

Wen-Yen Chang

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SPOTLIGHT

I have over 7 years of experience in Python and 9 years in C++ for system development, In the industry field, I work 3.5 years for algorithm system develop on edge device and focus on model compression in Qualcomm XR. During this period, I have ownership about quantization feature impacts Qualcomm XR device reduce at least 75% power consumption and 80% latency with NPU. In the academic field, I focus on reduce building AI system cost by data collection effectively, I have published three paper on ECCV, WACV, and CVGIP, specifically I have led a team published CVGIP paper, working on vision task active learning with reinforcement learning technique.

SELECTED EXPERIENCES

XR 3D Reconstruction, Computer Vision System Engineer July 2021 – Nov. 2024
Qualcomm(QSL) inc. Hsinchu, Taiwan

- Research: Model compression, specifically tune on edge device
 1. Model quantization in order to optimize target products' latency/power by low-bits (W4A8, W8A8).
 2. Model architecture selection and operation fusion.
- Applications (The Comparison are FP16 model on NPU)
 1. Monocular Depth Prediction, reduce 82% latency , 78% power and improve 12% accuracy.
 2. Segmentation for Instance and background, reduce 81% latency, 75% power and keep accuracy.

Private (Compulsory) Sep. 2020 – Jan. 2021
302 Brigade, 10th Army Corps, R.O.C Army Taichung, Taiwan

Machine Learning Research Intern May 2020 – Sep. 2020
Kaikutek inc. Taipei, Taiwan

- Research: fast hand-gesture recognition and personalization(few-shot learning).
- Cloud Computing System: Server-less training platform by AWS.

EDUCATION

National Tsing Hua University (NTHU) Hsinchu, Taiwan
M.Sc. in Electrical Engineering, Advisor: Prof. Min Sun, GPA: 4.3/4.3 Feb. 2018 – June 2020

National Chung Cheng University (CCU) Chiayi, Taiwan
B.Sc. in Electrical Engineering, Advisor: Prof. Ching-Chun Huang, GPA: 4.14/4.3 Sep. 2014 – Feb. 2018

THESIS

Enhance data selection efficiency with variational auto-encoder for object detection's active learning
Research directions: **Active Learning, Unsupervised Learning, Object Detection** | Tools: **Python, Pytorch** *Master Thesis*

- It can save 70% labeled cost for achieving a usable model in diverse domains and rare events.
- Uncertainty and diversity information are important for active learning.
- VAE can provide good representation for known the unlabeled data distribution in surveillance cameras.

ParkingLot Services: Car tracking and localization
Research directions: **Object Detection, Sensor Fusion** | Tools: **C++, Android, Tensorflow, Matlab** *Undergraduated Project*

- Getting more reliable tracking results, I use image motion to enhance image-based object detection model.
- Eliminating GPS localization error, I use trajectory information to reduce the white noise by Kalman Filter.
- Checking parking location for finding, I fuse GPS and image localization information by driving behavior matching.

PUBLICATIONS

Shih-Han Chou, Cheng Sun, Wen-Yen Chang, Wan-Ting Hsu, Min Sun, Jianlong Fu, "360-Indoor: Towards Learning Real-World Objects in 360° Indoor Equirectangular Images". In **WACV**, 2020. (With Microsoft Asia)

Wen-Yen Chang, Wen-Huan Chiang, Shao-Hao Lu, Tingfan Wu, Min Sun, "Bias-Aware Heapified Policy for Active Learning". In **CVGIP**, 2019. (With Umbo)

Yu-Ting Chen, Wen-Yen Chang, Hai-Lun Lu, Tingfan Wu, Min Sun, "Leveraging Motion Priors in Videos for Improving Human Segmentation". In **ECCV**, 2018. (With Umbo)

AWARDS AND HONORS

Spring 2020, **Phi Tau Phi Scholastic Honor**: top 1 master student in the electrical engineering department of NTHU.
Fall 2018, **Appier Scholarship**: for outstanding students in their research with top conference papers.
Fall 2017, **The High Distinction Award**: the 1st prizes for undergraduated project of electronic engineering in CCU.
Fall 2017, **The Chair Award**: the most potential product in undergraduated projects of electronic engineering in CCU.
Fall 2014, 2015, 2016, Spring 2014, 2016, **Academic Achievement Award**: top 3 students in a semester in CCU.

ACADEMIC ATTENDANCE

Computer Vision, Graphic and Image Processing (CVGIP), Aug. in Taitung, Taiwan, 2019.
Proceedings of the European Conference on Computer Vision (ECCV), in Munich, Germany, 2018.

RELATED COURSES

Computation photography (A+)
Computer Vision (A+)
Machine Learning (A+)
Neural Networks (A)
Introduction to Image Processing (A+)

FINAL PROJECTS AND SIDE PROJECTS

Computer Vision Application

- **Cinema-graph**: Automatically create Cinema-graph from video, we apply few-shot labeling tool and use computer vision techniques. [\[pdf\]](#), [\[slide\]](#)
- **Home care App.**: A android application to recognize the number on blood-pressure machine. The recognition system need to deal with multiple material display. [\[pdf\]](#)
- **OCR application**: In order to crack the reCAPTCHA, I create a characters detection to automatic buy the ticket.

Robotics Application

- **ORB SLAM**: system build-up (ROS, PCL). [\[video\]](#)
- **Indoor localization**: localization by gyroscope and using QR-code to correct localization error. [\[video\]](#)
- **3D reconstruction**: apply structure from motion algorithm on 3D gastrointestinal tract reconstruction. [\[video\]](#)
- **3D Game**: using OpenGL with shader code to create a world of game. [\[video\]](#)

MCU application

- **8051 Assembly**: LCD game. [\[slide\]](#)
- **Embedding communication system with C**: auto-detect wearable device status, and using Lora to communication for control and alert. [\[video\]](#)
- **Raspberry pi with camera**: upload data automatically for violent detection.
- **Bluetooth communication**: for remote controlling the robot(Arduino).

Market analysis (auction rule): taxi-bidding simulation [\[pdf\]](#)/ [\[video\]](#)

ABILITIES

Programming:

- **Programming language**: C/C++, C#, Java, Python, Matlab, Assembly
- **Deep Learning Frameworks**: Caffe, Tensorflow, Pytorch
- **Web Tools**: html, css, javascript, ruby
- **UI Tools**: MFC, QT

Hardware/Firmware:

- **Without UNIX OS**: 8051, Arduino, Nu-LB-NUC140
- **With UNIX OS**: Raspberry-Pi zero, TX2(ROS)
- **Hardware Describe language**: Verilog

Misc. : OpenCV, OpenGL, Github, Docker, Vim, Linux, LATEX

Language Abilities:

- **Chinese(Tranditonal)**: Native
- **English(Listening/Speaking/Reading/Writing)**: (Advanced/Advanced/Fluent/Fluent)