

Samuel Leong Chee Weng

EXPERIENCED PROGRAMMER · INTEREST IN ROBOTICS AND EMBEDDED SYSTEMS

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Education

Carnegie Mellon University (CMU)

Pittsburgh, PA, USA

SOPHOMORE, ELECTRICAL AND COMPUTER ENGINEERING, ROBOTICS MINOR, DEAN'S LIST

Class of 2023

Key Classes Taken/Taking:

- 16-385: Computer Vision [A](#)
- 18-213: Intro. to Computer Systems [A](#)
- 15-122: Fund. of Imperative Programming [A](#)
- 21-241: Matrices and Linear Transformations [A](#)
- 21-259: Calculus in 3D [A](#)
- 21-260: Differential Equations [A](#)
- 36-225: Intro. to Probability Theory [A](#)
- 18-240: Struct. and Design of Digital Systems [A](#)
- 18-100: Intro. to ECE [A](#)
- 24-101: Fund. of Mech. Eng. [A](#)
- 85-241: Social Psychology [A](#)
- 85-377: Attitudes and Persuasion [A](#)
- 18-220: Analog Circuits and Devices
- 18-290: Signals and Systems
- 16-311: Intro. to Robotics
- 16-385: Human-Robot Interaction

Skills

Programming JavaScript, C/C++, Python, HTML5/CSS, NodeJS, Java, PHP/MySQL, Bash

Hardware Breadboarding/Soldering, TI-MSP430, Arduino

Languages English, Chinese, ASL

Experience

DSO National Laboratories

Singapore

RESEARCH INTERN: REAL-TIME RADAR ODOMETRY FOR ADVERSE WEATHER CONDITIONS USING PHASE CORRELATION AND LOCAL POSE-GRAPH ESTIMATION

Jun. 2019 - Aug. 2020

- Successfully implemented phase correlation and partially implemented local pose-graph estimation components of the [PhaRaO radar odometry paper by Park et. al.](#) in C++, using the OpenCV and Ceres Solver libraries.
- Algorithm to be adapted and actively used for organisation's unmanned ground vehicles. It will be part of a radar odometry pipeline, to supplement LiDAR for navigation in adverse conditions such as rain and dust.

CMU Human And Robotic Partners (HARP) Lab

Singapore

RESEARCH INTERN: EVALUATING MULTI-VIEW HUMAN POSE ESTIMATION ALGORITHM ON CMU

Feb. 2019 - Apr. 2019

PANOPTIC STUDIO AND OTHER DATASETS [LEARNABLE-TRIANGULATION-PYTORCH](#)

- Briefly evaluated various state-of-the-art methods for multi-view 3D human pose estimation, and sought to adapt the most suitable one for use on a dataset which the lab had collected prior.
- Successfully developed an open source toolkit in Python for evaluating the [CMU Panoptic Dataset](#) using [Iskakov et. al.'s learnable triangulation algorithm](#).
- Also worked on generalising the toolkit for use with general datasets, including that of the lab.
- Been approached by PhD students to help integrate my work into their active research.

DSO National Laboratories

Singapore

RESEARCH INTERN: INTEGRATED DATA ANNOTATION AND AUGMENTATION TOOL FOR OBJECT RECOGNITION AND TRACKING

Feb. 2019 - Apr. 2019

- Successfully developed a data annotation and augmentation tool in C#. The tool was integrated with a proprietary algorithm provided by our mentor (adapted from YOLOv2 and another proprietary tracking algorithm).
- Used the tool we developed to generate bounding box data, correct it manually, and augment it automatically. We then used the data for retraining the said algorithm.
- Also explored ways to improve the algorithm by adapting it for use with YOLOv3 and other trackers.

DSO National Laboratories

Singapore

RESEARCH INTERN: LOW-POWERED WIRELESS SOUND PROCESSING

Jan. 2017 - Feb. 2017

- Successfully implemented and tested algorithm for communication between a TI-MSP430 microcontroller and an ASIC Chip (*Application Specific Integrated Circuit*), via the Serial Peripheral Interface (SPI) Protocol.
- Implemented data transmission from said microcontroller to another via Wi-Fi, to allow for wireless data processing.
- Algorithm further modified by organisation for their internal applications.

DSO National Laboratories

Singapore

RESEARCH INTERN: OPTICALLY-ILLUMINATED DIRECTIONAL SENSING FOR GUIDANCE SYSTEMS ⓘ

Apr. 2015 - Mar. 2016

- Successfully prototyped an analog circuit capable of demodulating and amplifying a frequency-modulated laser signal.
- Programmed algorithm on TI-MSP430 Launchpad microcontroller to digitise analog input from circuit. Digitised signal then used to sense direction of laser-point, and actuate a novel omni-directional land robot.
- Represented Singapore at Intel International Science and Engineering Fair (ISEF).

DSO National Laboratories

Singapore

RESEARCH (TEAM): ANALYSIS OF MULTIMODAL INTERACTION METHODS FOR MULTI-TASKING ⓘ

Apr. 2014 - Jan. 2015

- Tested intuitiveness and efficiency of multiple interaction methods (eye-tracking, gestures, touch, speech and keyboard) in completing load-intensive tasks, via a custom-designed Flash game.
- Helped team design said Flash game, and a custom website to highlight advantages of eye-tracking.
- Presented to then Minister of State for Defence, Mr Maliki Osman, at the Young Defence Scientists Congress

Honors & Awards

UNIVERSITY

2019 **Dean's List**, Fall 2020, 4.0 GPA

Pittsburgh, PA, USA

2020 **Dean's List**, Spring 2020, 4.0 GPA but no dean's list due to COVID-19

Pittsburgh, PA, USA

2019 **Dean's List**, Fall 2019, 4.0 GPA

Pittsburgh, PA, USA

INTERNATIONAL

2016 **Finalist**, Intel International Science and Engineering Fair (ISEF)

Phoenix, AZ, USA

NATIONAL

2017 **Awardee**, DSTA Undergraduate Scholarship (Overseas)

Singapore

2016 **Gold, ISEF Delegate**, Singapore Science and Engineering Fair (SSEF)

Singapore

2014 **Bronze**, National Informatics Olympiad (NOI)

Singapore

2014 **2nd (Team), Bronze (Indv.)**, Singapore Physics Engineering Challenge

Singapore

2014 **Bronze**, Singapore Junior Physics Olympiad (SJPO)

Singapore

2014 **Outstanding Student Award**, Hwa Chong Institution (High School)

Singapore

2013 **Bronze**, Singapore Junior Physics Olympiad (SJPO)

Singapore

Extracurricular Activities

CMU Foosball Club

Singapore

VICE-CHAIRPERSON

2019 - Present

- Vice-Chairperson of the CMU Foosball Club. Revived the club after 6 years of inactivity, with another fellow enthusiast (current chairperson)

Hwa Chong Computer and Robotics Club

Singapore

CHAIRPERSON

2011 - 2016

- Chairperson of the Junior College (2016) and High School (2014) section of the club. Facilitated the merger and co-operation of the computer and robotics club.
- Gained expertise in web and game programming through self-motivated learning. Also trained for the National Informatics Olympiad, and attained bronze in 2013.
- Challenged my programming skills by participating in several team competitions:

2015 **3rd**, NYAA Canada-Singapore Website Design Competition

2015 **Consolation Award (4th)**, Singapore Games Creation Competition (SGCC) ⓘ

2014 **Finalist (Top 5)**, Splash Awards (*app prototyping competition*)

2014 **Commendation Award (Top 10)**, SGCC ⓘ