TIANYI **LIM**

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I am a driven and resourceful Computer Engineering student passionate about solving problems with hardware and software.
I am looking to deepen my multidisciplinary skills in **Robotics**, specifically in **autonomy** and **perception**.

EDUCATION

BENG ELECTRONIC AND INFORMATION ENGINEERING, IMPERIAL COLLEGE LONDON

SEP 2019 – JUN 2022

- Final-year student focusing on Computing and Robotics modules with a background in topics in Electrical Engineering.
- Relevant Modules: *Robotics, Embedded Systems, Algorithms and Complexity, Signals and Systems.*
- On track to graduate on the Deans' List (top 10% of cohort).

PROFESSIONAL EXPERIENCE

INTERN, DSO NATIONAL LABOROTORIES, SINGAPORE

JUL 2021 – SEP 2021 – *Robotics Division / Robotic Autonomy*

- Optimized a neural network used to process a LIDAR point cloud using **C++** and **Python**.
- This was used to register points in multiple point clouds to merge them using an ICP algorithm for multi-robot mapping.
- Refactored the network from **TensorFlow** 1 to 2, and migrated inference to **TensorRT**, speeding inference by 100%.
- Tools used: *Python, C++, Bash, TensorFlow, ONNX, TensorRT, Netron, Eigen, Docker*

JUN 2020 – AUG 2020 – *Sensors Division / Satellite Program*

- Developed an FPGA overlay in **VHDL** for hardware acceleration of resolving Synthetic Aperture Radar images.
- Evaluated signal processing algorithms for speed in Python and before implementing them in hardware.
- Used the PYNQ system to marry the convenience of **Jupyter Notebooks** with the speed of FPGAs.
- Tools used: *Verilog, VHDL, Vivado, Python, Numpy, Scipy*

APR 2019 – JUL 2019 – *Guided Systems Division / Unmanned Aerial Vehicle Division*

- Developed an embedded solution to receive and transmit FM remotely via data link using Raspberry Pi and Arduino.
- Fabricated prototype components using CAD and 3D printing, designed a proof-of-concept PCB with **KiCad**.
- Tools used: *Arduino, KiCad, Fusion 360*

SKILLS

COMFORTABLE	**DEVELOPING**
Python, C/++, Verilog/VHDL, Git, Linux, Fusion 360	JavaScript, TensorFlow, OpenCV, ROS, KiCad

PROJECTS AND OTHER EXPERIENCE

VISION SUBSYSTEM, YEAR 2 ELECTRONICS DESIGN PROJECT

APR 2021 – JUN 2021

- Implemented sequential CV algorithms such as the Hough Transform and HSV-based color filtering on hardware using **Verilog** on an Intel MAX-10 FPGA with an embedded Nios II soft processor to detect objects of interest, sending relevant stimuli to an ESP32, which then communicated with an online server for mapping.

BATHROOM GUARDIAN, IMPERIAL ROBOTICS DESIGN HACKATHON

FEB 2021

- Devised a bathroom-door mounted system designed to detect falls and accidents while preserving users' privacy.
- Utilized a camera and a LBPH face recognition algorithm to identify individuals and an accelerometer to detect the opening and closing of doors.
- Won the Intelligence at the Edge prize.

TEAM LEAD, IMPERIAL COLLEGE ROBOTICS SOCIETY SUMOBOT COMPETITION

DEC 2019 – FEB 2020

- Led a team of 8 in hardware and software development of an autonomous Sumo-robot for a university-level competition.
- Designed a 4-wheel drive robot chassis in **Fusion 360**, with dynamic power control and multiple TOF sensors.

TEAM LEAD/CLUB PRESIDENT, ROBOCUP JUNIOR SOCCER OPEN CATEGORY

JAN 2016 – JUN 2016

- Represented Singapore at the high-school level internationally at Robot Soccer in a team of 4.
- Designed the chassis of a pair of holonomic robots that seek out an infrared "soccer" ball. Robots were made of laser-cut aluminum sheets designed in **AutoCAD** with 3D-printed add-ons designed in **SketchUp**.
- Designed a circuit to charge and discharge a capacitor to fire a solenoid to "kick" the soccer ball.
- Attained 10th place overall.