

Curtis Muntz

ROBOTICS ENGINEER

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Robotics/Systems/Build generalist software engineer looking to apply my skills toward unique applications.

Summary

Robotics generalist with wide array of skillsets. I like to describe myself as a "full stack roboticist", as I've owned or worked on the entire robotic stack, from hardware integrations, writing linux drivers, managing yocto linux OS's, writing and tuning estimation and control algorithms, designing software deployment schemes, end to end system testing using motion capture, STIL simulations, setting up CI systems, data visualization, etc.

Qualifications

Experience in:

Converting legacy codebases into a Bazel build system. Creating metrics and data pipelines. Embedded systems and Yocto Linux. System integration and debugging using Robot Operating System (ROS) and similar distributed computing systems. C++ unit testing. Entire Nvidia Jetson product line. State estimation and sensor fusion using Kalman filters, including EKFs and UKFs. Computer vision algorithms using OpenCV and Matlab. Motion capture systems. Algorithm development and simulations using Matlab and Python. PID controllers and controller tuning experience. Data visualization using Python, Jupyter, Streamlit, and Houdini. Dev-ops technologies including Docker, Mesos, Marathon, Ansible, Terraform, and Kubernetes. Windows and Linux systems administration. Continuous Integration systems including Jenkins, Github Actions, DroneCI. API design using protobuf.

Programming and Misc. Languages:

C++, Python, Bash, Docker, Bazel/Starlark, Nix/NixOS, Git, Matlab/Octave, Ansible, Terraform/Tofu, Kubernetes, \LaTeX .

Selected Work Experience

280 Earth

SENIOR SOFTWARE ENGINEER

remote

December 2022 - Present

Developing software and infrastructure related to direct air carbon capture.

- Developed robust pipeline for aggregating PLC metrics into modern backends.
- Developed build system to solve for a factory as a configuration.
- Led build and release efforts
- Led infrastructure development projects

Google X

SENIOR SOFTWARE ENGINEER

remote

January 2021 - December 2022

Performed contract software engineer work for Google X via PRO Unlimited on a non-public team.

- Converted legacy embedded build system into bazel build, enabling deterministic embedded development.
- Developed custom yocto based embedded linux distribution shipping a real time linux kernel.
- Developed yocto layers to enable embedded linux over the air updates using systemd-repartd, systemd-updated.
- Adapted open source, open hardware motor controller with torque feedback sensor, enabling torque control for robotics applications.

Postmates-X (now Serve Robotics)

SOFTWARE ENGINEER

San Francisco, CA

July 2019 - January 2021

Developed software for last-mile delivery robot.

- Initially part of the Robotics team, but moved to Infrastructure team.
- Maintained CI / CD / Releases for a team of 50+ engineers and 20+ robots.
- Maintained Bazel build infrastructure for C++ / Python code base.
- Developed Bazel workflows for integration testing suites and embedded linux deployment including cross compilation workflows.
- Implemented tooling to aggregate device usage (CPU / memory / cgroup usage) into custom middleware.
- Implemented automated flashing utilities to enable contract manufacturers to fully provision robots without engineering assistance.

area17

Oakland, CA

ROBOTICS ENGINEER

May 2017 - July 2019

Developed tools and software for aerial and terrestrial robots capable of physical automation tasks within GPS denied environments.

- Converted a local CMake build system to a Bazel cross compile workflow, allowing for a massive increase in developer productivity.
- Managed software build and release onto devices.
- Managed flight operations and integration with the PX4 flight control software.
- Worked with stereo vision depth estimates and occupancy grid based planning methodologies to enable safe autonomous flight.
- Led drone hardware integration projects and supporting customers integrating area17 autonomy software onto their existing hardware platforms.
- Assisted in development of a gRPC API allowing third parties to interface our drones.
- Set up a motion capture system for use in QA testing and automated capturing of flight performance metrics.

PreNav

San Carlos, CA

ROBOTICS ENGINEER

May 2015 - May 2017

Specializing in state estimation, controls engineering, flight operations, systems integration, and dev-ops. Wrote and maintained code for autonomous drones, allowing for automated inspection of cell towers and wind turbines.

- Implemented a custom UKF estimation library for sensor fusion of local and global coordinate sensors, allowing for centimeter precision drone flight.
- Implemented a monocular visual odometry system.
- Set up a safety indoor flight cage using motion capture system for controller and estimator validation.
- Built tools for flight log analysis and analyzed flight data to determine root cause of field reports.
- Managed a Yocto Linux project for creating customized Linux installs for our embedded Linux systems.
- Set up and maintain a local compute cluster consisting of networked computers using Mesos, Marathon, ZFS, Docker, and Ansible technologies.
- Used this cluster to perform automated, full system offline integration tests. Tests utilized automated, procedural, environment generation allowing simulation of sensors and photo-realistic cameras. These inputs were used to simulate and test our full system on any number of use cases.

City of Roseville

Roseville, CA

SYSTEMS ADMINISTRATOR

2008 - 2015

Windows / Linux Sysadmin for a local government IT department.

- Managed servers on an on-premise datacenter

Education

CSU, Sacramento

Sacramento, CA

B.S. ELECTRONICS ENGINEERING, CONTROLS FOCUS

May 2015