

Mukai Yu (Tom Notch)

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

📍 HKUST, Kowloon, Hong Kong, China

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Education

🏛 Carnegie Mellon University

MS IN ROBOTICS

Pittsburgh, PA, USA

September 2024 - 2026

🏛 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 - 2024

🏛 University of Illinois at Urbana-Champaign

NON-DEGREE EXCHANGE IN COMPUTER SCIENCE

• GPA: 3.90/4.00

Urbana, IL, USA

January 2022 - May 2022

🏛 Shenzhen Middle School

HIGH SCHOOL DIPLOMA

- Honor Curriculum
- Gaokao Track

Shenzhen, Guangdong, China

September 2016 - July 2019

Honors

2024	HKSTP Tech FYP Sponsorship , Hong Kong Science and Technology Parks	100,000 HKD
2022	Reaching Out Award , HKSAR Government Scholarship Fund	10,000 HKD
	Shui On Innovation Fund Student Awards , Shui On Innovation Fund	10,000 HKD
2021	Dean's List (top 5%) , HKUST	
2019	DJI RoboMaster Scholarship (top 10%) , HKUST & DJI	150,000 HKD
	University Scholarship , HKUST	25,000 HKD

Publications

ACCEPTED

Andrew Jong, **Mukai Yu**, Devansh Dhrafani, Siva Kailas, Brady Moon, Katia Sycara, Sebastian Scherer. WIT-UAS: A Wildland-Fire Infrared Thermal Dataset to Detect Crew Assets from Aerial Views. *International Conference on Intelligent Robots and Systems (IROS)*, 2023

Experience

Huawei - Hong Kong Research Center - Design Automation Lab

SUPERVISOR: **WILSON**

Science Park, Hong Kong, China

Sept 2023 - Jan 2024


- Participate in software development of EDA netlist design verification via hardware emulation on processor cluster
- Related work: Parallel Bubble Scheduling and Allocation, Critical Path Fast Duplication, Parallel Genetic Algorithm

Carnegie Mellon University - The Robotics Institute - the AirLab

Pittsburgh, PA, U.S.A

SUPERVISOR: **PROFESSOR SEBASTIAN SCHERER**

Jan 2023 - Aug 2023


- 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

Carnegie Mellon University - The Robotics Institute

Pittsburgh, PA, U.S.A

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

May 2022 - Aug 2022

- 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

Hong Kong University of Science and Technology - Dept of CSE

Hong Kong, China

SUPERVISOR: **PROFESSOR DAN XU**

May 2021 - Aug 2021

- 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

Professional Experience

DJI Robomaster Robotics Summer/Winter Camp

Shenzhen, China

RUNNER-UP TEAM  7

Jan 2018 - Aug 2019

- 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**

Extracurriculum

HKUST ENTERPRIZE Robomaster Robotics Team 20+

Hong Kong, China

SENIOR SOFTWARE ENGINEER

Sept 2019 - Feb 2020

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

Projects

BIPV Facade Mounting Robotics

Hong Kong, China

ROBOTICS SOFTWARE **LEAD**  5

Sept 2023 - May 2024

- Supervisor: **Professor Chi Ying TSUI**
- Robotic automatic mounting of PV(solar) panels on building facades
- Funded **100,000 HKD** by HKSTP Tech FYP Sponsorship

WildFire

Pittsburgh, PA, U.S.A


HARDWARE AND PERCEPTION **LEAD**  10+

Jan 2023 - Aug 2023

- 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

Lighthouse (year-long project)

Hong Kong, China

CAPTAIN OF DEVELOPMENT TEAM  3

Sept 2020 - May 2021

- 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

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

ELEC 5660 Introduction to Aerial Robotics

HKUST

PROJECT: GNN FOR SPARSE VISUAL FEATURE MATCHING

2024 Spring

- Topics: Rigid Body Transformation, Quaternion, Quadrotor Control, Trajectory Generation, Path Planning, Feature Detection & Matching, Optical Flow, Dense Stereo, Bayesian Inferencing, Extended & Augmented State EKF, Particle Filter, SLAM

COMP 5222 Advanced Machine Learning with Graphs

HKUST

PROJECT: GNN FOR SPARSE VISUAL FEATURE MATCHING

2023 Fall

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

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

HKUST

PROJECT: 3D RECONSTRUCTION FROM DEEP INFERENCE DEPTH

2022 Fall

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

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) · MATLAB · 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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