

CHEUNG Hiu Ching, Athena

MPhil Year 2 Student

Aeronautical and Aviation Engineering

The Hong Kong Polytechnic University

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🌐 <https://github.com/HKPolyU-UAV>

🌐 <https://github.com/Athenachc>

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EDUCATION

- **The Hong Kong Polytechnic University (HKPolyU)** 2022-now
Master of Philosophy (Passed Confirmation of Registration)
 - Thesis title: Design and Control of a Soft Aerial Vehicle for Conducting Aerial Grasping
 - Supervised by Prof. Chih-yung WEN (AAE) and co-supervised by Dr Henry K. CHU (ME)
 - affiliated with the High-speed Thermo-fluid and MAV/UAV Lab (AIRo Lab) at the Research Centre for Unmanned Autonomous Systems (RCUAS)
 - Relevant TA duty: 1) PolyU CubeSat Mission - Space Debris Removal (Feb to Apr 2023): mentored secondary students to finish their CubeSat and final presentation. 2) Astron: Space Lab - STEM programme (Nov to Dec 2023): mentoring secondary students to utilize Python programming and computer vision techniques to calculate the velocity of the International Space Station.
- **The Hong Kong Polytechnic University** 2018-2022
Bachelor of Engineering (Honours) in Mechanical Engineering
 - Dean list (2019/2020)
 - FYP title: Development of an Aerial Air Quality Monitoring Platform Based on Vertical Takeoff and Landing (VTOL) Unmanned Aerial Vehicle (UAV) (Supervised by Prof. Chih-yung WEN)
 - Virtual summer exchange: Girton College, Cambridge - Mathematics for Engineering Online Summer Programme, 2021
 - Relevant TA duty: PolyU Junior Research Mentoring Programme (May to Aug 2021): mentored secondary students to guide and encourage them in exploring research opportunities.

PUBLICATION

- **H. C. Cheung**, B. Jiang, Y. Hu, H. K. Chu, C.-Y. Wen, and C.-W. Chang, "Aerial grasping with soft aerial vehicle using disturbance observer-based model predictive control," (*submitted to IEEE Robotics and Automation Letters*) 2024. [Online]. Available: <https://arxiv.org/abs/2409.14115>
- **H. C. Cheung**, C.-W. Chang, B. Jiang, C.-Y. Wen, and H. K. Chu, "A modular pneumatic soft gripper design for aerial grasping and landing," *2024 IEEE 7th International Conference on Soft Robotics (RoboSoft)*, San Diego, CA, USA, 2024, pp. 82-88, doi: 10.1109/RoboSoft60065.2024.10521918.
- C.-W. Chang, L.-Y. Lo, **H. C. Cheung**, Y. Feng, A.-S. Yang, C.-Y. Wen, and W. Zhou, "Proactive guidance for accurate uav landing on a dynamic platform: A visual-inertial approach," *Sensors*, vol. 22, no. 1, p. 404, 2022.

AWARDS AND SCHOLARSHIP

- **HKSAR Government Scholarship Fund - Endeavour Merit Award** 2018/19 - 2023/24
- **The Hong Kong Jockey Club Scholarships - Undergraduate Scholarship**
 - The Hong Kong Jockey Club 2019/20 - 2021/22
- **BEA Inspiring Student Scholarship**
 - Bank of East Asia 2019/20
- **Best Engineering Design Award** The Robocon 2019 Hong Kong Contest
 - Hong Kong Science and Technology Parks Corporation 2019
- **HKSAR Government Scholarship Fund - Talent Development Scholarship** 2018/19 - 2019/20
- **Two Champion; Four 1st Runner-up; Three 2nd Runner-up** International Robotic Olympic 2017
 - Hong Kong Robotic Olympic Association 2017

