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
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.*
- Final Year Project on Multi-Robot path planning in a warehouse setting, supervised by Professor Andrew Davison.
- 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*

PROJECTS AND OTHER EXPERIENCE

MULTI-ROBOT PATH-PLANNING FOR ROBOTS IN A WAREHOUSE SETTING, FINAL YEAR PROJECT
FEB – JUN 2022

- Developing a multi-robot local planner for differential drive robots.
- Implemented a variant of the Dynamic Window Approach (DWA) for local planning.
- Implemented a global planner with the RRT(*) algorithm.
- Evaluated the algorithms developed in a simulated environment using **ROS2** and **Gazebo**.

IMPERIAL DRIVERLESS, FORMULA STUDENT – AI COMPETITON
MAY – JUL 2022

- Participated in Imperial College's Driverless team's first year competing at the FS-AI competition.
- Helped in developing **ROS2** software for driverless cars in a motorsport setting.
- Aided in building team infrastructure for future years in competition.

TEAM LEAD, EUROBOT COMPETITION
JAN – MAY 2022

- Designed the electronic hardware and mechanisms for two robots for the Eurobot competition using **Fusion 360**.
- Led a team of 8 members of varying skill levels.
- Used **OpenCV** along with ARUCO tags for robot localization.

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.

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.