

Arun Lakshmanan

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Summary

I am currently working as a software engineer at Optimus Ride in the Planning and Controls team where I focus development efforts on modern control techniques that provide rigorous safety guarantees for autonomous vehicles. Before joining the industry, I completed my PhD from the University of Illinois, where I was advised by Prof. Naira Hovakimyan. Broadly, my research was at the intersection of robotics, control theory, and machine learning, where I focused on safe motion planning for robots under uncertainty.

Education

Ph.D. in Mechanical Engineering, Aug 2021.

University of Illinois Urbana-Champaign, Urbana, IL.

M.S. in Aerospace Engineering, Dec 2016.

University of Illinois Urbana-Champaign, Urbana, IL.

B.Tech. in Mechanical Engineering, May 2014.

VIT University, Vellore, India.

Employment History

Software Engineer

Optimus Ride, Planning and Controls Team

Sep 2021 - present (Boston, MA)

- Produced a design document rigorously detailing the safety requirements and the associated assumptions for an autonomous vehicle from a controls perspective.
- Documented the design of a model predictive control algorithm with computational, stability, and feasibility guarantees.

Research Intern

Facebook Reality Labs, Computational Imaging Team

May 2018 - Aug 2018 (Redmond, WA)

- Performed system identification for a controlled hardware device.
- Implemented a disturbance observer-based control augmented with a baseline PID control to compensate for disturbances injected into the system while accurately tracking reference signals.

Research Intern

Paracosm (a division of Occipital)

May 2017 - Jul 2017 (Gainesville, FL)

- Designed a C++ library for generic motion planners that allows for easily swapping between different types of motion planner for a wheeled robot mounted with a Structure sensor.
- Implemented a computationally efficient distance transform of an occupancy map for fast collision checking and distance-based prioritization when planning.

Research Intern

Qualcomm Research

May 2016 - Aug 2016 (Philadelphia, PA)

- Designed an obstacle avoidance controller for the Snapdragon Flight board (since discontinued) for assistive collision prevention using noisy vision-based range information.
- Developed sampling-based motion planning algorithms to generate distance-optimal collision-free paths for the vehicle from a 3D occupancy map.

Research Overview

Software Experience

Publications