



# Ilyas Dawoodjee

BEng. Mechatronics Engineering, First Class Honors Graduate

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## EDUCATION

### National University of Singapore Master of Science in Built Environment

01 / 2023 - Present

Singapore

- Deferred to January 2024

### Asia Pacific University of Technology & Innovation (APU) Bachelor of Engineering (Hons.) in Mechatronics Engineering

11 / 2017 - 02 / 2022

Kuala Lumpur, Malaysia

- CGPA: **3.87/4.0**
- [Valedictorian](#) for Class of 2022 and **Outstanding Achievement Award**
- Member of the **Center for Research and Development in IoT Club (CREDIT Club)** - Worked on multiple different projects and joined competitions with some of those projects (06/2019 - 02/2022)

## SKILLS

**SOFTWARE** Proficient in **Python** (Machine Vision, Machine Learning, Signal Processing), **MATLAB** (Simulink, App Designer, Digital/Analogue Signal Processing), **SolidWorks** (2D Sketch, 3D Modelling, FEA), **Arduino IDE**.

Experience in **SolidCAM** (Milling, Turning), **RAPID Programming Language**, **LTSpice**, **CNC Simulator** (Milling, Turning), **LabVIEW**, **Automation Studio** (PLC, Electro-pneumatics), **Multisim** (Digital Electronics), **Dart** (Flutter, Mobile App Development), **JavaScript**, **HTML**, **CSS** (Front End Web Development), **Git/GitHub**.

**HARDWARE** Soldering, Electrical Circuit Wiring (BJTs, Logic Gates, Arduino, Raspberry Pi),

**LANGUAGE** English (IELTS: 8.0/9.0 - 2022) and Burmese

## WORK EXPERIENCE

### Research Engineer National University of Singapore

04/2022 - Present

Singapore

Department of The Built Environment

- **Developing and implementing** the detection of heart rate in a non-intrusive way:
  - **Working** on a project that **detects heart rate** using machine vision **from a person's face** by utilizing a **simple RGB camera** - called **remote Photoplethysmography (rPPG)**
  - Conducted **in-depth research** on **papers** and **algorithms** related to various **rPPG techniques**, while also **recreating** some of the **algorithm implementations** ([https://github.com/blank-ed/remote\\_PPG](https://github.com/blank-ed/remote_PPG)).
  - Demonstrated a **profound comprehension** of **experimental methods** and conducted **thorough analysis** of **results**. Additionally, designed a **comprehensive database** for comparison of **rPPG heart rate** with **ground truth heart rate**.
- **Implemented** the **detection of real-world people and objects**, **updated live** in a Game Engine platform (Unity):
  - **Detected real world coordinates** of a person using **YoloV3** relative to a **designated local origin (door)** and updated it in a software model of that room (**Digital Twin**) in **Unity** via **AWS** to **simulate real-time movement** of a person.
- **Automated the processing and cleaning of a Terabyte worth of building science data**:
  - Assisted with **data visualization**, and **mathematical modeling** for analysis, to **understand the effect of different occupancy profiles on the selection of setpoints of the HVAC system**.
- **Developed a website for Building Robotics Lab**:
  - Using **HTML**, **CSS**, and **JavaScript** to develop a website, to showcase research projects and increase online visibility.
  - Hosted the website via GitHub (<https://blank-ed.github.io/brl/>)
- **Assisted the development of a low-cost multi-sensing device**:
  - **Designed and developed the code** for a **low-cost multi-sensing device** that can **measure human-centric indoor environmental quality (IEQ) parameters**, which was later **utilized by undergraduate thesis students** for their **project**.
  - Assisted in the **experimental setup** of the device for their undergraduate thesis.

