Yu-Chuan Liao

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Education

The University of Manchester — Manchester, United Kingdom
Master of Science in Robotics — *Sep. 2024 – Present*
- Computer Vision, Robotic Systems, Robotic Manipulators, Autonomous Mobile Robots, Machine Learning

Karlsruhe University of Applied Science — Karlsruhe, Germany
Exchange student — *Mar. 2023 – Aug. 2023*

National Taipei University of Technology — Taipei, Taiwan
Bachelor of Science in Mechanical Engineering (81.1%) — *Sep.2019 – June 2023*
- Mechanical Design, Control Systems, Dynamics, Artificial Intelligence, Linear Algebra, Data Structure

Projects

MSc Dissertation | *NVIDIA Omniverse, Python* — June 2025 – Aug. 2025
Methodology for High-Fidelity Digital World Creation for Robotic Simulation
Developing and Validating a high-fidelity digital world in NVIDIA Omniverse, providing a physically accurate simulation platform
- Processed large-scale point cloud data, reconstructing them into simulation-ready 3D environments with a core focus on realistic material properties and physics-based interactions.
- Validated the environment's fidelity by deploying robotic models in NVIDIA Isaac Sim to quantitatively analyze simulation data, including collision events and path traversal, confirming its utility as an advanced robotics validation platform.

LeoRover | *Python, ROS2, Raspberry Pi,* — Sep 2024 – April 2025
Develop a robot which can autonomously search and retrieve colored objects from the environment and place them in matching storage bins in a team project.
- Designed a custom sensor platform using CAD; integrated LiDAR, depth camera, manipulator, and NUC; validated structural stability via load analysis.
- Implemented Python-based color detection and depth estimation using a depth camera for 3D object localization.
- Integrated SLAM, object recognition, and grasping in a ROS-based robotic system to enable autonomous operation.

Automatic warehouse robot | *Arduino,* — Feb 2022 – Nov 2022
Developed a vision-guided robotic system that locates and grasps user-specified objects based on camera input and image-based control logic.
- Simulated forward kinematics in MATLAB with joint angle constraints to model collision-free robotic motion.

Experience

Tong Yang Industry Co. Ltd. — Tainan City, Taiwan
Mold Development Engineer Intern — *July 2021 – Aug. 2021*
- Conducted reverse engineering and designed an injection mold using CAD.
- Employed CAD and CAE tools for design refinement and performance analysis.
- Fabricated and validated the mold through functional and dimensional testing.

National Taipei University of Technology — Taipei, Taiwan
Head of Equipment Division, Mechanical Engineering Student Association — *Sep 2020 – Jun 2021*
- Managed venue and equipment logistics for student events, including coordination of booking and rental process.
- Organized an camping event with over 50 participants, overseeing scheduling, transportation, and safety protocols.
- Prepared risk assessments and official event proposals to ensure compliance with university regulations.

Technical Skills

Languages: Python, C, C++, Matlab, Bash
Frameworks: ROS2, Gazebo, RViz, Nav2, URDF, OpenCV, TensorFlow,
Operation system: Linux, MacOS, Windows
Hardware: Raspberry Pi, Arduino, Intel RealSense Camera, LiDAR
Mechanical Design: Fusion 360, SolidWorks, AutoCAD