

# CHEUNG Hiu Ching, Athena

Robotics Researcher

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## EDUCATION

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### • The Hong Kong Polytechnic University (HKPolyU) 2022-2025

*Master of Philosophy (Aeronautical and Aviation Engineering)*

- 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)

### • 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

## PUBLICATION

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- **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," (*Preprint*) 2024. [Online]. Available: <https://doi.org/10.48550/arXiv.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

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- **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
- **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

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- **The Hong Kong Polytechnic University** Jan 2025 - now

*Research Administrative Assistant (Full-time)* AIRO Laboratory

  - Associating with the project "Research Centre for Low Altitude Economy" (4-CE0Q)
  - Assisting with a book ("New Space: From Low Earth Orbit to the Moon and Beyond") that is to be published, addressing tasks such as formatting the citations and reference lists, modifying the diagrams

• **Pigeon City | Omnilearning ECA Center | Intelligent Software Co Ltd**

Oct 2024 - Feb 2025

STEM Tutor (Part-time)

- Teaching STEM courses: UAV swarm, LEGO EV3

• **The Hong Kong Polytechnic University**

May 2023 - Aug 2024

Project Technical Assistant (Part-time) | Supervisor: Prof. Chih-yung WEN

AIRO Laboratory

- Had associated with the research project “Research Centre for Unmanned Autonomous Systems” (P0046487)
- Provided technical support for 3D printing
- Provided 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 drew the 3D CAD drawings

• **The Hong Kong Polytechnic University**

Sep 2022 - May 2023

Project Assistant (Part-time) | Supervisor: Prof. Chih-yung WEN

AIRO 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 drew the 3D CAD drawings

• **The Hong Kong Polytechnic University**

Aug 2021 - May 2022

Student Assistant (Part-time) | Supervisor: Prof. Chih-yung WEN

AIRO 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 - Jun 2020

Robotics Team Coach (Part-time)

Hong Kong

- Led students to win in the 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

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• **Judge and Organizer, Hong Kong Robotics Club**

Apr 2018 - now

- Demonstrating 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

• **Wooden Boat Crafting Skills - Intern, The Warehouse Teenage Club**

Jun 2024 - now

- 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.
- **Internal Vice President, Outstanding Teens Association (Hong Kong)** *Oct 2020 - Aug 2024*
  - Contacted and promoting events to OTA members
  - Handled Financial management
  - Coordinated internal administration and organized external voluntary services (e.g., University Simulations in 2021 (<https://skmdonaldshek.wixsite.com/hkotasims2021>) and 2022 (<https://skmdonaldshek.wixsite.com/hkotasims2022>))
- **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/ELSqvWizCc>, start from 00:57-01:50)
- **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, Respiration - The Feast, etc.

## TECHNICAL SKILLS AND INTERESTS

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**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, LEGO EV3, Tello TT

## MEDIA

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- **Interview Video, Student Affairs Office @ PolyU** *Jun 2022*  
*SEN Students' Sharing*
  - A Big Fan of Robotics  
[https://www.polyu.edu.hk/sao/student-resources-and-support-section/special-needs-support/students-sharing/athena\\_a-big-fan-of-robotics/](https://www.polyu.edu.hk/sao/student-resources-and-support-section/special-needs-support/students-sharing/athena_a-big-fan-of-robotics/)  
<https://youtu.be/Oj3ewcWgY5c?si=zkdg8hLiU-TVv13f>
- **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.

[[https://www.mingpaocanada.com/tor/htm/News/20180712/HK-gbm\\_r.htm](https://www.mingpaocanada.com/tor/htm/News/20180712/HK-gbm_r.htm)]

- Following up on the previous news articles, I had ultimately obtained admission to PolyU Mechanical Engineering.

[[https://www.mingpaocanada.com/VAN/htm/News/20180807/HK-gaa1\\_r.htm](https://www.mingpaocanada.com/VAN/htm/News/20180807/HK-gaa1_r.htm)]

#### • 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

[<http://paper.wenweipo.com/2016/06/29/ED1606290003.htm>]

- 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.

[<http://paper.wenweipo.com/2016/06/29/ED1606290001.htm>]