




ERIC CHEN

Los Angeles, CA 90034

✉ contact@mehlc.com  [linkedin.com/in/eric-chen-h](https://www.linkedin.com/in/eric-chen-h)  github.com/hlc1209  [Google Scholar](#)

EDUCATION

University of California, Los Angeles (UCLA)

Ph.D., Electrical and Computer Engineering, GPA 4.0

Los Angeles, CA

Expected 2026

University of Southern California (USC)

M.S., Electrical Engineering MS Honors Program, GPA 3.95

Los Angeles, CA

December 2020

PROJECTS

Foundation Model for Computational Pathology and Virtual Staining | Deep Learning

Present

- Developed first-of-its-kind Auto-fluorescence Foundation Model for Computational Pathology and Virtual Staining
- Engineered robust PyTorch data pipeline handling ~7TB of pathological images, reducing data loading time by 90%
- Managed and optimized distributed training processes on an 8-A100 GPU cluster using Slurm and PyTorch DDP
- Collaborated with 15+ pathologists, researchers and engineers to accelerate development and medical validation

Diffusion Model-Based Consistent Super-Resolution Image Translation | Deep Learning

October 2024

- Designed novel diffusion model-based super resolution virtual staining system, eliminating chemical staining needs
- Achieved state-of-the-art 5× super-resolution performance through Brownian bridge-based diffusion architecture
- Invented advanced sampling techniques for diffusion models through variance analysis, reducing output instability by up to 63% with enhanced image fidelity and clinical reliability

Optical Generative Models | Deep Learning

October 2024

- Architected world's first optical generative model, attaining 56% computation reduction in FLOPs while maintaining deep learning-comparable generation quality through hardware-software co-optimization
- Developed iterative optical generation framework producing 200k+ diverse facial images, captured by RGB camera during experiments

Fourier Imager Network (FIN): A Neural Network with Superior External Generalization | Deep Learning

August 2022

- Pioneered groundbreaking neural network by innovating custom-designed Spatial Fourier Transform Modules, allowing unprecedented global receptive field processing for complex patterns
- Spearheaded first-ever end-to-end system for complex hologram reconstruction, delivering a 27× speedup over gold standard and ~10× over SOTA deep learning models while maintaining fidelity, empowering real-time applications
- Revolutionized external generalization through pure Fourier domain processing, securing robust performance on entirely unseen data distributions where SOTA models exhibit systematic failure

GedankenNet: Self-supervised Learning Based on Physics Laws and Thought Experiments | Deep Learning

August 2023

- Innovated self-supervised neural network leveraging physics-informed learning and non-laboratory data, eliminating dependencies on large-scale, high-quality labeled datasets
- Engineered breakthrough zero-shot imaging system enabling direct generalization to diverse experimental holograms with 24% quality improvement over SOTA supervised models

eFIN: Generalizable Autofocusing and Super-Resolution in Holographic Imaging | Deep Learning

July 2023

- Pioneered first-of-its-kind end-to-end holographic imaging network powering simultaneous autofocusing and super-resolution through novel attention mechanisms and dynamic feature extraction
- Surpassed SOTA performance by achieving 30% higher reconstruction quality while reducing input dimensions by 9x

Fluent Handwriting HID Using Embedded Deep Learning on Microcontrollers | Embedded System

December 2021

- Developed a real-time handwriting recognition system by customizing a highly efficient CNN for Arduino Nano 33 BLE Sense, achieving 95.4% accuracy on embedded devices with touch user interface
- Implemented RTOS-based firmware and resolved TensorFlow Lite Micro quantization issues, enabling seamless deployment of deep learning models on resource-constrained microcontrollers without performance compromises
- Engineered a portable device with custom PCB design and 3D-printed enclosure, integrating low-power hardware and Bluetooth Low Energy (BLE) protocol for seamless user interaction and broad device compatibility

