Wei-Ting 'Lily' Hsu

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Education

M.S. in Graduate Degree Program of Robotics, National Chiao Tung University (NCTU)**,** Taiwan.	2019 ~ present
B.S. in Electrical and Computer Engineering (ECE), National Chiao Tung University (NCTU), Taiwan.	2015 ~ 2019
Class for the Math and Science Gifted students, National Hsinchu Girls' Senior High School (HGSH).	2012 ~2015

Research Interests

Unmanned ground vehicle (UGV), Automatic Control System, Simulation, Robotics Arm, Robotics Vision, Machine Learning, Introduction to Artificial Intelligence (Robotics)

Related Courses

Automatic Control Systems, Robotics, Self-Driving Cars, Mobile Robots, Image Processing, Data Science, Sensing and Intelligent Systems

Skills

Languages: Chinese(native), English(fluent)

Programming: C/C++, C#, Java, Python, Matlab

Middleware and Libraries: Robotic Operating System (ROS), OpenCV, PCL (Point Cloud Library)

Simulation: Gazebo, Unity

Software: SketchUp, SolidWorks, 3D Builder, MeshLab, PhotoShop

Research Projects and Professional Experience

Duckietown – Robotics Education & Demo Experience (2017-2019)

　　I have learnt a lot from Duckietown since I was in third grade, doing the project with professor Nick Wang. Duckiebot is my first robot and it is a self-driving car platform for education, research and promotion. For the skills' part, I have learnt the basic knowledge of self-driving car, ROS(Robot Operating System) and openCV. In

addition, I have been to Sydney to participate RoboCup as a member of exhibitors to promote Duckietown in July, 2019. I gained a lot of valuable experience in these demo events for the students and others who don't have the background knowledge about robotics and self-driving car.

Simulation (Duckietown) (2017-2018)

During the project in grade third, I use Gazebo to build a virtual environment, trying to let the duckiebot finish the driving test by itself. From this project, I learn how to use Gazebo to run my system and making both robot model and the map by SolidWorks and SketchUp.

Virtual Data (Pick-and-Place System) (2018-2019)

In grade forth, I join a team about pick-and-place system in our lab. Our goal is to let the robot arm pick the object and place it to the right shelf with its front side by detecting its brand name. In the team, I am responsible for building the objects' model and generating the virtual datasets. It is important to use virtual data to improve the efficiency of collecting data to train the FCN model. Our paper has been published in 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) and this is our website: https://text-pick-n-place.github.io/TextPNP/.

Synthetic data & fast neural style transfer (FNST) & FCN model (Pick-and-Place System) (2019-2020)

To improve the effectiveness of virtual data on detection, I apply the fast neural style transfer to the virtual dataset in my prior work. Training by FCN model, the result of synthetic dataset is much better than the original virtual dataset's and significantly reduced the number of real dataset we need to use. We only need a small amount to fine-tune.

Pick-and-Place System for Industry & Mask R-CNN model (2020-2021)

In 2020, I lead the team and try to develop our system to apply in factory assembly line to pick the electronic components. We use UR5 robotic arm and use Mask R-CNN model instead of FCN model. Because Mask R-CNN can produces a better semantic segmentation result and provide instance segmentation prediction which is very useful to separate the prediction of the same class of objects.

Teaching Experience

Teaching Assistant, Creative Software Project (Fall 2017)

Teaching Assistant, Human Centric Computing (Fall 2019)

Teaching Assistant, Sensing and Intelligent Systems (Spring 2020)