Zi-Yan Liu

Pennsylvania, Philadelphia

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Education

University of Pennsylvania (UPENN) — Pennsylvania, Philadelphia
Graduate Degree Program of Robotics — Sep. 2023 - Jun. 2025

- Related Courses: Machine Perception in Geometry, Control and Optimization with Applications in Robotics, Design of Mechatronic Systems

National Tsing Hua University (NTHU) — Hsinchu, Taiwan
Bachelor of Science, Interdisciplinary Program of Engineering(IPE) — Sep. 2016 - Jan. 2021

- Double Specialities: Power Mechanical Engineering , Physics

Work Experience

Tron Future Tech Inc. — Hsinchu, Taiwan
Software Engineer Intern — May 2023 - Aug. 2023

- Project: **Enhancing Drone Detection**
  - Incorporated **optical flow** data into raw sensor data to avoid the background interference for improvement
  - Implemented an efficient tracking system using **OpenCV and YOLO v7** to optimize computational resources

Artificial Intelligence and Multimedia Laboratory. (NYCU) — Hsinchu, Taiwan
Research Assistant — Mar. 2022 - Jan. 2023

- Project: **Assistive Integration System for Autonomous Vehicles**
  - Integrated **vision, Lidar**, and sound data to predict pedestrians' movement and improve safety
  - Devoloped real-time on-board data pipelines using Robot Operating System **(ROS)**
- Project: **Improved Trajectory Prediction through Self-Supervised Mechanisms and Visual Prompt Tuning**
  - Leveraged **self-supervised learning** techniques to refine trajectory prediction results
  - Introduced learnable **visual prompts** to enhance scene understanding

Assistive Robotics Group. (NYCU) — Hsinchu, Taiwan
Research Assistant — Mar. 2021 - Dec. 2021

- Project: **Assistive Navigation System for Visual Impaired**
  - Reformed **indoor robots** with add-on equipment to provide semantic sound and haptic feedback in missions
  - Combined **reinforcement learning** and ultra-wided bandwidth **(UWB)** localization system for crowded environment
- Project: **Heterogeneous Unmanned Ground Vehicle and Blimp Robot Team for DARPA Subterranean Challenge**
  - Utilized **SLAM**, artifact classification, **reinforcement learning** to approach autonomous search and rescue system
  - Installed ultra-wided bandwidth **(UWB)** module to localize all vehicles to perform localizability-aware SLAM
- Published papers to **Field Robotics 2021** and **Frontier of Robotics and AI**

Industrial Technology Research Institute. (ITRI) — Hsinchu, Taiwan
Software Engineer Intern — Jul. 2020 - Dec. 2020

- Built fully automated pipelines to control unmanned ground vehicles for power plant cruising
- Integrated required hardware and communication interfaces

Publications

- **Assistive Navigation using Deep Reinforcement Learning Guiding Robot with UWB/Voice Beacons and Semantic Feedbacks for Blind and Visually Impaired People** - (Second Author) In Frontier in Robotics and AI. 2021
- **A Heterogeneous Unmanned Ground Vehicle and Blimp Robot Team for Search and Rescue using Data-driven Autonomy and Communication-aware Navigation** - (Fourth Author) In Field Robotics - Special Issue: Advancements and lessons learned during Phase I & II of the DARPA Subterranean Challenge. 2021

Skills

- **Programming Languages:** C, C++, Python, MATLAB, Lua
- **Deep Learning Framework:** TensorFlow, PyTorch
- **Software, Middleware, and Libraries:** Git, ROS, Docker, OpenCV, Open3D, PCL, CARLA