

Karthik Dharmarajan

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EDUCATION

University of California, Berkeley

Expected May 2023

Bachelor's of Science in Electrical Engineering and Computer Sciences

GPA: 3.96

Related Coursework: Efficient Algorithms and Intractable Problems, Data Structures, Optimization Models in Engineering, Intro to Robotics, Machine Structures, Structure and Interpretation of Computer Programs

TECHNICAL SKILLS

Programming: Java (4 years), Python (3 years), MATLAB (2 years), C++ (2 years), JavaScript (2 years)

Technologies: OpenCV (2 years), ROS (1 year), NodeJS (1 year), React/React-Native (1 year), MongoDB (1 year)

EXPERIENCE

Hybrid Systems Laboratory, Undergraduate Student Researcher July 2021 - Present

- Implemented core functionality for shadow prediction in Recon, a C++ based ground station that guides multiple drones for shadow-free field imaging
- Ported Pytorch trained LSTM network into C++ for cloud shadow prediction
- Integrated DARP (multi-agent area division algorithm) with an individual coverage path planning algorithm to create drone paths that cover an entire field

UC Berkeley | Lawrence Berkeley National Laboratory, Undergrad Software Researcher September 2020 - Present

- Created powerful abstractions on a server to interface and control multiple different drones with different virtual reality interfaces using roslibpy and websockets
- Extended project support for PX4 and ArduPilot based drones by creating a hexacopter simulation in Gazebo in conjunction with MAVROS
- Integrated custom drone software onto DJI M210's for beyond line of sight control using a VR interface and a server

UC Berkeley Department of Plant and Microbial Biology, Software Researcher February 2021 - May 2021

- Improved an automated plant imaging system that detects plant immune response to *Pseudomonas syringae*
- Programmed motor movement calibration by using onboard cameras and ArUco Markers

Boston University School of Medicine, Software Research Intern Jun 2019 – Aug 2019

- Used machine learning to detect the presence of *H. pylori* within images of a biopsy
- Filtered and segmented Whole Slide Images using color thresholding in order to efficiently preprocess the data for a ResNet-101 neural network

PROJECTS

Cornucopia - Grocery Expiration Notification App (Summer 2021)

- Cornucopia is a full stack React Native grocery expiration notification app on both iOS and Android
- Node.JS backend deployed using Docker and AWS ECS to AWS EC2 instances
- Backend utilizes AWS S3 for storing grocery images and MongoDB for general grocery data
- User authentication is handled via AWS Cognito

Gitlet (Spring 2021)

- A version control system similar to Git that allows staging, committing, and checking out of files using blobs
- Creating and merging branches are supported by using BFS to find the split point of two branches in its commit history