

Tzu-Kuan 'Brian' Chuang

Phone: +886-9-11302514

Email: fire594594594@gmail.com

Education:

M.S. in Institute of Electrical Control Engineering,
National Chiao Tung University (NCTU), Taiwan. 2014-present

B.S. in Electrical and Computer Engineering (ECE),
National Chiao Tung University (NCTU), Taiwan. 2010-2014

Awards and Funding:

Scholarship of Excellent Graduate Students for International Collaboration Research,
NCTU (國立交通大學優秀博碩士生出國短期研究獎學金) 2016

Research Interest and Related Courses:

Robotics and AI: Robotics (A+), Robotic Vision (A+), Neural Network (A)

Biomedical Imaging, Image Processing (A), Digital Signal Processing (A-),
Introduction of Biomedical Engineering Research (A-), Cognitive Neuro-Engineering
(A+), Colorimetry (B-), Clinical Application of Medical Electronic Devices (A+)

Research Experience:

Assistive Robotics Group, 2016-present, Advisor: Prof. Hsueh-Cheng 'Nick' Wang

Project: Constraint text spotting for robot navigation using deep convolution neural network (CNN).

The project intends to enable a mobile robot to execute high-level tasks such as navigation. The challenges include limited network bandwidth and latency while running CNN on cloud workstation, as well as limited memory running CNN on embedded system. I proposed an on-board solution that runs a truncated deep CNN containing sufficient semantic labels in an environment. Such work first required a full network transplant from a pre-trained model such as VGG-DICTNET, and transfer learning was performed for given desired labels. The trained models were then deployed on a mobile robot, which is capable of reading street names and perform left/right turns in an experiment environment.

Visiting Student, MIT Computer Science and Artificial Intelligence Laboratory (CSAIL), summer, 2016, Advisor: Dr. Liam Paull

Project: Portable motion capturing system in Duckietown

I have deeply involved in Duckietown, an open source platform for autonomy education and research, developed in MIT CSAIL. I was the teaching assistant of the first branch of Duckietown, and developed supplemental materials and tutorials (<http://duckietown.nctu.edu.tw/materials.html>) in Duckietown@NCTU hand-on experiments. I worked with Dr. Liam Paull in MIT on a motion capturing system based on AprilTags and multiple machine integrations in Robot Operation System (ROS) and lightweight communication and marshalling (LCM). Such low-cost system allows accurate position estimations and could be extended in both indoor and outdoor environments.

Neural Engineering and Interface Laboratory, 2014-2015, Advisor: Prof. Charles T. M. Choi

Project: Bladder volume measurement using Electrical Impedance Tomography (EIT)

The project focuses on reminding unconsciousness elders and patients with urological disease of urinating away from urinary incontinence. I used finite element model to simulate impedance characters of bladder and tissue around and EIT system. We found a correlation between bladder volume and impedance characters.

Publications:

Tzu-Kuan Chuang, Chun-Chih Teng, Sudeep Pillai, Chen-Hao Hung, Yi-Wei Huang, Chang-Yi Kuo, Teng-Yok Lee, Liam Paull, John Lenoard and Hsueh-Cheng Wang. Enable End-to-End Deep CNN Signage-Centric Text Spotting using Robot-Harvest Data. Submitted to IROS 2017.

Working & Teaching Experience:

Research Assistant: Tutorial in the IEEE International Robotic Computing Conference, 2017.

Teaching Assistant, Robotic Vision (Spring 2016, Spring 2017), Creative Software Project (Fall 2016), Biomedical Engineering Laboratory (Fall 2014, Fall 2015), Department of Electrical and Computer Engineering, NCTU, Taiwan

Professional Skills:

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

Middleware and Libraries: Robotic Operating System (ROS), lightweight communication and marshalling (LCM), OpenCV, EIGEN, Caffè

Sensors and Hardware: Google Tango device, Nvidia Jetson