

# Haomin (Harmin) Qi

[harminchee.github.io](https://harminchee.github.io)

## EDUCATION

### University of California San Diego

M.S. in Electrical and Computer Engineering  
GPA: 3.8 /4.0

Sep. 2025 – Jul. 2027

La Jolla, CA

### The Chinese University of Hong Kong

B.S. in Mathematics and Information Engineering  
Double Major Graduation | Elite Stream Class

Sep. 2021 – Jul. 2025

Hong Kong SAR

### University of Leeds

Abroad Exchange in Computer Science  
GPA: 4.00 /4.00 | First Class Honour

Jan. 2024 – Jul. 2024

Leeds, UK

## PUBLICATIONS

### TopoEdge: An Edge-assisted LLM Framework for Automated SDN Configuration Generation

Haomin Qi, Yuyang Du, Ziheng Kang, Yue Zhan, Soung Chang Liew

*Under review at The IEEE Wireless Communications and Networking Conference 2026 (IEEE WCNC 26')*

### VeriRAG: A Retrieval-Augmented Framework for Automated RTL Testability Repair

Haomin Qi, Yuyang Du, Lihao Zhang, Soung Chang Liew, Kexin Chen, Yining Du

*Under review at The 27th International Symposium on Quality Electronic Design (ISQED 26')*

### Governance-Aware Hybrid Fine-Tuning for Multilingual Large Language Models

Haomin Qi, Chengbo Huang, Zihan Dai, Yunkai Gao

*The 2025 IEEE International Conference on Big Data Workshop LLM4All (IEEE BigData 25'LLM4All)*

### GraphCue for SDN Configuration Code Synthesis

Haomin Qi, Fengfei Yu, Chengbo Huang

*IEEE Consumer Communications & Networking Conference 2026 (IEEE CCNC 26')*

### Hybrid and Unitary PEFT for Resource-Efficient Large Language Models

Haomin Qi, Zihan Dai, Chengbo Huang

*The American Journal of Computer Science and Technology (AJCST)*

### Transforming ABA Therapy: An IoT-Guided, Retrieval-Augmented LLM Framework

Haomin Qi, Chung-Ho Sin, Rosanna Yuen-Yan Chan, Victor Chun-Man Wong

*IEEE Access Journal*

## EXPERIENCE

### Shang Data Lab, UC San Diego

Sep. 2025 – Present

Research Assistant | Supervisor: Jingbo Shang

La Jolla, CA

- Designed the **BenchInject** framework by linking execution traces with structured function indices, enabling automatic retrieval of target code regions and controlled insertion of fault patterns. Established a unified pipeline covering parsing, trace mapping, candidate extraction, and code rewriting
- Developed an end-to-end verification workflow that integrates LLM-guided modification with automated compilation and test execution. Demonstrated reliable bug activation and failure detection across large Java projects, providing a reproducible platform for evaluating LLM behavior in real software environments

### Advanced Wireless Systems Group, CUHK

Apr. 2024 – Sep. 2025

Research Assistant | Supervisor: Soung Chang Liew

Hong Kong SAR

- Led the **VeriRAG** program, designing a retrieval-augmented generation (RAG) framework that integrates LLMs with Verilog compilation workflows to automatically detect and repair DFT-related errors, significantly improving accuracy in clock-domain crossing and scan-chain validation
- Developed **TopoEdge**, a topology-aware SDN configuration framework leveraging GNN-based contrastive learning and distributed LLM inference across edge devices, enabling efficient configuration repair and automated validation inside FRRouting's Topotest environment
- Led the long-term **full-stack development** and maintenance of the laboratory website, utilizing HTML, CSS, JavaScript, and backend integration to ensure continuous updates, professional presentation of research outcomes, and reliable access to resources

