# 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 oses, 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. 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 and Houdini. Dev-ops technologies including Docker, Mesos, Marathon, AWS, and Ansible. Windows and Linux systems administration. Continuous Integration systems.

**Programming and Misc. Languages:**
C++, Python, Bash, Docker, Bazel, Git, Matlab/Octave, Ansible, LaTeX.

## Selected Work Experience

### PRO Unlimited

*remote*

Software Engineer

*January 2021 - Present*

Performing contract software engineer role for Google.

- Expected project completion in April of 2021

### Postmates-X

*San Francisco, CA*

Software Engineer

*July 2019 - January 2021*

Developed software for last-mile delivery robot.

- Intially 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 copmilation 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*

Developing devloper 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.
- Manage software build and release onto devices.
- Manage flight operations and integration with the Pixhawk flight control software.
- Working with stereo vision depth estimates and occupancy grid based planning methodologies to enable safe autonomous flight.
- Leading drone hardware integration projects and supporting customers integrating area17 autonomy software onto their existing hardware platforms.
- Assisted 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 odometery 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*