Karthik Dharmarajan

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EDUCATION

University of California, Berkeley **Expected May 2024**
Bachelor's of Science in Electrical Engineering and Computer Science
GPA: 3.96

Related Coursework: Data Structures, Structure and Interpretation of Computer Programs, Designing Information Devices and Systems I & II, Discrete Mathematics and Probability Theory

TECHNICAL SKILLS

Programming: Java (3 years), MATLAB (2 years), Python (2 years), C++ (1 year), Swift (1 year), JavaScript (1 year)
Technologies: OpenCV (2 years), ROS (1 year), Gazebo (1 year), NodeJS (0.5 years)

EXPERIENCE

UC Berkeley | Lawrence Berkeley National Laboratory, Undergrad Software Researcher **September 2020 - Present**
• Creating powerful abstractions on a server to interface and control multiple different drones with different virtual reality interfaces using roslibpy and websockets
• Extending project support for PX4 and ArduPilot based drones by creating a hexacopter simulation in Gazebo in conjunction with MAVROS
• Implementing a modular method of publishing topics and services from a local ROS network to a server

Underwater Robotics at Berkeley, Perception Software Lead **September 2020 - Present**
• Improving team's saliency detection algorithm by incorporating several approaches to maximize speed and accuracy
• Using computer vision algorithms in OpenCV, such as Otsu's binarization, color thresholding, and histogram equalization to detect multiple underwater artifacts in varying light conditions

UC Berkeley Department of Plant and Microbial Biology, Software Researcher **February 2021 - Present**
• Developed and 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
• Developed novel solutions to constraints in Whole Slide Imaging and image segmentation with implementations using MATLAB, Python, and TensorFlow
• Filtered and segmented Whole Slide Images using color thresholding in order to efficiently preprocess the data for a ResNet-101 neural network

PROJECTS

The Game of Complexity: When Runtime Analysis Goes Wrong (Spring 2021)
• Utilizes Java to create an immersive, randomized world consisting of hallways and rooms that contain power-ups and coins
• Depending on varying difficulty levels, enemies chase the main character through hallways using the A* algorithm
• Main character has toggled line-of-sight world rendering
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