## Deloitte

Sep. 2024 – Dec. 2024

Machine Learning Application Intern

Hong Kong SAR

- Developed the IoT-guided **ABA-RAG** framework, integrating multimodal sensor data (BVP, GSR, temperature, acceleration) with structured ABA task repositories. Achieved 73% classification accuracy and 0.90 recall in detecting key behavioral states, enabling more adaptive and context-aware task generation
- Deployed the system as a web-based platform with task retrieval, IoT feedback integration, and performance analytics dashboards. Supported 10 learners in pilot trials, with expert evaluation scores averaging 9.63/10, confirming effectiveness on par with traditional practitioner-led ABA interventions

## Wireless Ad-Hoc & Sensor Networks Lab, NCU

Jun. 2024 – Sep. 2024

Research Intern | Supervisor: Min-Te Sun

Taoyuan, TW

- Proposed and implemented a Hybrid Fine-Tuning framework that dynamically integrates LoRA-GA and BOFT updates per layer, achieving near full fine-tuning accuracy while reducing training time by  $2.1\times$  and GPU memory usage by 50% on Llama3 models
- Extended unitary recurrent neural network (uRNN) principles into transformer-based LLMs, embedding structured unitary matrices into attention and feedforward layers to enhance gradient stability and convergence, particularly for long-range reasoning tasks

## R-Guardian

May. 2023 – Oct. 2023

Machine Learning Engineer

Hong Kong SAR

- Developed AI-powered trademark search engine integrating image feature extraction, template matching, and reverse image search capabilities to enable accurate similarity analysis across global trademark databases
- Engineered scalable database system and cloud computing framework to process massive trademark data from multiple national IP offices, optimizing for real-time search and analysis capabilities

## Artificial Intelligence & Computer Vision Lab, NYCU

Jun. 2023 – Aug. 2023

Research Intern | Supervisor: Jun-Wei Hsieh

Taipei, TW

- Contributed to research group developing DeepMAD framework, formulating mathematical programming approach to optimize CNN architecture design through entropy maximization and effectiveness constraints

## Embedded AI & IoT Lab, CUHK

May. 2022 – Aug. 2022

Software Development Intern | Supervisor: Guoliang Xing

Hong Kong SAR

- Developed and tested data acquisition software for Smart Mobile Health Systems project (SMHS), implementing multi-threaded sensor data collection and real-time signal processing modules with 97.1% data transmission reliability across 60+ deployment sites

## PROJECTS

### ArtTouch: Visual Art Recognition System

Spring 2025

- Developed multi-stage image processing pipeline integrating CLAHE contrast enhancement, Gabor filtering, and ESRGAN upscaling to optimize artwork digitization, achieving edge detection and texture preservation for 3D model generation
- Implemented adaptive bilateral filtering system with Sobel and Canny edge detection algorithms to enhance tactile feature recognition, enabling precise texture pattern reproduction for visually impaired art appreciation

### Intell-Pro Global Startup - Operations Director

Fall 2024

- Founded and served as CEO of Intell-Pro Global Limited, developing AI-powered trademark search engine serving law firms and IP agencies across US, Europe, and Asia markets.
- Led company strategy and financing initiatives, securing TSSSU funding (HK\$675,000) and HK Tech300 Entrepreneurship Award, while establishing partnerships with major IP law firms and trademark agencies for market expansion

### Marine Heatwaves and Seagrass Resilience: A Machine Learning Analysis

Winter 2023

- Developed ML-based framework to analyze controlled experimental datasets of *Halophila beccarii* and *Halophila ovalis*, applying supervised models to identify key physiological and ecological indicators of thermal stress resistance
- Revealed species-specific resilience patterns under marine heatwaves, providing insights into ecosystem conservation strategies and advancing predictive modeling of climate-change impacts on seagrass communities

## SKILLS

**Languages:** Python, C, Java, JavaScript, SQL, R, P4, Shell Script, HTML

**Frameworks:** PyTorch, TensorFlow, Hugging Face, OpenCV, FastAPI, MLflow, Git

**Cloud & Tools:** Azure ML, AWS, CUDA, Docker, OpenAI API, LangChain

**ML/DL:** Transformer, BERT, LLaMA, RAG, LoRA, PEFT, CNN/RNN, Self/Semi-Supervised Learning