Wei-Lin (Wilson) Liao

+1(858) 531-0128 | willson310116@gmail.com | personal website | weilinliao

Education

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

M.S. in Electrical and Computer Engineering (Robotics track) — *Sep. 2022 – Mar. 2024 (exp.)*

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

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

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

- GPA: **4.10**/4.30 (CS-Related)
- Selected Courses: Algorithm, Data Structure, Operating Systems, Machine Learning, Deep Learning for Computer Vision, Advanced Statistics

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

ARVR Algorithm Intern (C++, Python, PCL, OpenCV) — *Austin, TX*

Futurewei Technologies, Inc. — *June 2023 – Present*

- Developed a real-time **3D body tracking** system with generalized skeleton format and multi-user support for mixed reality applications
- Integrated multiple **depth cameras** and performed sensor fusion with **3D point cloud alignment** to solve body tracking occlusion
- Implemented a **shared memory** module for data transmission between separate processes

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**-based 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

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 with **BERT** by querying external information from knowledge base
- Reduced **33%** of memory consumption without performance drop by caching knowledge 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]

Selected Projects

Search-based and Sampling-based Motion planning (Python) — *May 2023*

- Implemented **weighted A*** searching-based planning algorithm and **collision detection** in 3D scenes
- Compared performance between weighted A* and **RRT** sampling-based planning algorithms

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%** via Test-Time Aggregating Diverse Experts (TADE) with **Vision Transformer** backbone

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