Yuxin, Yun-Sheng Chan, Eugene Lee, Donglu Shi, Chen-Yi Lee, and Jiajie Diao, **Monitoring Escherichia Coli in Water through Real-Time Loop-Mediated Isothermal Amplification on Biochips**, Micromachines, vol. 15, no. 9, 2024, article 1112.

- Eugene Lee and Chen-Yi Lee, **PPG-Based Smart Wearable Device with Energy-Efficient Computing for Mobile Health-care Applications**, IEEE Sensors Journal, vol. 21, no. 12, pp. 13564-13573, 15 June, 2021, doi: 10.1109/JSEN.2021.3069460.

Conference

- Hsieh, Cheng-Hsuan, Eugene Lee, Jiajie Diao, Chen-Yi Lee, **M*: On-Chip Microfluidic Operations with A* for Portable Diagnostics**, In Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), 2025.
- Eugene Lee, Lien-Feng Hsu, Evan Chen and Chen-Yi Lee, **Cross-Resolution Flow Propagation for Foveated Video Super-Resolution**, In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**), January 2023
- Eugene Lee, Cheng-Han Huang and Chen-Yi Lee, **Few-Shot and Continual Learning with Attentive Independent Mechanisms**, In Proceedings of the International Conference on Computer Vision (**ICCV**), October 2021
- Eugene Lee, Evan Chen and Chen-Yi Lee, **Meta-rPPG: Remote Heart Rate Estimation Using a Transductive Meta-Learner**, In Proceedings of the European Conference on Computer Vision (**ECCV**), August 2020
- Eugene Lee and Chen-Yi Lee, **NeuralScale: Efficient Scaling of Neurons for Resource-Constrained Deep Neural Networks**, In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), June 2020 (**Oral**)
- Eugene Lee, Annie Ho, Yi-Ting Wang, Cheng-Han Huang and Chen-Yi Lee, **Cross-Domain Adaptation for Biometric Identification Using Photoplethysmogram**, International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), May 2020
- Eugene Lee, Tsu-Jui Hsu and Chen-Yi Lee, **Centralized State Sensing Using Sensor Array on Wearable Device**, International Symposium on Circuits and Systems (**ISCAS**), May 2019
- Eugene Lee, Tsu-Jui Hsu and Chen-Yi Lee, **Continuous Blood Glucose Monitoring on Wearable Device using Photoplethysmography**, NSF IoT Workshop (**ICCAD**), Nov 2018

Awards

- Founder University Cohort 11 (LAUNCH Pre-Accelerator), 2025
- [Future Tech Awards, 2024](#)
- Draper University Fundamentals of Entrepreneurship 2022
- Novatek Ph.D. Fellowship, 2020~2022
- Recipient of Broadcom Foundation Scholarship, 2019
- 3rd place in Synopsys ARC Contest, 2017
- Award recipient of International ICCAD Contest, 2016

Academic Service

- Reviewer: CVPR [2022: 2; 2023: 3; 2025: 2], ICCV [2025: 4], ECCV [2022: 3; 2024: 1], NeurIPS [2025: 2], WACV [2026: 2], DeepMTL@ICCV [2021: 1], TCAS II [2020: 3].
- Talk: “*Semiconductor Chips for Fast Medical Testing*” at the 2024 Taiwan-Malaysia Semiconductor Forum, Kuala Lumpur, Malaysia.
- [Talk](#): “*Going Beyond Neural Architecture Search for Efficient Training and Inference*” at Academia Sinica, 2020.
- Talk: “*NeuralScale: Efficient Scaling of Neurons for Resource-Constrained Deep Neural Networks*” at National Taiwan University, 2020.

PATENTS

Lee, Chen-Yi, and Eugene Lee. **Video display systems, portable video display apparatuses and video enhancement methods.** U.S. Patent 12,211,174, issued January 28, 2025.

Lee, Chen-Yi, Eugene Lee, and Tsu Jui Hsu. **Physiological sensing method and device using the same.** U.S. Patent Application 16/441,801, filed July 23, 2020.