Aaron Tran

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EDUCATION

University of Michigan — **Ann Arbor, MI**
*Master of Science in **Robotics*** — April 2024
GPA: 4.00/4.00

California Polytechnic State University, San Luis Obispo — **San Luis Obispo, CA**
*Bachelor of Science in **Mechanical Engineering,** concentration in **Mechatronics*** — March 2022
Honors: summa cum laude (GPA: 3.94/4.00)

SKILLS

Programming Languages: C++, Python, MATLAB
Frameworks: ROS2, lcm, MoveIt, Klamp't , PyTorch, OpenCV, NumPy, Jax, Carla, RTOS
Hardware: Arduino, STM32, Raspberry Pi, UART
Other: Linux, Git, Docker, SolidWorks, OnShape, Inventor

WORK EXPERIENCE

Brembo Inspiration Lab — **Sunnyvale, CA**
Control Software Engineer — October 2024 – Present

- Automate SIL testing and report generation with a MATLAB script, enabling developers to test up to 20x as often
- Write electronic brake counter diagnostic counters using Simulink, Stateflow, and TargetLink
- Build braking simulation considering nonlinear tire dynamics and slip ratio
- Develop vehicle level braking controls algorithm that forgoes need for forces sensor and friction estimation

Image Guided Medical Robotics Lab — **Ann Arbor, MI**
Graduate Research Assistant — September 2023 – April 2024

- Write planning algorithms such as RRT and SBL in Python with MoveIt2 and Klamp't
- Improve upon sample-based planners with model-based planners such as MPPI, iCEM and STORM in Python with PyTorch and IsaacGym
- Work with Docker and ROS2 to create a modular, easy to prototype and deployment ready system
- Build simulator to test motion planners prior to deploying on hardware

EverestLabs.ai — **Fremont, CA**
Robotics Intern — May 2023 – August 2023

- Write machine learning model for robot grasp detection, optimizing for minimal Type I and Type II error
- Automate data collection and storage using Arduino, Amazon Kinesis and boto3 with Python
- Assist data labeling team by writing an intuitive data labeling GUI with tkinter in Python
- Deploy YOLOv8 model using the ROS2 Python API for online brand detection

PROJECT EXPERIENCE

Quadcoptor Control — June 2024 – March 2025

- Build simulator using pydrake
- Write controllers for a quadrotor with a quaternion representation for orientation in pydrake

Hydraulically Powered Exo – UCSF BioRobotics — May 2023 – August 2023

- Build hand exo compatible with brain signal analysis for monitoring engagement during physical therapy
- Write Kalman filter to estimate actuator state given noisy load cell and potentiometer data
- Implement controller on Arduino to assist patient over a hydraulic line

Autonomous Differential Wheel Robot — February 2023 – April 2023

- Program a robot for autonomous exploration and mapping using C++ and lcm
- Design and implement cascade PID control loop for waypoint following
- Implement SLAM algorithm using particle filter and log odds mapping, achieving up to 2cm accuracy
- Write A* algorithm to efficiently solve minimal distance plans to goal

Pick and Place Robot Arm — January 2023 – February 2023

- Program 5 DOF manipulator to autonomously identify, sort, and stack various objects using Python, OpenCV, and ROS
- Derive robot kinematics to map between joint angle and cartesian space representations
- Write routine for calibrating computer vision mapping between image and world coordinates
- Design computer vision algorithm for object segmentation and identification
- Write heuristic planner for stacking and sorting without disturbing other stacks