

Muhammad Fadli Alim Arsani

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EDUCATION

University of California San Diego

San Diego, CA

M.S. Intelligent Systems, Robotics, & Controls - Electrical Engineering

Fall 2024 - June 2025

- Planned courses: Sensing & Estimation in Robotics, Advanced Computer Vision, Robotics Planning & Learning, Robot Reinforcement Learning, Linear Systems Theory, Nonlinear systems, Statistical Learning, Multi-Agent Systems

University of California San Diego

San Diego, CA

B.S. Electrical Engineering - Machine Learning & Controls (GPA: 3.92)

Fall 2020 - June 2024

- Relevant courses: Robotics, Computer Vision, Deep Learning, C++, Python For Data Analysis, Linear and Non-Linear Optimization, Machine Learning Algorithms, Intro To Autonomous Vehicles, Controls Theory, Signals and systems, Data Structures and algorithms, C Programming, Circuits Theories

TECHNICAL SKILLS

Programming Language: C++, Python, C

Concepts/Libraries: ROS2, Point Cloud Library (PCL), OpenVDB, PyTorch, OpenCV, Eigen, Boost, Numpy, Parallel Programming, Image Processing, Object Detection & Recognition, Behavior Trees

WORK EXPERIENCE

Perception Software Engineer Intern (Autonomous Driving)

Pittsburgh, PA

Moss Robotics Inc.

July 2023 – September 2023

- Overcome limitations of single-scan LiDAR data by implementing a **point cloud accumulator** module.
- Improved detection output and enabled **real-time tracking** by developing a **multi-sensor fusion** module.
- Automated tree/pot counting and tree block identification by introducing a **graph-based** approach.
- Improved **tree detection** and **row-following** accuracy with density-based clustering and parallel line fitting.
- Enabled zero-intervention row-to-row navigation by building an **exit detection algorithm**.
- Enhanced real-time performance by enabling **multi-threaded**, **thread-safe** perception stack components.
- Developed all the software **entirely in C++**.

Research Software Engineer

San Diego, CA

Existential Robotics Lab, Contextual Robotics Institute (CRI) UC San Diego

September 2022 – June 2023

- Built implementations & visualizations of **mobile robot algorithms** for **localization**, **mapping**, & **controls**.
- Implemented various robotics algorithms like **Octree Mapping**, **Particle Filter**, **SLAM**, **A* search**, etc.
- Worked with **point cloud data** in the simulation (retrieving, processing, etc.).
- Programmed a **navigation environment** in **PyBullet real-time physics simulation engine**.
- Developed all the software **entirely in Python**.

Research & Software Engineer Intern

San Diego, CA

Autonomy Lab, Contextual Robotics Institute (CRI) UC San Diego

March 2022 – September 2022

- Deployed **Reinforcement Learning policy** on **Unitree A1** robot enabling it to navigate challenging terrains.
- Worked with **depth camera (Intel RealSense D435)** and other sensors on the robot.
- Collected **real-world data** to bridge the gap between **Sim2Real** and uncertainties in the real world.
- Utilized **GPU clusters** and other MLOps tools like **Kubernetes** and **WANDB** to train the models.

PROJECTS

BEDSR - Budget Enhanced Deep Residual Networks for Single Image Super-Resolution

Winter 2022

PyTorch, Python, Deep Learning, Computer Vision

- Designed and implemented a **resource-constrained neural net**, inspired by Bee Lim et al. **EDSR** paper.
- Achieved an average peak signal-to-noise ratio (**PSNR**) of **33.43 dB** on popular SR datasets.
- Built and wrote the entire model, training & testing pipelines, data preprocessing, etc. from scratch.