

Mukai Yu

UNDERGRADUATE STUDENT · INTEGRATIVE SYSTEMS AND DESIGN · COMPUTER SCIENCE · DOUBLE MAJOR

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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 participated in 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

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

Research Experience

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
- IEEE TIE Paper to be submitted
- 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

Shenzhen, China

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+

SENIOR SOFTWARE ENGINEER

Hong Kong, China

Sept 2019 - Feb 2020

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

Projects

Lighthouse 📄 (year-long project)

CAPTAIN OF DEVELOPMENT TEAM 🧑‍🤖 3

Hong Kong, China

Sept 2020 - May 2021

- Supervisor: **Professor Ajay JONEJA**
- Developed a Camera-based professional indoor workout assistant app
- Applied 3D pose estimation deep learning algorithm and online computation

VAN€ (year-long project)

CAPTAIN OF DEVELOPMENT TEAM 🧑‍🤖 4

Hong Kong, China

Sept 2020 - May 2021

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

Course Work

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

UNDERGOING

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

UNDERGOING

HKUST

2022 Fall

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

CS 498 Machine Perception

A+

UIUC

2022 Spring

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

CS 446 Machine Learning

A-

UIUC

2022 Spring

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

CS 425 Distributed Systems

A-

UIUC

2022 Spring

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

COMP 5411 Advanced Computer Graphics

A-

HKUST

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, ROS · Android Studio · Solidworks · Rhino · Blender · Meshlab

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

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