Ching-Hsiang Wu

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EDUCATION

National Taiwan University Taipei, Taiwan
Master of Science, Automatic Control in Electrical Engineering Feb. 2025(expected)

- **Overall GPA: 4.30/4.30, Rank: 1/97**
- Relevant Courses: Optimal Control(**A+**), System Identification(**A+**), 3D Computer Vision with Deep Learning Applications(In progress)

National Taiwan University Taipei, Taiwan
Bachelor of Science, Biomechatronics Engineering Feb. 2022

- **Overall GPA: 3.39/4.30, Rank: 18/54**
- Relevant Courses: Dynamics and Control of Robots(**A**) Automatic Control (**A**), Digital Control Systems(**A**), Adaptive Control Systems(**A**), Neuro-control Systems(**A**), Digital Image Processing(**A-**)

SKILLS

Programming

- WebDev Languages, Python (Tensorflow2, OpenCV, NumPy, Matplotlib), C/C++, Qt, MATLAB.

Software

- SolidWorks, Simulink, **GAZEBO, Rviz,** Qt designer, QGroundControl, **ROS noetic.**

System & Controller

- Ubuntu18/20, Raspberry pi 4, Arduino, Nvidia TX2, Nvidia Xavier, Pixhawk series, PX4.

Hardware

- Soldering, 3D printing.

RESEARCH EXPERIENCE

Networked Control System Laboratory(NCSLab) Taipei, Taiwan
Graduate student Feb. 20 23-Feb. 2025(expected)
Fixed-wing close formation control under strong wind environment(force 7-9) for coastal defense

- Fixed-wing UAV modeling and control.
- Close formation controller design.
- Path following controller design.

Aiseed tech Inc. Taipei, Taiwan
Robotics AI engineer intern Oct. 2021-Aug. 2022
Building UAV systems

- Connecting a variety of sensors, such as intel realsense d435i, T265, webcam with raspberry pi4
- Validating the automatic tracking algorithm with Gazebo.
- Studying the obstacle avoidance and slam techniques to be applied to UAV system.
- Precision landing function enabled with distance sensor and irlock beacon

Object detection and video streaming

- Streaming inferred video from UAV system to website or ground station through Gstreamer.

Robots and Medical Mechatronics Laboratory (RMML) Taipei, Taiwan
Undergraduate researcher Sept. 2019-Sept. 2021
Development of a platform for remote control robots for oral and nasal cavity specimen collection

- Objective: Building a automatic specimen collection robot with remote center motion(RCM) technique for the sake of higher security during the swabbing process.
- Designed the RCM linkage mechanism
- **Won sponsorship from the Ministry of Science and Technology (MOST)**

Participating in 2019 Bio-mechatronics Field Robot Competition

- Using open source tiny-yolov3 repository to train our model. Aiming at grabbing the apples with a 4-axis manipulator automatically by obtaining apples' 3-D coordinates.

SELECTED PROJECTS

AR Vision: Immersive Entertainment through Virtual Devices

Course : 3D Computer Vision with Deep Learning Applications
Developing a system resembling the Apple Vision Pro, we use a cellphone to simulate AR glasses and a computer to show what the user sees. In addition to presenting the real scene, the computer will also show the game board. The game board is fixed in a virtual location, so its position on the screen varies as the player moves. We implement the Minesweeper as the game board in our project. All actions can be performed through gestures.

Converting Notes to Solmizations on the Music Sheet

Course : Principles and Applications of Digital Image Processing
Inspired by a powerful sheet music recognition app - notation scanner. In order to help people who aren't good at fast reading sheet music, this article describes the implementation details of the OMR(optical musical recognition) technique, which can be applied to converting notes on the sheet music to solmization. Additionally, a user interface also is designed for conveniently converting.

Automatic Specimen-collecting Robot with RCM Mechanism

Side Project
This is an extended project from RMMl lab. I intend to build a fully automatic specimen-collecting robot and try to spawn this robot in a virtual world with the Gazebo simulator. It is a proof-of-concept project. By clicking on the screen, the tip of the cotton rod will arrive at where you clicked.

HONORS AND ACHIEVEMENTS

2020 Taoyuan ROS SUMMER SCHOOL

Integrating NeronBot provided by the ADLINK with ROS/ROS2 and the other self-defined algorithm to achieve the assigned mission automatically.

- Advanced group second runner-up

LEADERSHIP EXPERIENCE

2020 Country Youth Life Study Club

Taipei, Taiwan
Leader of activities department
Sept. 2020-Feb. 2021
Conducting a summer/winter camp in the rural junior high school for a week. The responsibility of activities department is to hold an evening party and bring the laughter and tears to the children.

- Effectively assigning work to every member of activity department.
- Good time management to ensure each work will be in place in time.

2020 Azalea Festival Project

Taipei, Taiwan
Team leader
Feb. 2020-Mar. 2020
Building a truck that can identify green and red apples and pick them into the basket automatically. This truck is equipped with a camera - intel realsense d435 and a robot manipulator in order to draw everyone's attention in the 2019 Azalea Festival.

- Led the team to build an **Automatic sensing and catching apple truck system**
- In charge of image recognition and the transportation between the Arduino and the laptop
- Filmed a recruit video to promote Biomechatronics Engineering Department