Tae Hyeon Kweon

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Research Interests

Robot manipulation, Perception, Motion and Control, Robot Learning, Sensor Fusion, Robot Mechanism and Design

Education

The Hong Kong Polytechnic University Kowloon, Hong Kong

Bachelor of Engineering (Honors) in Mechanical Engineering September 2018 – June 2024 (expected)

- GPA: 3.41/4.3 (**Top 3%** of the class)
- Mandatory military duty (leave of absence) September 2021 – June 2023

Research & Work Experience

Robotics and Machine Intelligence Lab, The Hong Kong Polytechnic University Kowloon, Hong Kong

Advisor: Dr. David Navarro-Alarcon

Undergraduate Student Researcher September 2023 – Present

- Developing manipulation planning and motion control for the dual-arm robot TIAGo++.

Undergraduate Research Assistant December 2020 – June 2021

- Developed a mobile robotic system capable of autonomous navigation on liquid and mud surfaces [*].
- Developed a vision-based localization and navigation system with the detection of artificial markers.
- Designed and fabricated a 3D-printed robotic gripper equipped with tactile sensors for the UR5 arm.

Origami Labs (Start-up) Tsuen Wan, Hong Kong

Engineering Intern July 2020 – September 2020

- Developed automatic microphone activation depending on the device orientation with an accelerometer.
- Implemented a low-pass filter to reduce noise in a noisy environment.

MAV/UAV Lab, The Hong Kong Polytechnic University Kowloon, Hong Kong

Student Assistant March 2020 – June 2020

Advisor: Prof. WEN Chih-Yung

- Assisted with the research on VTOL (Vertical Take-Off and Landing) UAV system for air pollution measurement.
- Assembled VTOL UAVs and supported on-site flight operations.

Research Grant

Contributions to Ongoing Funded Research

June 2021 – May 2024

Project Title: Automation of the Solar-driven Salt Production [*]
Co-Principal Investigator (25%): Dr. David Navarro-Alarcon, Associate Professor; Samantha Lee, PhD
Funding: Jiangsu Province Science and Technology Plan Project Grants, 800,000RMB
Role: Co-author and Technical Contributor
My work on the Mobile Robotic System for Salt Pond project served as the basis for this grant.
Collaborated with Dr. David and Dr. Lee in writing and obtaining the grant.

Academic Projects

Final Year Capstone Project September 2023 – Present

Advisor: Dr. Henry CHU

- Designing a mobile robot with an active suspension system for automated navigation in uneven terrain.
- Developing a real-time environment mapping system with sensors and a stereo camera
- Developing decision-making (AI) algorithms for the optimization of object delivery routes.

Rugby Kicking Robot September 2020 – May 2021

- Designed, prototyped, and demonstrated a rugby-kicking robot capable of navigating through obstacles.
- Successfully designed a kicking mechanism that allowed the robot to kick the ball over a hurdle.

Scholarships & Honor

Undergraduate Research Program Scholarship, The Hong Kong Polytechnic University (HK$10,000) 2023

Dean's Honor List 2020/21 2021

Full Entry scholarship, The Hong Kong Polytechnic University 2018 – 2024

Extracurricular Activities

Mentoring Program, Korean Student Association, The Hong Kong Polytechnic University Sept 2023 – Present

Team leader, STEM Learning Kits for Overseas Students June 2020 – August 2020

- Led a team in designing and prototyping a hydraulic lamp to facilitate teaching in hydraulics and electricity.
- Delivered 18 hours of educational activity via Zoom to students in Vietnam and Cambodia.

Member, Tech4D (Technology for Development) April 2020 – May 2020

- Designed and implemented touch-free automatic hand gel dispensers throughout the campus.
- Distributed mask cases and disinfectant products to students.

Technical Skills

Programming language	Python, C++, MATLAB
Framework	ROS, OpenCV, NumPy, PyTorch
Hardware	IMU, Lidar, Depth Camera (D455), Microcontroller (Arduino), Embedded computer (RaspPi)
Mechanical	CAD (SolidWorks), Rapid prototyping (3D printing, laser cutting)