- **(Senior Group) Second Prize; Best Design Award** Fun Science Competition 2017 “Stay right there”
- Hong Kong Science Museum 2017
- **Hong Kong Top 10 Outstanding Teens Award** Hong Kong Outstanding Teens Election
- Hong Kong Playground Association and The Outstanding Young Persons’ Association 2016

WORK EXPERIENCE

- **The Hong Kong Polytechnic University** May 2023 - Aug 2024
Project Technical Assistant (Part-time) | Supervisor: Prof. Chih-yung WEN MAV/UAV Laboratory
 - Has associated with the research project “Research Centre for Unmanned Autonomous Systems” (P0046487)
 - Providing technical support for 3D printing
 - Providing technical support for mechatronics design
- **Hong Kong Center for Construction Robotics** Jan 2023 - Jun 2023
Research Assistant (Part-time)
 - Provided technical support for 3D printing
 - Designed the mechanical structure of products and drawing the 3D CAD drawings
- **The Hong Kong Polytechnic University** Sep 2022 - May 2023
Project Assistant (Part-time) | Supervisor: Prof. Chih-yung WEN MAV/UAV Laboratory
 - Had associated with the research project “Research Centre for Unmanned Autonomous Systems” (P0046487)
 - Provided technical support for composite manufacturing (Carbon fiber airframes)
 - Provided technical support for 3D printing
- **Hong Kong Center for Construction Robotics** Jun 2022 - Aug 2022
Student Helper (Full-time)
 - Joined one of the existing start-up teams, which is focusing on construction robots
 - Designed the mechanical structure of products and drawing the 3D CAD drawings
- **The Hong Kong Polytechnic University** Aug 2021 - May 2022
Student Assistant (Part-time) | Supervisor: Prof. Chih-yung WEN MAV/UAV Laboratory
 - Had associated with the research project "Trial: Development of Vertical Take-Off and Landing (VTOL) Unmanned Aerial Vehicle (UAV) for Air Quality Monitoring in Greater Bay Area" (K-ZPJU)
 - Provided technical support for 3D printing
 - Designed the mechanical structure of a movable landing platform for UAVs and controlled its movement with Arduino programming
- **The Hong Kong Polytechnic University** Dec 2020 - Jul 2021
Student Assistant (Part-time and Full-time) | Supervisor: Dr Henry Kar Hang CHU Biomimetic Robotics Laboratory
 - Automated pick-and-place task with object recognition using deep learning
 - Applied vision-based control for a robot arm (UR5) and conducted system calibration to ensure precise control
 - Incorporated deep learning techniques, specifically Convolutional Neural Networks (CNN), for grasping random objects
- **Carmel Divine Grace Foundation Secondary School** Sep 2018 - Aug 2020
Robotics Team Coach (Part-time) Hong Kong
 - Led students to participate in International Robotic Olympiad 2019
 - Taught students how to use CAD (Computer Aided Drawing) (2D: CorelDRAW and 3D: SolidWorks)
 - Taught students how to build robots with DC gear motors, servo motors, and micro-controllers

