

Tsung-Wun Wang (王琮文)

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Education

National Taiwan University, Taipei, Taiwan

Mar. 2021 – Aug. 2023

Master of Science in Mechanical Engineering (Overall GPA: 4.0/4.3)

- Thesis Title: Development of 3D Reconstruction and Navigation for Mobile Robots
- Relevant Coursework: Advanced Computer Vision, 3D Computer Vision with Deep Learning Applications, Operating Systems, Adaptive Signal Processing, System Identification

National Taiwan University, Taipei, Taiwan

Sep. 2016 – Jun. 2020

Bachelor of Science in Mechanical Engineering (Overall GPA: 3.7/4.3)

- Relevant Coursework: Robot Vision, Introduction to Robotics, Machine Learning

Professional Experience

Aeroprobing Inc., Taipei, Taiwan

Jun. 2021 – Aug. 2022

Firmware Engineering Intern

- Worked on FreeRTOS to synchronize multiple tasks on the drones.
- Managed sensor modules using SPI/I2C/UART protocols.
- Applied the extended Kalman filter to estimate orientation, altitude, and position.
- Controlled and fine-tuned drones based on PID control in cascade loops.

Symbio, Inc., Taoyuan, Taiwan

Jul. 2018 – Aug. 2018

Mechanical Engineering Intern

- Created innovative tools to boost coating efficiency and increase the product quality.
- Worked in a team of eight technicians to maintain the manufacturing process.

Course Projects

Real-time Pipeline for 3D Mesh Reconstruction from RGB-D Data

Spring 2023

- Improved camera pose estimation accuracy with bilateral filtering.
- Implemented GPU acceleration for real-time performance.
- Addressed challenges in large-scale environment reconstruction.

Sign-Agnostic Dynamic SLAM

Fall 2022

- Optimized the original NICE-SLAM by applying Sign-Agnostic optimization.
- Implemented Mask-RCNN to remove dynamic obstacles in our SLAM structure.
- Conducted experiments with a handheld RealSense camera to validate our method.

MIMO System Identification of A Quadcopter

Spring 2022

- Implemented MIMO system identification on the drone and compared different models.
- Designed a robust controller and evaluated its performance.

Publications

- Tsung-Wun Wang, Han-Pang Huang, Chiou-Shann Fuh, "Improved Real-Time Dense ORB SLAM with GPU Implementation" in Proc. of the 36th IPPR Conference on Computer Vision, Graphics, and Image Processing, Kinmen, Taiwan, Aug. 2023.
- Tsung-Wun Wang, Po-Yu Lin, Tian-Ju Wu, Pei-Yuan Huang, Cheng-Chi Lee, Hsin-Lin Chen, Feng-Li Lian, "Robotic Arm with A Parallel Gripper applying Mask R-CNN for Garbage Classification," (Best Student Paper Award) in Proc. of the 16th International Conference on Automation Technology, Taipei, Taiwan, Dec. 2019.

Skills & Interests

- **Programming Language:** C/C++, C#, Python, Matlab, Shell Scripting, HTML/CSS, LaTeX
- **Programming Platform:** Linux, VS Code, ROS, CUDA, STM32 CubeIDE, FreeRTOS, Arduino, Nachos
- **Software:** AutoCAD, Solidworks, Inventor, PTC Creo (Pro/E), FreeCAD, LabVIEW, Simulink
- **Languages:** Mandarin (Native), English (Fluent), Spanish (Conversational)