

Cheng-Hao Chen (Ryan Chen)

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Education

Purdue University

Master of Science in Electrical and Computer Engineering

West Lafayette, IN

Expected May 2027

- **GPA: 3.9** | **Relevant Coursework:** Artificial Intelligence, Deep Learning, Machine Learning

National Cheng Kung University

Bachelor of Science in Computer Science and Information Engineering

Tainan, Taiwan

May 2024

- **GPA: 3.7** | **Relevant Coursework:** Algorithms, Data Structures, Operating Systems

Research Focus

My research centers on efficient image restoration, with a primary focus on optimizing High Dynamic Range (HDR) denoising pipelines. I leverage techniques such as knowledge distillation to streamline complex models for highly efficient inference.

Additionally, my previous work explores the broader applications of Generative AI, specifically utilizing diffusion models for image synthesis and computational photography.

Core Areas of Expertise:

- **Computer Vision & Image Processing:** Vision Transformers, Computational Photography
- **Deep Learning & Generative AI:** Diffusion Models, GANs, Efficient Transformer Architectures & Optimization

Technical Skills

- **Languages & Tools:** Python, C++, C, Git, Docker, Bash Shell (Linux)
- **Deep Learning:** PyTorch, Hugging Face, JAX
- **Data Science:** Pandas, NumPy, Scikit-Learn

Experience

School of Electrical and Computer Engineering, Purdue University

Graduate Teaching Assistant

West Lafayette, IN / Remote

Jan 2024 – Dec 2025

- **ECE513 Fourier Optics and Digital Cameras (Aug 2025 – Dec 2025):** Mentored graduate students through advanced principles of Fourier optics and digital image sensor physics, including scalar diffraction, CMOS noise modeling, and image formation dynamics.
- **ECE50024 Machine Learning (Aug 2024 – May 2026):** Guided over 160 graduate students through various machine learning concepts on weekly office hours, formulating and grading exams and a project.
- **ECE30200 Probability (Jan 2024 – May 2024):** Mentored a cohort of 190+ undergraduate students during weekly office hours, providing technical support and grading assessments.

Intelligent Imaging Lab, Purdue University

Instructor, Machine Learning for Beginners

Remote

Jun 2024 – Jul 2024

- Instructed over 40 high school (10th-12th grade) and college freshman students on the foundational mechanics of gradient descent, backpropagation, and regularization.
- Designed and developed comprehensive instructional materials and assessments for hands-on technical projects.

Select Projects

HDR Image Denoising Model Optimization

Jan 2026 – Present

- Engineered a highly efficient HDR denoising model utilizing knowledge distillation.
- Achieved a 87x reduction in total model parameters and a 25.1x speedup in FPS, significantly improving inference performance capabilities up to real-time.

Thermal Camera Image Sensor Non-Uniformity Calibration

Aug 2025 – Jan 2026

- Researched and implemented the DeepIR framework to computationally recover high-quality thermal images from low-cost microbolometers.
- Developed a working pipeline to separate static sensor non-uniformities from moving scene radiance by combining an explicit physical device model with an unsupervised CNN (Deep Image Prior).

DIFFUSEFACES - Forensic Face Sketch Generator

Jun 2022 – May 2023

- Built a Stable Diffusion-based image generator to assist law enforcement in forensic facial imaging (Ranked 4th/80 at senior exhibition).
- Trained the architecture on 15,000 FFHQ images and 15,000 StyleGAN3 generated faces, fine-tuning the model via LoRA.

AI in Music - Robot Cello

Jan 2024 – Jun 2024

- Developed a robotic arm system programmed to interpret MIDI files and play the cello autonomously.
- Implemented an LSTM-based kinematic model to accurately predict and execute bowing trajectories.