# TIANYI **LIM**

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I am a driven and resourceful Robotics 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 **perception**.

## EDUCATION

**MSC ROBOTICS, SYSTEMS AND CONTROL,** ETH ZURICH (CURRENT)
**SEP 2022 – SEP 2024**

- Relevant Modules: *Planning and Decision-Making for Autonomous Robots, Vision Algorithms for Mobile Robots, Dynamic Programming and Optimal Control, Machine Perception, Computational Control*

**BENG ELECTRONIC AND INFORMATION ENGINEERING,** IMPERIAL COLLEGE LONDON
**SEP 2019 – JUN 2022**

- Focused 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.
- Graduated in the top 10% of cohort.

## PROFESSIONAL EXPERIENCE

**INTERN,** EMBOTECH AG, SWITZERLAND (ONGOING)
**AUG 2023 – FEB 2024** – *Safety and Systems Engineering Team*

- I will be assisting with Perception for L4 autonomous vehicles, aiming to develop a robust, multimodal perception stack. My focus is with LiDAR-based perception.
- Tools used: *C++, ROS, Docker*

**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++, TensorFlow, TensorRT, Docker*

## PROJECTS AND OTHER EXPERIENCE

**F1TENTH LOCALIZATION ENGINEER,** ETH SEMESTER PROJECT
**FEB – JUN 2023**

- Evaluated **SLAM**-based and **Particle Filter**-based localization methods for a 1/10$^{th}$ scale autonomous race car for the F1TENTH competition. Assisted with the development of **ROS**-based infrastructure for the car.
- Implemented an improved Particle Filter method building upon multiple sources in literature and outperforming those in the context of the competition. Thesis link.
- Along with the *ForzaETH* team, **won** the F1TENTH Grand Prix at ICRA 2023.

**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. Thesis link.
- 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.

**ROBOTIC MANIPULATION COURSEWORK,** 3$^{RD}$ YEAR BACHELORS' 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.