Wilson **Wei-Lin Liao**

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Education

University of California, San Diego (UCSD) — *La Jolla, CA*

M.S. in Electrical and Computer Engineering (Robotics track) — *Sep. 2022 – Dec. 2023 (exp.)*

- Selected Courses: Sensing & Estimation in Robotics, Advanced Data Structures, Intro to Visual Learning, Planning & Learning in Robotics

National Taiwan University (NTU) — *Taipei, Taiwan*

B.S in Mechanical Engineering — *Sep. 2017 – Jan. 2022*

- GPA: **4.10**/4.30 (CS-Related), **4.06**/4.30 (Last 60)
- Selected Courses: Algorithm, Data Structure, Operating Systems, Machine Learning, Deep Learning for Computer Vision, Linear Algebra, Advanced Statistics, Automatic Control, Digital Control System

Technical Skills

Programming Languages	C/C++, Python, Golang, MATLAB, SQL, Shell Scripting
Machine Learning & Deep Learning	PyTorch, OpenCV, Tensorflow, Scikit-learn, Computer Vision, Natural Language Processing
Robotics	Point Cloud Library (PCL), ROS, SLAM, LiDAR, PID control
Others	Object-oriented programming, Git, Docker, Linux, Arduino

Experience

Perception Software Engineer Intern (C++, ROS, PCL, Docker) — *Taipei, Taiwan*

FARobot Inc. — *June 2022 – Aug. 2022*

- Developed a **LiDAR-based** reflector detection system with **RANSAC** and **ICP** algorithm for **autonomous mobile robots**
- Achieved **tolerance under 5mm** for docking pose with **40 fps** using **multi-threading**
- Reduced **50%** setup time by replacing the parameter-tuning process with reflector position adjustment

Deep Learning Research Assistant (Python, PyTorch) — *Taipei, Taiwan*

Chinese Knowledge and Information Processing Lab, Academia Sinica — *Feb. 2022 – May. 2022*

- Built a novel data augmentation framework for **Visual Question Answering** task with **ResNet** and **Transformer**
- Increased **150%** unique Question-Answer pairs for training
- Expanded [1] research by caching knowledge embedding to **reduce 33% of memory consumption** without performance drop

Deep Learning Research Assistant Intern (Python, PyTorch) — *Taipei, Taiwan*

Chinese Knowledge and Information Processing Lab, Academia Sinica — *July 2021 – Jan. 2022*

- Increased the accuracy by **1.5% on Question Answering** task by querying external information from knowledge base
- Overcame the limitation of input length in **BERT** to allow more context information for output embedding
- Submitted a **first-authored** paper to NAACL2022 [link] [pdf] [1]

Deep Learning Undergraduate Researcher (Python, Tensorflow) — *Taipei, Taiwan*

Multimedia Information Retrieval Lab, NTU — *Mar. 2021 – June 2021*

- Increased the AUC score by **10%** by designing a **Conditional AutoEncoder** for **unsupervised anomalous sound detection**
- Submitted a **first authored** technical report to DCASE2021 workshop [pdf]

Robotics Undergraduate Researcher (C++, Python) — *Taipei, Taiwan*

Robotics Lab, NTU — *July 2020 – Sep. 2020*

- Developed a **autonomous mobile robot** to automatically sterilize environment for hospitals during the pandemic
- Integrated **sensor fusion**, hardware designs and power supply of the robot system

Projects

Visual-Inertial SLAM (Python) — *Mar. 2023*

- Implemented **Visual-Inertial SLAM** using **Extended Kalman filter (EKF)** with IMU and visual landmark data

Particle Filter SLAM (Python) — *Feb. 2023*

- Implemented **Particle Filter** and **2D occupancy grid map** for robot **SLAM** problem with encoder, IMU and LiDAR data

ICCV Workshop Long-Tailed Image Classification (Python, PyTorch) — *Jan. 2022*

- Improved the accuracy of rare classes by **65%** by applying Test-Time Aggregating Diverse Experts architecture (TADE)
- Conducted experiments on using **Vision Transformer** and **Efficient Net** backbones and **focal loss** with TADE

Semantic Segmentation for Satellite Images (Python, PyTorch) — *Nov. 2021*

- Improved the mean Intersection over Union (mIoU) by **5%** with **VGG16-FCN8s** model for **semantic segmentation** task