Rohan Gangakhedkar

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EDUCATION

Masters of Science in Mechatronics and Robotics — 2021 – 2023
*New York University - **GPA** - **3.97*** — *New York, USA*

Bachelor of Mechatronics Engineering (Honours) w/ First Class Honours — 2017 – 2020
The University of Auckland — *Auckland, New Zealand*

EXPERIENCE

New York University, AI4CE Lab — New York, USA
Robotics Research Assistant — *2022 – 2023*

Mobile 3D Printing
- Designed and integrated a **PCB** with an **NVIDIA Jetson** to unify the systems of a mobile 3D printing robot.
- Managed the design and creation of a **multi-DOF robotic arm**, enabling optimized control for 3D printing.
- Built a simulation environment in **Gazebo** and **Python** to validate the systems of the robot.
- Constructed a multi-camera system, producing real-time panoramic views through seamless image stitching.

Robinson Research Institute — Wellington, New Zealand
Mechatronics Research Assistant — *2020 – 2021*

Portable Brain Imaging MRI System
- Established a communication pipieline for embedded hardware, for a Superconducting Magnet Monitoring System (MMS) and external peripherals using **I2C**.
- Performed validation testing on the embedded software systems of the MMS.
- Designed a **PCB** for the MRI technician remote using **Altium**, and implemented its control with a PLC.
- Assembled the electronics of the MMS with various **DIN rail** mounted component.
- Utilised **Solidworks** and rapid prototyping to design and fabricate components and parts for the MMS.

Compac Sorting Equipment - TOMRA Food — Auckland, New Zealand
Summer Intern - Product and Process Quality Engineer — *2019 – 2020*
- Proposed a new and improved testing methodology, applying quality Engineering and Statistical methods.
- Applied **GR&R** to evaluate the accuracy of fruit grading instruments.

PROJECTS

LoFTR Feature Matcher Reimplementation
New York University
- Re-implemented a state-of-the-art **machine learning** based image feature matching algorithm (**LoFTR**) from **PyTorch** into **Tensorflow**.
- Developed a custom training loop and custom loss function to implement gradient descent on the model.
- Implemented a novel **transformer architecture** to improve the feature extraction of image pairs.

Motion Planning for a Quadrotor
New York University
- Implemented a project in **Python** to discretize and linearize the complex, non-linear dynamics of a quadrotor.
- Engineered a tracking controller and **path planning algorithm** to guide the quadrotor along a trajectory.
- Developed and executed an iterative LQR controller (**iLQR**) for flipping a quadrotor 360° mid-flight.

Vision Based Localization of a Quadrotor
New York University
- Applied advanced filtering techniques to develop **Kalman**, **Extended Kalman** and **Unscented Kalman Filters**, successfully enabling the localization of a quadrotor in 3D space.
- Utilized **MATLAB** to implement **sensor fusion**; successfully combining camera-based vision data with an IMU, delivering a robust and reliable sensing solution.

TECHNICAL SKILLS

Programming: Python, C, C++, PLC Ladder Programming
Electronics: PCB Design (Altium), Embedded Programming
Tools: ROS, Solidworks, CREO, Fusion 360, MATLAB, LATEX