Jing–An Tzeng

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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)
Advanced Computer Vision, Applied Parallel Programming with GPUs, Deep Learning for Computer Vision (F20)

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

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