Ching-Hsiang Wu

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EDUCATION

National Taiwan University

Master of Science, Automatic Control in Electrical Engineering Taipei, Taiwan
- **Overall GPA: 4.19/4.30** Feb. 2025
- Relevant Courses: Optimal Control(**A+**), Reinforcement Learning(**A+**), 3D Computer Vision with Deep Learning Applications(**A**)

Bachelor of Science, Biomechatronics Engineering Taipei, Taiwan
- **Overall GPA: 3.39/4.30** Feb. 2022
- Relevant Courses: Dynamics and Control of Robots(**A**) Automatic Control(**A**), Digital Control Systems(**A**), Adaptive Control Systems(**A**), Digital Image Processing(**A-**)

SKILLS

Programming: Python, C/C++, Qt, MATLAB, WebDev Languages.
Software: SolidWorks, Simulink, Gazebo, Rviz, Isaac Sim, Qt designer, ROS/ROS2.
Controller: Raspberry pi, Arduino, Nvidia TX2/Xavier, Pixhawk series, PX4.
Artificial Intelligent: Deep learning (Yolo, CNN), Reinforcement learning (DQN, PPO).

RESEARCH EXPERIENCE

Networked Control System Laboratory (NCSLab)

Graduate student Taipei, Taiwan
Feb. 2023-Feb. 2025

Fixed-wing UAVs formation flight under variant wind disturbances
- Design the Lyapunov-based formation controller and sliding mode wind observer for fixed-wing UAVs.
- Validate the formation flight performance via SITL simulation, integrated with PX4, Gazebo, and ROS2.

AiSeed Tech Inc.

Robotics AI engineer intern Taipei, Taiwan
Oct. 2021-Aug. 2022

Validate VTOL UAV systems functionality with ROS and Gazebo simulator
- Design a landing algorithm with a changeable landing position for VTOL UAVs.
- Stream inferred video from UAV system to website or ground station through Gstreamer.

Robots and Medical Mechatronics Laboratory (RMML)

Undergraduate researcher Taipei, Taiwan
Sept. 2019-Sept. 2021

Develop a platform for remote control robots for oral and nasal cavity specimen collection
- Build an autonomous specimen collection robot with remote center motion (RCM) mechanism.
- Win sponsorship from the Ministry of Science and Technology (MOST) for 800000 NTD dollars.

SELECTED PROJECTS

RL Final Project – Q-Drive

Team Leader Taipei, Taiwan
Oct. 2024-Dec. 2024

Use PPO to train a quadruped to reach a desired position with tripod gait
- Leverage curriculum learning and hierarchical RL techniques to utilize both front legs of quadrupeds.
- Effectively divide work to team member and organize the weekly meeting to sync up the project progress.
- Win the first 10th place out of 25 groups in the final presentation competition.

3DCV Final Project – AR Vision

Develop a system resembling the AR device and implement a board game. Taipei, Taiwan
Oct. 2023-Dec. 2023
- Transform game image according to gesture utilizing homography and speed-up backward warping.

Azalea Festival Project

Build an autonomous sensing and catching apple car system Taipei, Taiwan
Feb. 2020-Mar. 2020
- Grab apples with a 4R manipulator automatically by obtaining apples' 3-D coordinates.
- Train a model to recognize green and red apples with tiny-yolov3.

PUBLICATION

Lyapunov-Based Formation Controller Design for Fixed-Wing UAVs under Variant Wind Fields
- Wu and Lian, International Conference on Advanced Intelligent Mechatronics (AIM2025)