# Rohan Gangakhedkar

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## EDUCATION

**Masters of Science in Mechatronics and Robotics**                                      Sep. 2021 – May. 2023
*New York University - **GPA** - **3.96***                                                                     *New York, USA*

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

## EXPERIENCE

**Robotics Research Assistant**                                                                     2022 – Present
*New York University, AI4CE Lab*                                                                     *New York, New York*

### Mobile 3D Printing (PCB Design, Python, C++, ROS)

- Designed, integrated and deployed a PCB to unify the motion, and printing systems of a mobile 3D printing robot.
- Spearheaded the design and creation of a multi-DOF robotic arm, enabling optimized control for 3D printing.
- Built a simulation environment in Gazebo to validate the movement systems and printing operations of the robot.
- Constructed a multi-camera system, producing real-time panoramic views through seamless image stitching.

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

### Portable Brain Imaging MRI System (PCB Design, PLC Programming, Embedded Systems)

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

**Summer Intern - Product and Process Quality Engineer**                                   2019 – 2020
*Compac Sorting Equipment - TOMRA Food*                                                     *Auckland, New Zealand*

- Proposed a new and improved testing methodology, applying quality Engineering and Statistical methods.
- Applied Gage repeatability and reproducibility (GR&R) to evaluate the accuracy of fruit grading instruments.

## PROJECTS

### Motion Planning for a Quadrotor (Python)

*New York University*

- Devised and implemented a project 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 desired trajectory.
- Developed and executed an iterative LQR controller (iLQR) for flipping a quadrotor 360° mid-flight.

### Vision Based Localization of a Quadrotor (MATLAB)

*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 advanced sensor fusion techniques to successfully combine camera-based vision data with an IMU, delivering a robust and reliable sensing solution.

### Inverting a Pendulum with Model-Free Reinforcement Learning (Python)

*New York University*

- Implemented model free Q-learning to learn a policy to invert a pendulum.
- Modified the control effort and adjusted and discount rates to optimise performance.
- Created a visualisation to observe the value function and optimal policy for each control effort.

## TECHNICAL SKILLS

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