Contact: Dr. Ali Ghahramani - [ghahramani@nus.edu.sg](mailto:ghahramani@nus.edu.sg)

## Research Assistant

### Asia Pacific University of Technology & Innovation

02/2020 - 05/2020

Kuala Lumpur, Malaysia

Assigned to CREDIT Club in the School of Engineering

- Built and **customized** a carbon fiber **hexacopter drone** (> 8 kg, 50x50x40 cm) for **trimming tree branches**.
- **Participated** in the MyDroneX University **Drone Competition** and received **1st Runner Up** organized by Futurise and MDEC: **(06/2019)**
  - A team of 3 presented a Self-Charging Drone for Inventory Update
  - Developed an **autonomous self-charging drone**, using DJI Tello with a pre-programmed flight path based on the warehouse layout, where it **scans bar codes** on the shelves and **automatically updates the inventory in real-time**, consequently **eliminating** the require simulating **real-time movement** of a person.
  - Exhibited the MyDroneX project at Putrajaya International Convention Centre (PICC) for Industrial Revolution 4.0 Education Colloquium

Contact: Ir. Dr. Alvin Yap Chee Wei - [alvinyap168@gmail.com](mailto:alvinyap168@gmail.com)

## Intern

### EHM Global Sdn Bhd

11/2020 - 01/2021

Kuala Lumpur, Malaysia

Engineering Division

- Built a **quadcopter drone** and **integrated machine vision** for the inspection of pipeline construction.
- Developed a MATLAB program to automatically recognize the music that is playing by using signal analysis (FT).

Contact: Sharul Ehsan - [contact@ehmglobal.com.my](mailto:contact@ehmglobal.com.my)

## Tutor

### Self-Employed

Kuala Lumpur, Malaysia

01 / 2021 - 02 / 2022 Kuala Lumpur, Malaysia

- **Tutored** juniors from formerly completed modules (**Control Engineering, Communication Engineering Principles, Engineering Statics and Dynamics, Strength of Materials, Digital Electronics**)
- Assisted students with **critical analyses, reports, and thesis writing**.

## UNIVERSITY PROJECTS

- Final Year Project: Machine Vision Analysis for Anomaly Detection in a Controlled Environment (02/2021 - 10/2021)
  - Designed an **Exam Proctoring System** to observe students and maintain exam integrity during COVID-19.
  - Utilized **Machine Vision & Machine Learning** techniques to identify & verify students before they take their exams by facial recognition, detect & track objects such as the usage of phones during the exams, and process images to check if they are talking or looking around.
  - As a part of the [Artificial Intelligence for SMES \(AI4S\)](#) Program Inception, my university, **Asia Pacific University, received a prize** valued at approximately **75,000 USD** for the development of the automated exam proctoring system.
  - Created a comprehensive [GitHub](#) repository outlining the system setup and explanation, including necessary third-party software & libraries.
- Smart Environment Detection System for Vehicles (02/2021 - 06/2021)
  - Designed and developed a **smart environment detection system** for transportation of cars.
  - The overall project was developed with 5 teammates with the personal individual component being a **real-time weather classification system** using machine vision and machine learning.
  - The **maximum allowable speed** for that particular road is then **dynamically changed depending on the weather**, which in return can potentially reduce road accidents.
  - Utilized **TensorFlow Lite Model Maker to train** a model with 4400 images, containing four different weather types.

## PERSONAL PROJECTS

- Cost Calculator (2021)
  - Developed an **android based mobile application** using **Dart (Flutter)** to **calculate the monthly bills** owed by my housemates to me based on the **different cost of rent** for their individual rooms, electricity & water bill, lent & borrowed money, and additional costs.
- Head Position Recognition (2021)
  - Trained and implemented a **machine learning model** to **recognize different head orientation** based on deep **neural network** using **LSTM** (Long Short-Term Memory) layers with **Tensorflow** and **Keras**, utilizing sequence of keypoints obtained from user's face using **MediaPipe**.
- Voice Recognition (2021)
  - Developed a MATLAB program that records, analyzes, stores, and detects the voice of specific users from their pitch based on signal analysis.

## VOLUNTEER EXPERIENCE

### Student Mentor

[Bridge Burma](#)

01 / 2020 - Present

Yangon, Myanmar

- **Guiding Myanmar high school graduates** interested in **studying in Malaysian universities** based on their passion and background.