

Mukai Yu (Tom Notch)

UNDERGRADUATE · PASSIONATE ROBOTICIST · INTEGRATIVE SYSTEMS AND DESIGN · COMPUTER SCIENCE · DOUBLE MAJOR

📍 HKUST Jockey Club Hall, 3 Tong Yin Ln, Tseung Kwan O, Kowloon, Hong Kong, China

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Personal Statement

I've participated in dozens of robotics competitions since elementary school (FFL, WRO, RJC, FRC), and have been extremely passionate about robotics ever since. My goal has always been to develop reliable and intelligent robots for humankind. To achieve it, I've mastered a wide range of skill sets, from CAD modeling, manufacturing, to embedded programming, web development, and deep learning. Having shown competence in various job positions that involve many group projects, I'm undoubtedly a team player and a quick learner, and I'm open to all kinds of opportunities to enrich my experience.

Education

🏛 Hong Kong University of Science and Technology

BSC IN INTEGRATIVE SYSTEMS AND DESIGN, COMPUTER SCIENCE

- GPA: 3.62/4.30

Hong Kong, China

September 2019 - present

🏛 University of Illinois at Urbana-Champaign

NON-DEGREE EXCHANGE IN COMPUTER SCIENCE

- GPA: 3.90/4.00

Urbana, IL, U.S.A

January 2022 - May 2022

🏛 Shenzhen Middle School

HIGH SCHOOL DIPLOMA

- Honor Curriculum
- Gaokao Track

Shenzhen, Guangdong, China

September 2016 - July 2019

Honors

2022	Reaching Out Award, HKSAR Government Scholarship Fund	\$ 1,250
	Shui On Innovation Fund Student Awards, Shui On Innovation Fund	\$ 1,250
2021	Dean's List (top 5%), HKUST	
2019	DJI RoboMaster Scholarship (top 10%), HKUST & DJI	\$ 20,000
	University Scholarship, HKUST	\$ 3,000

Experience

Huawei - Hong Kong Research Center - Design Automation Lab

SUPERVISOR: **WILSON**


- Participate in software development of EDA design verification via emulation on FPGA
- Research on multiprocessor scheduling algorithm for EDA netlist

Science Park, Hong Kong, China

Sept 2023 - Nov 2023

Carnegie Mellon University - The Robotics Institute - the AirLab

SUPERVISOR: **PROFESSOR SEBASTIAN SCHERER**


- Publish IEEE IROS paper and release thermal image dataset for object detection
 - WIT-UAS: A Wildland-Fire Infrared Thermal Dataset to Detect Crew Assets from Aerial Views
- Lead hardware and perception algorithm development of [the WildFire Project](#) 
- Redesign and manufacture Open Research Drone
- Develop and deploy SSD object detection deep learning model on NVIDIA Jetson Xavier with hardware acceleration

Pittsburgh, PA, U.S.A

Jan 2023 - Aug 2023

Carnegie Mellon University - The Robotics Institute

SUPERVISOR: **DR. PENG YIN & DR. JI ZHANG**

- Implemented Online VIO System with Map Prior  on Boston Dynamics Spot
- Related work: VINS-Mono, FAST-LIO, Sequence SLAM, omnidirectional camera
- Mastered ROS in 1 week

Pittsburgh, PA, U.S.A

May 2022 - Aug 2022

Hong Kong University of Science and Technology - Dept of CSE

SUPERVISOR: **PROFESSOR DAN XU**

- Researched in real-time 3D reconstruction SLAM unsupervised deep learning algorithms
- Compared depth estimation results on different unannotated video datasets
- Reported algorithm summary of 10+ papers

Hong Kong, China

May 2021 - Aug 2021

Professional Experience

DJI Robomaster Robotics Summer/Winter Camp

RUNNER-UP TEAM  7

- Participated consecutively **4 cohorts**: 2018 winter & summer, 2019 winter & summer
- Lead Embedded, Software, and Mechanical development, **captain** last time
- Built robots with Mecanum wheel Omnidirectional chassis and pneumatic actuator **from scratch in 2 weeks**

Shenzhen, China

Jan 2018 - Aug 2019

Extracurriculum

HKUST ENTERPRIZE Robomaster Robotics Team 20+

SENIOR SOFTWARE ENGINEER

- Built quaternion mathematical library for rigid transformation
- Implemented robust IMU complementary filter and stabilization Gimbal algorithm

Hong Kong, China

Sept 2019 - Feb 2020

Projects

WildFire

HARDWARE AND PERCEPTION **LEAD**  10+

- Supervisor: **Professor Sebastian Scherer**
- Burning-time wildfire mapping and prediction system with UAV swarm
- Field-tested at real local prescribed fire sites with Pittsburgh Fire Department

Pittsburgh, PA, U.S.A

Jan 2023 - Aug 2023

Lighthouse (year-long project)


CAPTAIN OF DEVELOPMENT TEAM  3

- Supervisor: **Professor Ajay JONEJA**
- Interactive & Intuitive Indoor Navigation System
- Built power-efficient signage unit with BLE, WiFi, and LCD panel
- Designed and deployed website for user interaction with signage unit
- Private Github Repository available on demand

Hong Kong, China

Sept 2020 - May 2021

VAN€ (year-long project)

CAPTAIN OF DEVELOPMENT TEAM  4

- Supervisor: **Professor Winnie Suk Wai LEUNG**
- vision-based professional indoor workout assistant app
- Applied 3D pose estimation deep learning algorithm and online computation

Hong Kong, China

Sept 2020 - May 2021

Course Work

COMP 5222 Advanced Machine Learning with Graphs

- Topics: Graph-based semi-supervised learning, Network embedding, Graph neural networks, Graph and subgraph isomorphism, Knowledge Graphs

HKUST

2023 Fall

COMP 6411B Advanced Topics in 2D and 3D Deep Visual Scene Understanding

HKUST

2022 Fall

- Topics: Semantic Segmentation, Depth Estimation, 2D/3D Object Detection, Multi-Task Learning, 3D Scene Reconstruction, Implicit Representation Learning, Visual SLAM

COMP 4421 Image Processing

HKUST

2022 Fall

- Topics: Image Filtering, Compression, Segmentation, Registration, Morphological Processing, Description, Recognition

CS 498 Machine Perception

UIUC

A+

2022 Spring

- Topics: SLAM, 3D reconstruction, Object Detection, Bayesian Filter

CS 446 Machine Learning

UIUC

A-

2022 Spring

- Topics: discriminative models, generative models, reinforcement learning models

CS 425 Distributed Systems

UIUC

A-

2022 Spring

- Topics: distributed transactions, consensus, mutual exclusion, concurrency control

COMP 5411 Advanced Computer Graphics

HKUST

A-

2021 Fall

- Topics: 3D model representation & manipulation, rendering, GPU computing
- Rendering Project: [Music Visualizer](#) 

Skills

Programming, C/C++ · Python (NumPy & PyTorch) · Javascript · HTML · CSS · GLSL

Software, Ubuntu · ROS · Docker · Solidworks · Web Development · Mobile Applications · vSLAM

Language, Mandarin Chinese (Native) · English (TOEFL: 104/120 with Speaking 28/30)

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