

Tsung-Wun Wang

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Education

National Taiwan University, Taipei, Taiwan

Master of Science in Mechanical Engineering (Overall GPA: 4.0/4.3) Mar. 2021 – Aug. 2023

- 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

Bachelor of Science in Mechanical Engineering (Overall GPA: 3.7/4.3) Sep. 2016 – Jun. 2020

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

Professional Experience

Vecow Co., Ltd., Taipei, Taiwan

Embedded Systems Engineer Aug. 2024 – Present

- Designed and configured MIPI CSI-2 interfaces in Vivado to support multiple cameras.
- Integrated GPS and IMU sensor fusion algorithms into the PetaLinux for enhanced navigation capabilities.
- Developed meta-ros applications in PetaLinux to ensure integration of hardware and software components.

Software Engineer Oct. 2023 – Aug. 2024

- Synchronized and visualized point clouds from LiDARs and cameras using the PCL library.
- Fine-tuned PTP and gPTP protocols for precise GPS time synchronization system-wide.
- Developed a sensor fusion algorithm integrating IMU and GPS for AMR navigation.

Aeroprobing Inc., Taipei, Taiwan

Firmware Engineering Intern Jun. 2021 – Aug. 2022

- Implemented FreeRTOS to synchronize multiple tasks in drone control systems.
- Managed sensor modules using SPI, I2C, and UART protocols.
- Applied extended Kalman filter for sensor fusion, estimating drone orientation, altitude, and position.
- Designed and fine-tuned PID control loops for precise flight control.

National Taiwan University, Taipei, Taiwan

Teaching Assistant (Linear Control Systems) Sept. 2021 – Jan. 2022

- Assisted students with understanding and solving complex control system problems
- Graded assignments, quizzes, and exams, ensuring fair assessment of students' comprehension.

Publications

- Tsung-Wun Wang, Han-Pang Huang, and Yu-Lin Zhao, "Search-based Path Replanning for Autonomous Navigation and Obstacle Avoidance," Best Student Paper Award, in *Proc. of the 21th International Conference on Automation Technology*, Taiwan, Nov. 2024.
- Tsung-Wun Wang, Han-Pang Huang, and Yu-Lin Zhao, "Vision-based Autonomous Robot Navigation in 3D Dynamic Environments," Best Paper Award, in *Proc. of the 41st National Conference on Mechanical Engineering of CSME*, Kaohsiung, Taiwan, Nov. 2024.
- 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 & Certificates

- **Programming:** C/C++, Python, VHDL, HTML/CSS, LaTeX
- **Embedded Systems Tools:** Petalinux, Vitis, Vivado, FreeRTOS, Git
- **Design & Simulation:** Matlab (Simulink), AutoCAD, Solidworks, PTC Creo
- **Hardware Platforms:** STM32, Arduino, LabVIEW
- **Certification:** Robotics Engineer (Taiwan Automation Intelligence and Robotics Association, No. 2017-3-0034)
- **Coursera Courses:** VLSI CAD, FPGA Computing Systems, Computer & Peripheral Hardware