

Calvin Chua

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EXPERIENCE

UNSW School of Mechanical & Manufacturing Engineering

Casual Academic – MTRN4110 (Robot Design)

Jun 2021 – Present

I conducted tutorial to a class of 180 students and deliver course content focusing on develop an autonomous wheeled robots such as sensor selections, motion control, localisation, path planning, vision, and image processing. I also assist the lecturer in providing consultation, developing auto marker for assignments, setting up plagiarism checker, marking assignments and assisting students in their assignments on C++, Python, and course contents.

Casual Academic – MTRN4010 (Advance Autonomous System)

Feb 2021 – Jun 2021

I delivered three weekly tutorials to classes of 20-25 focusing on sensing, estimating, localization and control of autonomous systems. I assist students' assignments in the use of Matlab and assess their understanding.

Casual Academic – MTRN9400 (Control of Robotics System)

Sep 2020 – Dec 2020

I developed course materials for a new course with 100+ students. I prepared 15+ tutorial videos and developed a 20% weighted course assignment on Matlab. These focused on quadcopter modelling & control.

Maker Games Program – Assistive Technology & Seating

Student Rehabilitation Engineer

Jun 2020 – Dec 2020

I worked with a team of 6 engineering students from different majors to modify an electric wheelchair to enable quadriplegic persons to independently control their wheelchair. This involved patient interviews, and prototyping using Python, Arduino, IMU, Bluetooth & IR sensors. This project was supervised by a biomedical engineering lecturer, and an industry rehabilitation engineer.

Vtech Communication (Malaysia)

Mechatronics Engineering Intern

Dec 2019 – Feb 2020

I developed an IOT based system which monitors the temperature and humidity of production line. This included researching and prototyping solutions using Python, Raspberry Pi, ESP32 Wemos Lolin 32 & DHT22.

Space Ops Australia

Mechatronics Engineering Intern

Oct 2019 – Apr 2020

I worked in a startup in designing, manufacturing & analysing of Cube Satellite for education purpose. My responsibility included researching and prototyping using hardware like photoresistor, DHT11 & Microbit.

ELSOC UNSW & Schneider Electrics 2019 Hardware Hackathon

Participant – Team Project Manager

Sep 2019

I led a team of 5 to design an IOT autonomous window solution that would allow significant energy conservation. The solution outputs opening angles and tinting levels in response to external and internal conditions involving Arduino, DHT11, photoresistor & Bluetooth modules. We pitched in front of 50+ peoples including an electrical engineering lecturer and a representative from Schneider Electrics.

UNSW BLUESAT Rover Team - European Rover Challenge (ERC)

Student Mechanical Engineer

Jul 2017 – Nov 2018

We achieved 8th place worldwide in 2018 by designing and manufacturing the rover for the ERC. This included structure design, CAD design using Solidworks and CNC and 3D printed manufacturing.

UNSW Mechatronics Society – SUMOBOT Competition

Participant – Team Project Manager

Mar 2018 – Jun 2018

I led a team of 3 to design a sumo robot for a competition. This included designing the structure of the robot using Solidworks, manufacturing the robot using 3D printing and laser cutting, building the sensing and motion system using L298N module, DC motors, Arduino, IR sensors & ultrasonic sensors and developing the algorithm to knock down opponent in Arduino. The team achieved quarter final in the competition.

EDUCATION

University of New South Wales

BE (HONS) Mechatronics Engineering (Honours Class 1)

Graduated 2021

LANGUAGES

ENGLISH (Fluent), MANDARIN (Native Speaker), MALAY (Fluent), CANTONESE (Fluent)

EXTRACURRICULAR & COMMUNITY EXPERIENCE

UNSW Badminton Club

Treasurer

Apr 2019 – Present

I run two weekly badminton sessions with 40+ attendees and four yearly national tournaments with 200-300 attendees. I manage all club financials including budgeting, reporting, and supplier and sponsor payments. I also in charge on other work such as selecting uni-team, communicate with affiliate clubs on collaborations and provide coaching sessions.

Warrane College UNSW

Receptionist

Dec 2017 – Jan 2021

I dealt with basic administrative tasks and 20+ public enquiries per week.

RELEVANT PROJECTS

Neural Network – Business Review Prediction

Oct 2020 – Nov 2020

I worked in a pair to develop a Neural Network model achieving 85% accuracy when categorising business reviews using Python with a dataset of 3000+ business reviews.

Robot Design – Micromouse

May 2020 – Sep 2020

I developed a simulation project based on Micromouse competition on Webots using C++ and Python. This included sensors selection, vehicle control, path planning and analysis of maze images.

Robotics Localisation & Estimation – UGV

Feb 2020 – Apr 2020

I developed a Matlab program that solve a localization problem on UGV. This included performing sensor data fusion, identifying Object of Interests (OOIs) from LIDAR, estimating the UGV's position using dead reckoning and applying Extended Kalman Filter to increase the accuracy of the position of the UGV.

Image Processing – Medical Image Analysis

Oct 2019 – Nov 2019

I worked in pair to segment parts of retina using Python to develop a colour thresholder which achieved precision of 89% for optical disc, 86.7% for blood vessel, and a Convolution Neural Network (CNN) model with precision of 81.4% for blood vessel. My responsibility included researching the algorithms available, pre-processing the images, augmenting the data, developing and optimizing the algorithms.

OOP, Inter-process Communication, Process Management – System Integration of UGV

Jul 2019 – Aug 2019

I developed various independent modules using OOP in C++ including process management, laser, GPS, vehicle control, Xbox Controller and display. These modules interact with each other through shared memory and each module interacts their respective hardware on an UGV.

Engineering Design – Automated Kitchen

Jul 2018 – Oct 2018

I collaborate in a team of 6 to design an automated individual dish washer system for millennials, university students and white-collar workers. This included conducting surveys & questionnaire to the potential customers, analysing the data, demonstrating functional design, concept organisation, concept selection and concept improvement using Solidworks. We pitched to 70 people including the lecturer.

Mechanical Design & Machinery – Pump Project

Mar 2018 – Jul 2018

I worked in a team of 6 to design and manufacture a pump using Solidworks and workshop machines in TAFE.

REFEREES

[Dr Mohammad Deghat](#) | [Dr Jose Guivant](#) | [Arthur Escamilla](#) | [Carolyn Toh](#)