Jing–An Tzeng

734-882-5333 | robintzg@umich.edu | https://robintzeng.github.io/

EDUCATION

University of Michigan — **Ann Arbor, MI**
Master of Science in Electrical and Computer Engineering — Apr 2021
Concentration: Robotics — **GPA**: 4.0/4.0
Coursework: Self-Driving Cars: Perception and Control, Computational Data Science and Machine Learning (F19)
Mobile Robotics, Foundations of Computer Vision, Embedded Control (W20)

National Tsing Hua University (NTHU) — **Hsinchu, Taiwan**
Bachelor of Science in Power Mechanical Engineering — Jun 2018
Concentration: Control System — **GPA:** 3.92/4.3

PROFESSIONAL EXPERIENCE

ASML — **San Diego, CA**
Droplet Generation Control and Automation System Intern, Control Team — May 2020 – Aug 2020

- Designed an object detection pipeline using OpenCV, Tkinter and Scikit-learn to detect the tin droplets and satellites, including preprocessing, labeling, feature extraction and classification from scratch.
- Detected the interest objects with maximally stable extremal regions (MSER) and eliminated the overlapped bounding boxes with Non-Maximum Suppression (NMS) and achieved 99% accuracy.
- Evaluated the classifiers' performance using k-fold cross validation, confusion matrix, learning curve and validation curve to prevent overfitting.

PROJECT EXPERIENCE

Mobile Robotics - Visual Inertia Navigation — **Ann Arbor, MI**
Team Leader — Mar 2020 – Apr 2020

- Improved a Muti-State Constraint Kalman filter-based visual inertial navigation framework (Openvins) with learning-based interest point extractor – SuperPoint in Pytorch using C++.
- Evaluated the performance on the EuRoC MAV dataset with ROS and ameliorated the performance for every tasks.

Computer Vision - Depth Completion — **Ann Arbor, MI**
Team Member — Mar 2020 – Apr 2020

- Completed dense depth data from a color image and sparse LiDAR data in KITTI depth completion benchmark.
- Developed learning architecture included a two pathway system with the U-Net like low-resolution feature extractor, and utilized attention mechanism to propose the final prediction in Pytorch.

Self-Driving Car - Object Detection — **Ann Arbor, MI**
Perception Team Leader — Nov 2019 – Dec 2019

- Placed 2^{nd} overall in class and implemented and trained YOLOv3 on the given dataset in Python with Keras.
- Developed a layer to discriminate the distance of the objects with the point cloud.

Eurobot 2018 Contest - Autonomous Robot — **Taiwan/France**
Software Team Leader — Sep 2017 – Jun 2018

- Placed 24th overall in world counted.
- Prototyped positioning system model with MATLAB for integration test, utilized microcontrollers and ultra-wideband (UWB) chips to trace the robots accurately and practiced the whole system in C++ in Linux.
- Implemented Kalman filter and trilateration algorithm to enhance measuring accuracy and stability, increasing 30% accuracy which is within 5 cm radius with high repeatability.

Powered Exoskeleton for Motion Recording — **Hsinchu, Taiwan**
Sensing and Communication Team Leader — May 2017 – Dec 2017

- Placed 2^{nd} and "Most Popular" awards from 50 teams in Senior Capstone Project Competition.
- Developed a sensing exoskeleton suit by integrating 4 microcontrollers, 6 encoders and 4 inertial sensors to detect and record the user's movements, i.e. hand gestures.
- Used SPI, I^2C, UART for fetching the data to the microcontrollers and estimate the user's movement by adopting complementary filter to fuse the gyroscope and accelerometer data.
- Built a Bluetooth communication system with cyclic redundancy check (CRCs) to improve its consistency.

TECHNICAL SKILLS

Programming Languages: C++, Python, MATLAB, Simulink
Toolkit/Frameworks/Platforms: ROS, Arduino, PyTorch, OpenCV, scikit-learn, Linux(Ubuntu), Git