

Jing-An Tzeng

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SUMMARY

MS student in Electrical and Computer Engineering. 2020 summer interned at ASML with experience in computer vision, machine learning, image processing and SLAM. Strong software skills in C++ and Python.

EDUCATION

University of Michigan

Ann Arbor, MI

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

Apr 2021

- Coursework: Self-Driving Cars: Perception and Control, Computational Data Science and Machine Learning, Mobile Robotics, Foundations of Computer Vision, Advanced Computer Vision, Applied Parallel Programming with GPUs.

National Tsing Hua University (NTHU)

Hsinchu, Taiwan

Bachelor of Science in Power Mechanical Engineering, GPA: 3.92/4.3, Rank: 5/97

Jun 2018

- Coursework: Data Structures and Algorithms, Linear Algebra

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

PROJECT EXPERIENCE

Advanced Computer Vision – Improvements on Object Detection (Faster R-CNN)

Ann Arbor, MI

Software Team Leader

Sep 2020 – Dec 2020

- Trained and evaluated the Faster R-CNN on PASCAL VOC 2007 with PyTorch.
- Introduced efficient channel attention and cross stage network to ResNet-50 backbone and increased 5 mAP.
- Decoupled the classification head and localization head and improved the mAP by 1.

Individual Study – Benchmark for Video Inpainting

Ann Arbor, MI

Team Member

Sep 2020 – Dec 2020

- Designed algorithms to classify the degree of attributes — camera motion, foreground motion and displacement — which affect the video inpainting model performance on DAVIS dataset.
- Evaluated the performance of the algorithm by Precision – Recall curve and ROC curve.

Mobile Robotics – Visual Inertia Navigation (VI-SLAM)

Ann Arbor, MI

Team Leader

Mar 2020 – Apr 2020

- Improved a Muti-State Constraint Kalman filter-based visual inertial navigation framework (Opencvins) with learning-based interest point extractor – SuperPoint in Pytorch by 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 two-pathway learning architecture with U-Net like low-resolution feature extractor and utilized attention mechanism to propose the final prediction in Pytorch.

Eurobot 2018 Contest – Autonomous Robot

Taiwan/France

Software Team Leader

Sep 2017 – Jun 2018

- Prototyped positioning system model with MATLAB for integration test, utilized microcontrollers and ultra-wideband (UWB) chips to locate the robots accurately and practiced the whole system with 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.

TECHNICAL SKILLS

Programming Languages: C++, Python, MATLAB, Simulink

Platforms/Toolkit/Frameworks: Linux (Ubuntu), Git, ROS, Arduino, PyTorch, OpenCV, Scikit-learn