

YI-CHENG(JERRY) LIU

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Education

University of Michigan, Ann Arbor

Sept 22 - Apr 24

Master of Science in Electrical and Computer Engineering (GPA: 4.0/4.0)

Ann Arbor, MI

- **Related courses:** Robotic Systems Laboratory, Introduction to Algorithmic Robotics, Computer Vision, Mobile Robots(SLAM), Embedded Control Laboratory, Computer Programming for Scientists and Engineers, Math for Robotics

National Taipei University of Technology

Sept 17 - Jun 21

Bachelor of Science in Vehicle Engineering (GPA: 3.71/4.0, Last 60 GPA: 3.93/4.0)

Taipei, Taiwan

- **Related courses:** Automatic Control, Vehicle Control Laboratory, Intelligent Vehicle Dynamic and Control, Introduction to Robotics, Python Program Design and Application

Technical Skills

Programming Languages: C/C++, Python, MATLAB (Simulink, Stateflow), HTML/CSS

Application and Tools: OpenCV, Pytorch, Numpy, ROS, Git

Coursera Course: Supervised Machine Learning, Computer Vision Basics, DevOps CI/CD with Git Jenkins and Kubernetes, State Estimation and Localization for Self-Driving Cars

Projects

Adaptive Cruise Control Simulation | C, MATLAB, Simulink, CAN bus

Jan 23 - Apr 23

- Developed an adaptive cruise control and auto-steering features using Simulink model with **C language** autocode generation, incorporating a vehicle model
- Designed position, velocity and manual mode control on a virtual car in an unreal engine environment by implementing features with GPIO, ADC, haptic wheel and interrupt, on an **S32K144 ARM Cortex-M4** core
- Employed **CAN bus** protocol to simulate the radar data acquisition process, exchanging position and velocity data

SLAM-based Driver Assistance System Applications | C++, Simulink, CAN bus, Autoware, ROS

Sept 20 - Jun 21

- Calibrated Velodyne LiDAR, VLP-16, and integrated camera by Autoware object detection package for Emergency Brake Assist (EBA)
- Implemented integration of **model-based control** subsystems (wheel-hub motors, Electric Power Steering, ibooster) with the TI F28069M microcontroller using **CAN bus** protocol
- Created 3D campus-scale pointcloud maps using Autoware, achieved localization and recorded waypoints with the maps
- Developed custom CAN packets to transmit control commands to the microprocessor through the CAN bus, resulting in the activation of actuators

Object SLAM with dual quadrics | C++, GTSAM, OpenCV [Github](#)

Jan 23 - Apr 23

- Developed a monocular **SLAM** system that utilizes ellipsoids to model objects and generate 3d map via **GTSAM**
- Optimized ellipsoids orientation based on plane supporting, sementic scale, and symmetry constraints
- Improved system stability by developing an associator that uses **IoU** in different frames to accurately model the same objects, ruling out **90%** of loss of frame

Player tracking and bird-eye diagram trajectory | Python, Pytorch, YOLO, OpenCV [Github](#)

Feb 23 - Apr 23

- Trained YOLOv5 and pre-trained **Fast R-CNN model** with self-labeled dataset to recognize players, teams, and referees from raw basketball videos
- Retrieve keypoint positions in the image space by an **Restnet-18** encoder-decoder network, and employed a **RANSAC algorithm** to estimate the optimal homography between in a 2D position
- Recognized players on different teams and referees on the bird-eye diagram and recorded their trajectory by **homography** transform

Professional Experience

Cheng Feng Service Center, Peugeot

Jun 19 - Aug 19

Assistant Automotive Technician

Taichung, Taiwan

- Conducted mechanical and structural inspections and maintenance; examined, repaired and replaced auto parts
- Diagnosed and repaired electrical, electronic and cooling systems
- Offered emergency roadside assistance services