

# Rajiv Bharadwaj

[rbharadwaj9](#) | [rajivbharadwaj](#) | [spdrajiv@gmail.com](mailto:spdrajiv@gmail.com) | [+1.734.881.4167](tel:+17348814167)

Experienced software engineer aiming to explore research opportunities in robotics through graduate school.

## EDUCATION

---

### University of Michigan, Ann Arbor

Sep 2018 - May 2022

*Bachelor of Science in Engineering, Computer Engineering; Minor in Music*

*summa cum laude*

**Honors:** Dean's List for 7 semesters, James B. Angell Scholar 2020, 2021

GPA: 3.9/4.0

**Coursework:** Algorithmic Robotics, Embedded Control Systems, Operating Systems, Machine Learning, Computer Vision

**Projects:** [Fast-Converging Depth Estimation using Transfer Learning](#), [Comparing Kalman and Particle Filters for Localization](#)

**Clubs and Societies:** Men's Glee Club, Michigan Student AI Lab, UM Autonomous Robotic Vehicle, Michigan Sahana

## WORK EXPERIENCE

---

### Amazon.com

Seattle, WA

*Software Development Engineer - Social Marketing*

Oct 2022 - present

- Designed and implemented an automated system to improve the quality of Amazon products advertised on Social Media using Spark, Alster Deequ, AWS Lambda.
- Subject Matter Expert for design and coding practices for Apache Spark based ETL jobs within the team.
- Leading Operational Excellence efforts within the team, including task grooming, incoming ticket management, and sharing best practices.

*Software Development Engineer Intern*

May 2021 - Aug 2021

- Migrated several legacy big data ETL jobs to a new framework based on Apache Spark for long term operational excellence.
- Yielded faster job runtimes and reduced costs by optimizing and parallelizing queries based in Apache Spark.

### Analog Garage - Analog Devices Inc.

Boston, MA

*Systems & Applications Engineering Intern*

May 2020 - Sep 2020

- Assessed compatibility issues of various sensor drivers associated with autonomous vehicle technologies with the latest robot operating system (ROS) release - ROS Noetic.
- Architected an Azure NoSQL database to store ML datasets and built a Python API for teams to query and train their models.

### University of Michigan Information and Technology Services

Ann Arbor, MI

*Application Development Intern*

May 2019 - May 2021

- Implemented and deployed various web APIs and plugins using the Django framework for Python to create robust and maintainable tools for the ITS Networking service.

## RESEARCH

---

### Wire Harnessing using Reachability based Trajectory Design

Ann Arbor, MI

*University of Michigan ROAHM Lab, Advisor: Dr. Ram Vasudevan*

Jan 2022 - July 2022

- Implemented an RRT planner for Kinova Gen3 within Robosuite for high level planning.
- Implemented a Recursive Newton-Euler Algorithm low level controller to used to evaluate the performance of a novel robust controller approach.
- Performed System Identification tasks to bridge the Sim2Real gap when performing tasks on the robot.

### High-Level Lane Changing Algorithms for Autonomous Trucks

Ann Arbor, MI

*Isuzu Technical Center of America - Multidisciplinary Design Team, Advisor: Prof. Grant Kruger*

Jan 2021 - Dec 2021

- Implemented a birds-eye view occupancy grid in CARLA to detect neighboring vehicles and reachable lanes.
- Utilized Deep Reinforcement Learning in PyTorch along with OpenAI Gym and CARLA for simulation.
- Formulated a concrete project plan with specific goals, technical requirements, risks, and contingencies to tackle over the course of the project and presented it along with the team to our sponsors, Prof. Kruger, and the MDP staff.

## Applications of Passive Dynamic Walking Mechanisms

Ann Arbor, MI

*Michigan Undergraduate Research Program, Advisor: Prof. Lauro Ojeda*

Sep 2018 - May 2019

- Designed and prototyped a printed circuit board that incorporated various sensors communicating over the I2C protocol including an inertial measurement unit to improve sensing capabilities.
- Worked on enhancing the pre-existing state machine software to reduce latency and lower memory consumption.

## PROJECTS

---

### University of Michigan Autonomous Robotic Vehicle

Ann Arbor, MI

*Computer Vision Team Engineer*

Sep 2021 - Jul 2022

- Implemented white-line detection algorithms using a stereo camera as a part of the perception stack of the vehicle.
- Simplified the perception stack into a deployable unit of ROS nodes for easy setup.

### Michigan Electric Racing

Ann Arbor, MI

*Controls Team Engineer*

Sep 2019 - Dec 2020

- Programmed a Custom STM32 PCB to read CAN messages from various sensors and systems and show data to the driver's dashboard
- Interfaced various sensors on a testbench using the CAN protocol to evaluate and program the systems before integrating them on the car.

## SKILLS

---

Programming: C++; Python: PyTorch, OpenAI, OpenRAVE, OpenCV, Django; Java, Scala, Apache Spark; Lua, Embedded C, Verilog

Tools: Robot Operating System (ROS), AWS, AWS CDK, Linux, Git, FPGAs, STM32, Arduino, Raspberry Pi, Autodesk Eagle, Bash