

Aravind Kumaraguru

RESEARCH ASSISTANT @ USC RESL · SOFTWARE ENGINEER · ROBOTICIST

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Software engineer looking for a full-time position with a focus on robotics software and systems.

Education

University of Southern California

M.S. IN COMPUTER SCIENCE (GPA: 3.95)

Los Angeles, CA

Aug 2018 - May 2020

University of California, Berkeley

B.S. IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCE (GPA: 3.75)

Berkeley, CA

Aug 2013 - May 2017

Experience

USC Robotics Embedded Systems Laboratory

RESEARCH ASSISTANT

Los Angeles, CA

Aug 2018 - Current

- Collaborated with a team of biologists to autonomously monitor harmful algal blooms in Clearlake, CA with aquatic robots.
- Researched methods to improve sample efficiency in reinforcement learning through topologically structured, curiosity-driven exploration (TMAX).
- Developed smoothing and mapping algorithm for BlueQuilt, a framework that can orthomosaic images over open water.

Cisco Meraki

SOFTWARE ENGINEER

San Francisco, CA

Aug 2017 - Aug 2018

- Worked as a platforms engineer to bring up Z3C mobile teleworker gateway with integrated LTE and WiFi.
- Tasks included bootloader configuration, implementing hardware-verified secureboot, database migrations, and adding new UI features.

Google

SOFTWARE ENGINEERING INTERN

Mountain View, CA

June 2016 - Aug 2016

- Worked with the GCam group (part of Google Brain) to develop firmware and DSP algorithms for precise 3D localization system.
- Wrote performance-critical code to process high-speed (~10MHz) data packets in real time on a Beaglebone Black with a PRUDAQ.

Projects

BlueQuilt

USC ROBOTICS EMBEDDED SYSTEMS LABORATORY

Los Angeles, CA

Aug 2019 - Current

- Developed a framework for orthomosaicing aerial imagery over water, a domain traditional SFM stitching algorithms struggle with.
- Floating April tags instrumented with GPS and IMU sensors are deployed in the water while a drone flies overhead.
- Factor-graph smoothing algorithm jointly estimates the pose of the drone and ground control points from GPS+IMU data of tags and drone.

TMAX

USC ROBOTICS EMBEDDED SYSTEMS LABORATORY

Los Angeles, CA

Jan 2019 - May 2019

- Extended the intrinsic motivation framework by Pathak et al. 2017 by adding a topological graph of landmarks to diversify environment exploration.
- Designed maze-like environments in a Doom PC port to reward exploration and developed diagnostic tools for measuring policy performance.

Baxter Plays Pent

INTRODUCTION TO ROBOTICS

Berkeley, CA

Aug 2016 - Dec 2016

- Team project to develop a system for a Baxter robot to play Pent against a human.
- Worked on systems integration in ROS. Linked together perception, AI, and motion planner modules and developed integration tests.

Publications

Chris Denniston*, **Aravind Kumaraguru***, and Gaurav S. Sukhatme. "Comparison of Path Planning Approaches for Harmful Algal Bloom Monitoring." OCEANS 2019 MTS/IEEE SEATTLE. IEEE, 2019.

Skills

Technical Skills	Machine Learning, State Estimation, Full-Stack Development, Firmware, Hardware Bringup
Languages	Python, C++, C, Ruby, Java
Software	Tensorflow, PyTorch, OpenCV, ROS, MuJoCo, Ruby on Rails, PostgreSQL Docker
Licenses	FAA Part 107 Remote Pilot License, Ham Radio Operator (Technician)