Muquan Yu

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Education

The Chinese University of Hong Kong *Sep 2022 – Jun 2026*

GPA: 3.952/4.0 BSc in Computer Science

Computer Vision, Computational Neuroscience, Deep Learning, Machine Learning, Bioinformatics, Computer Algorithms, Computer Theory, Computer Organization, Programming, Advanced Mathematics and Statistics

Research Experiences

Research Assistant Sep 2025 – Now

Professor Yizhou Yu *University of Hong Kong*

- Working on a novel and efficient computer vision backbone model inspired by human visual perception system.

Research Assistant Nov 2024 – Now

Professor Andrew Luo *University of Hong Kong*

- Designed a meta in-context learning brain encoder to predict neural activation patterns in the human visual cortex. First author paper accepted by *NeurIPS 2025*.
- Designed a brain decoder model for image reconstruction from neural data using a transformer-based cross-modal framework. Co-first author paper submitted to *CVPR 2026*, under review.

Research Assistant Summer 2025

Professor Adeel Razi *Monash University, Australia*

- Designed a transformer-based deep learning model to align biological and artificial neural representations across vision and audio modalities. First author paper preparing for submission to *TNNLS*.

Research Assistant Jan 2024 – May 2025

Professor Jinwei Gu *Chinese University of Hong Kong*

- Contributed to curating a large-scale 4K dataset of synchronously captured images from diverse camera devices.
- Contributed to designing a deep learning-based camera image signal processing (ISP) unification model. Co-author paper accepted by *Transactions on Image Processing*.

Research Assistant May 2024 – Nov 2025

Professor Yu Li *Chinese University of Hong Kong*

- Designed a deep learning framework combining attention mechanisms with nucleotide language models for RNA epitranscriptomic modification prediction. Co-first author paper submited to *Research in Computational Molecular Biology*, under review.

Publications and Patents

[1] **Muquan Yu**, Mu Nan, Hossein Adeli, Jacob S Prince, John A Pyles, Leila Wehbe, Margaret M Henderson, Michael J Tarr, and Andrew F Luo*. "Meta-Learning an In-Context Transformer Model of Human Higher Visual Cortex". In: *Advances in Neural Information Processing Systems 2025*.

[2] Mu Nan†, **Muquan Yu**†, Jacob S. Prince, Hossein Adeli, Rui Zhang, Jiahang Cao, Benjamin Becker, John A. Pyles, Margaret Marie Henderson, Chunfeng Song, Nikolaus Kriegeskorte, Michael J. Tarr, Xiaoqing Hu, and Andrew F. Luo*. "Meta-Learning In-Context Enables Training-Free Cross Subject Brain Decoding". In: *arXiv 2025*. (†: co-first author).

[3] Li Lingen, Mingde Yao, Xingyu Meng, **Muquan Yu**, Tianfan Xue*, and Jinwei Gu*. "Uni-ISP: Unifying the Learning of ISPs from Multiple Cameras". In: *IEEE Transactions on Image Processing 2025*.

[4] Jiuming Wang†, **Muquan Yu**†, and Yu Li*. "Precise nucleotide-level RNA modification prediction with deep learning and language model". In: *Research in Computational Molecular Biology 2025*. (Under review. †: co-first author).

[5] **Yu Muquan**, Chang Tianchi, Lai Xinye, and Xiao Zhuoling. "Intelligent recognition method for cluster scenarios based on graph optimization（基于图优化的集群场景智能认知方法）". Patent Application CN2024115430928A. (Application Filed). 2024.

[6] Niu Shiran, Li Sijia, **Yu Muquan**, and Yang Yuran. "Indoor-Outdoor Fusion Positioning Method Based on Inertial Navigation Integration（一种基于惯导融合的室内外融合定位方法）". Patent Application CN118548878A. (Published). 2024.

[7] Qin Haojie, Dai Yuquan, Fang Yukun, **Yu Muquan**, and Peng Zhuolin. "Dynamic Reconfigurable System Design Method Based on FPGA（一种基于FPGA的动态可重构系统设计方法）". Patent Application CN116911218A. (Published). 2023.

Competition Experiences

ROBOCON 2024 | *Member of CUHK ROBOCON robot team* Sep 2023 – Jan 2024

- As a member of CUHK robot team, built and programmed robots with motor and camera functionalities.
- Developed computer vision algorithms for pattern recognition, e.g. identifying objects based on color and contour.
- Implemented autonomous capabilities for the robots to approach and pick up recognized objects.

CUMCM 2023 | *National Second Prize* | *Team leader* Sep 2023

- Team (3-members) leader in the Contemporary Undergraduate Mathematical Contest in Modeling competition of China in 2023, received National Second Prize.
- Led research and developed a mathematical model for Hydrographic survey route planning.
- Implemented and validated the model using Java and Python. Demonstrated strong problem-solving abilities, effective teamwork, and proficiency in mathematical modeling and programming.

Project Experiences

Web-based Second-Hand Trading Platform Jan 2025 – May 2025

- A web-based platform for users to buy and sell second-hand items.
- Developing features including product searching, sorting, private chatting, payment processing, and user rating.
- Using Python Django to manage the system, MySQL for the backend database, HTML/CSS for frontend UI design and PHP for generating dynamic content.

Memory Managing System Based on Dynamic Hash Table Sep 2023 – Dec 2023

- Designed and implemented a memory management system using dynamic hash tables to optimize the allocation and deallocation of computer memory.
- Developed memory allocation algorithms with low amortized time complexity for address-based requests.
- Designed a new data structure called anchor point array to achieve low time complexity for locating memory blocks containing specific addresses.

Web-based Course Registration System Sep 2022 – Dec 2022

- Designed a web-based system for course registration and applicant information management.
- Developed functionalities for applying to courses, updating applicant information, and managing course quotas.
- Used PHP for server-side logic and MySQL for database management, HTML for form creation and UI display.

AI Board Game Suite Sep 2022 – Dec 2022

- Built a terminal-based suite of 8 classic games with AI opponents: Othello, Tic-Tac-Toe, Connect Four, Checkers, Minesweeper, Blackjack, Poker, and Go Fish.
- Designed modular game engine with clean ASCII interface, supporting both human-vs-AI and multiplayer modes.

Honors and Awards (selected)

- **National Second Prize, Contemporary Undergraduate Mathematical Contest in Modeling** 2023
- **HKSAR Government Talent Development Scholarship** 2025
- **CUHK CSE Yao Fellowship** (2 awardees, highest honor in CSE department). 2025
- **Professor Charles K. Kao Research Exchange Scholarship** (7 awardees in CUHK) 2025
- **CUHK Academic Excellence Scholarship for Non-local Fee-paying Students** 2025
- **Hong Kong Chiu Chow Association Scholarships** 2024
- **CUHK CSE Award for Academic Excellence** (top 3%) 2024
- **CUHK Prof. Omar Wing Memorial Scholarship** (top 1 in major) 2023
- **CUHK Engineering Faculty Dean's List** (top 10%) 2023, 2024, 2025