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 at the intersection of **cognition** and **action**.

EDUCATION

BENG ELECTRONIC AND INFORMATION ENGINEERING, IMPERIAL COLLEGE LONDON (ONGOING)
SEP 2019 – JUN 2022

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

MSC ROBOTICS, SYSTEMS AND CONTROL, ETH ZURICH (INCOMING)
SEP 2022 – DEC 2023

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, Bash Scripting, KiCad, Fusion 360*

PROJECTS AND OTHER EXPERIENCE

ROBOTIC MANIPULATION COURSEWORK, FINAL YEAR PROJECT (ONGOING)
FEB – JUN 2022

- Developing a multi-robot local planner for differential drive robots using factor graph inference.
- Evaluating the proposed algorithm in a simulated environment using **ROS** and **Gazebo**.

ROBOTIC MANIPULATION COURSEWORK, 3RD YEAR ROBOTIC MANIPULATION MODULE
FEB – MAR 2022

- Implemented a velocity control scheme in **MATLAB** for a 4-DOF OpenManipulator arm for coursework requirements.
- Used a A* search path planning scheme in conjunction with quintic waypoint interpolation to obtain joint trajectories, which were then followed using a Feedforward PID control scheme.

ROBOTIC NAVIGATION CHALLENGE, 3RD YEAR ROBOTICS MODULE
FEB 2022

- Implemented an Adaptive Monte Carlo Localization algorithm from scratch for a simulated differential drive robot using **Lua** in **CoppeliaSim** as part of a non-graded challenge, eventually winning.

VISION SUBSYSTEM, 2ND YEAR 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.