VOLUNTEER SERVICES AND EXTRA-CURRICULAR ACTIVITIES

- **Wooden Boat Crafting Skills - Intern**, The Warehouse Teenage Club *Jun 2024 - now*
 - Wooden Boat Crafting Skills - Intangible Cultural Heritage Documentation and Promotion Project
 - Engaged in learning and participating in the process of wooden boat crafting to ensure compliance with relevant safety standards and requirements.
 - Involved in documenting the craft of wooden boat making, meticulously recording the production process and various details.
 - Participated in promoting wooden boat crafting skills to enable a wider audience to understand and appreciate the art of wooden boat making and its associated historical and cultural values.
- **Judge and Organizer**, Hong Kong Robotics Club *Apr 2018 - now*
 - Demonstrated judgment in the Hong Kong Robotic Olympiad and International Robotic Olympiad
 - Tutoring in InnoTech Workshops in InnoCarnival (since 2013)
 - Contributing to the preparation and event follow-ups
- **Internal Vice President**, Outstanding Teens Association (Hong Kong) *Oct 2020 - Aug 2024*
 - Contacting and promoting events to OTA members
 - Handling Financial management
 - Coordinating internal administration and organizing external voluntary services (e.g., University Simulations in 2021 (<https://skmdonaldshek.wixsite.com/hkotausims2021>) and 2022 (<https://skmdonaldshek.wixsite.com/hkotausims2022>))
- **Team member**, HKPolyU Unmanned Aerial Vehicles Team *Sep 2019 - Aug 2022*
 - Had been prepared for UAV Challenge –Medical Rescue:
 - A mechanical structure was designed to release a ground vehicle from a fixed-wing VTOL
 - Developed a geofence system design for the fixed-wing VTOL
 - Built a fixed-wing VTOL (vertical take-off and landing) unmanned aerial vehicle with postgraduate teammates (Mini Talon: <https://youtu.be/ELSqvWizsCc>, start from 00:57-01:50)
 - Designed the mechanical structure of UAVs
- **Vice President (Executive)**, Outstanding Teens Association (Hong Kong) *Aug 2018 - Sep 2020*
 - Led the team of the Academic and Development Committee to plan and organize a Peer to Peer Programme (P2P X STEM) for all students in primary schools and secondary schools in Hong Kong
 - Contacting with other student leaders and teachers to promote P2P X STEM
 - Sharing personal experience on STEM (robotics) in P2P X STEM
- **Leader of the Team, Crimson**, HKPolyU FENG Robotics Club *Oct 2018 - Oct 2019*
 - Chief designer of Manual Robot 1 (A multi-tasking robot with several types of actuators)
 - Designer of the rack of compressed air tank for pneumatic cylinders
 - Won Best Engineering Award in the Robocon 2019 Hong Kong Contest
- **Hong Kong Young Ambassador**, Hong Kong Young Ambassador Scheme *Oct 2016 - May 2021*
 - Contributing voluntary service (local service to promote Hong Kong tourism)
 - Helped in Tourism Promotional Events (e.g. 2019 Cathay Pacific International Chinese New Year Night Parade, Hong Kong Well-wishing Festival, Restpiration - The Feast, etc.)

TECHNICAL SKILLS AND INTERESTS

Languages: English, Cantonese, Mandarin

CAD & CFD: AutoCAD, CorelDRAW, Fusion 360, SOLIDWORKS, TinkerCAD, Ansys Fluent

Programming language libraries & Frameworks: Arduino, C++, Python, ROS, OpenCV, ArduPilot, PX4, TensorFlow, micro:bit, MIT App Inventor

Areas of Interest: roller skating, badminton, football, piano, guitar, dizi (Chinese flute), building robots, reading

- **Interview Video, Student Affairs Office @ PolyU**

Jun 2022

SEN Students' Sharing

- A Big Fan of Robotics [Link][Video]

- **News articles, Ming Pao**

Jul 2018 - Aug 2018

Exceptional personal endeavour

- Motivated by my resolute determination to pursue a career in engineering, I successfully overcame childhood illness and the obstacle of hearing loss, which shattered my aspirations of becoming a pilot. Despite encountering personal challenges, including my father's hospitalization due to a stroke the day before the pivotal HKDSE Examination, I persevered and achieved satisfactory results, providing me with the opportunity to pursue engineering studies at my preferred university. [Link]
- Following up on the previous news articles, I had ultimately obtained admission to PolyU Mechanical Engineering. [Link]

- **News articles, Wen Wei Po**

Jun 2016

2016 Hong Kong Top 10 Outstanding Teens Award

- List of 2016 Hong Kong Top 10 Outstanding Teens Award [Link]
- Despite being diagnosed with moderate to severe hearing loss, I persevered and adapted my aspirations, excelling in robotics competitions and earning recognition as one of Hong Kong's Top 10 Outstanding Teens. [Link]