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
Coursework: Self-Driving Cars: Perception and Control, Computational Data Science and Machine Learning (F19)
Mobile Robotics, Foundations of Computer Vision, Embedded Control (W20)
- **Average GPA**: 4.0/4.0

National Tsing Hua University (NTHU) **Hsinchu, Taiwan**
Bachelor of Science in Power Mechanical Engineering Jun 2018
Concentration: Control System
- **Average GPA**: 3.92/4.3; **Ranking**: 5/97

PROFESSIONAL EXPERIENCE

ASML **San Diego, CA**
Droplet Generation Control and Automation System Intern, Control Team May 2020 – Aug 2020
- Designed an object detection pipeline included 4 steps: preprocessing, labeling, feature extraction and classification from scratch to detect the tin droplets and satellites.
- Detected the interested objects with maximally stable extremal regions (MSER) and eliminated the overlapped bounding boxes with Non-Maximum Suppression (NMS).
- Evaluated the performance of the classifiers with k-fold cross validation, confusion matrix, learning curve and validation curve.

PROJECT EXPERIENCE

Mobile Robotics - Visual Inertia Navigation **Ann Arbor, MI**
Team Leader Mar 2020 – Apr 2020
- Modified an open source visual inertial navigation framework (Openvins) with learning based feature extractor – SuperPoint in Pytorch in C++.
- Evaluated the performance on the EuRoC MAV dataset with ROS and improve 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 path way system included 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 24^{th} 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.

Mobile Robot **Hsinchu, Taiwan**
Control Team Leader Sep 2017 – Jan 2018
- Develop a discrete-time PID controller and implemented it on Altera DE0-Nano by programming in Verilog.
- Handled input from rotary encoders and output with PWM signals to control the rotational speed.

Wafer Gripper **Hsinchu, Taiwan**
Software Team Member Sep 2017 – Jan 2018
- Designed a G-Code Interpreter to read the NC (numerical control) code and execute them on 3-axis wafer gripper.
- Built a human - computer interface and stimulated the wafer gripper's motion by using Windows Forms.
- Implemented trapezoidal velocity profile and interpolation to control the stepper motors smoothly.

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 consisting of 4 microcontrollers, 6 encoders and 4 inertial sensors for detecting and recording the user's movements, i.e. hand gestures.
- Used SPI, $\mathrm{I}^2\mathrm{C}$, UART for fetching the data to the microcontrollers and fused the gyroscope and accelerometer data by compensation filter.
- Built a Bluetooth communication system with cyclic redundancy check (CRCs) to improve its consistency.

TECHNICAL SKILLS
- Programming Languages: C++, C, Python, MATLAB
- Toolkit/Frameworks/Platforms: ROS (Robot Operating System), Arduino, PyTorch, OpenCV, scikit-learn, Pandas, Linux, Windows

LEADERSHIP
Enterprise Talent Development Program Vice Group Leader
Mountaineering Club in NTHU Intern Tour Guide