- C-RNN: Convolutional Recurrent Neural Network for High-dimensional Image Reconstruction** | *Deep Learning* **March 2021**
- Designed C-RNN specialized for high-dimensional image reconstruction from sparse, low-dimensional measurements
 - Developed pipeline for volumetric imaging and segmentation of *C. elegans* using C-RNN and Mask R-CNN
- RT-NRVE: Real-time Noise Reduction and Voice Enhancement using Deep Learning** | *Deep Learning* **May 2020**
- Engineered deep learning solution handling both stationary and non-stationary noise, demonstrated through 11k+ voice samples with 10 noise types, establishing new benchmarks against Wavenet and RNNoise
 - Architected novel cascade CNN-RNN framework and custom data preprocessing pipeline, facilitating real-time voice processing and performance breakthrough across 0-15dB signal-to-noise ratio
- A Cloud Computing Based Optoelectronic Tweezer Control System** | *Software Development* **August 2018**
- Engineered wireless control system for optoelectronic tweezers with cross-platform interface on portable devices
 - Structured cloud-based real-time image processing and object detection backend using C++/OpenCV and WebSocket

EXPERIENCE

HHMI Undergraduate Research and Training Program

Los Angeles, CA

Mentor

September 2021 - Present

- Spearheaded high-impact mentorship program for 4 undergraduates, resulting in 5 interdisciplinary research projects through structured daily guidance and weekly hands-on training sessions
- Architected and delivered advanced technical curriculum that supported students in mastering image processing, computational biophotonics, and ML techniques within 3 months
- Orchestrated cross-functional collaboration between postdoctoral scholars, senior graduate students, and undergraduate teams, leading to 5 public presentations at UCLA research labs open day
- Managed full research lifecycle from initial training to final presentations, ensuring 100% project completion and research excellence within 3 academic quarters

University of Southern California

Los Angeles, CA

Research Assistant

September 2019 - August 2021

- Collaborated with 5 senior researchers and co-authored a pioneering research paper on complex network analysis, resulting in a high-impact publication with 47 citations
- Led and managed a team of 6 researchers to collect and annotate 15,000+ social media posts containing COVID-19 truths/rumors for natural language processing
- Engineered automated data collection and cleaning pipeline using Python, regex patterns, and social media APIs, leading to 80% reduction in manual data processing time

TECHNICAL SKILLS

Languages: Python, Java, C/C++, MATLAB, JavaScript, HTML

Technologies/Frameworks: PyTorch, TensorFlow 1.x/2.x, JAX, Keras, Scikit-learn, Hugging Face, Lightning, OpenCV, ReactJS, Qt

Developer Tools: VS Code, Git, Docker, Jupyter, Android Studio, Xcode, Google Cloud Platform, AWS

PUBLICATIONS (SELECTED)

- Chen, H.**, Huang, L., Liu, T., & Ozcan, A. (2022). Fourier Imager Network (FIN): A deep neural network for hologram reconstruction with superior external generalization. *Light: Science & Applications*, 11(1), 254. **(Citation 72. US Patent Pending)**
- Chen, S., Li, Y., **Chen, H.**, & Ozcan, A. Optical Generative Models. **(Submitted to Nature under peer review. US Patent Pending)**
- Chen, H.**, Huang, L., Liu, T., & Ozcan, A. (2023). eFIN: enhanced Fourier imager network for generalizable autofocusing and pixel super-resolution in holographic imaging. *IEEE Journal of Selected Topics in Quantum Electronics*, 29(4: Biophotonics), 1-10.
- Huang, L., **Chen, H.**, Luo, Y., Rivenson, Y., & Ozcan, A. (2021). Recurrent neural network-based volumetric fluorescence microscopy. *Light: Science & Applications*, 10(1), 62. **(Citation 40)**
- Huang, L.[‡], **Chen, H.**[‡], Liu, T., & Ozcan, A. (2023). Self-supervised learning of hologram reconstruction using physics consistency. *Nature Machine Intelligence*, 5(8), 895-907. **(Citation 33)**
- Xiao, X.[‡], **Chen, H.**[‡], & Bogdan, P. (2021). Deciphering the generating rules and functionalities of complex networks. *Scientific reports*, 11(1), 22964. **(Citation 47)**

[‡] These two authors contributed equally