

## Alexander Farley

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[asfarley.com](http://asfarley.com)

[Github/asfarley](https://github.com/asfarley)

## Skills

C, C++, C#, Ruby, Python, MATLAB  
State estimation and multi-object tracking  
Neural network design (PyTorch, Yolo)  
PCB layout and firmware design

FPGA development (Simulink, LabVIEW)  
Web development (Rails, Javascript)  
Internet-of-things (IoT) design  
Cellular and bluetooth device development

## Professional Experience

### Roadometry \_\_\_\_\_ Jan 2017 - Current

Position: Founder/Developer

Developed computer-vision software for road traffic surveying as a self-funded side project. Brought the project to market and made first sales in 2019. Homepage: [roadometry.com](http://roadometry.com)

Iterating on neural-network architecture using modern deep-learning packages. Integrating Yolo architecture with proprietary tracking networks. Building and maintaining in-house training set using custom tooling. Providing on-site support for live systems.

Management and planning of software development tasks. Issue triage and root-cause investigation. Cost estimation for new feature development. Market assessment to guide new feature development.

### Vital-Sim \_\_\_\_\_ June 2019 - Current

Position: Software Developer

Feature development for a desktop C++ Windows application. Conversion of application from MFC dialog-based form to MFC multiple-document interface (MDI) architecture.

Development of next-generation application using C# and XAML. Compiler development using Bison and Flex tools.

Engaging with users to plan new feature development. Logging user-reported issues in issue-tracking system. Formalized software requirements and testing strategy.

Performed detailed root-cause analysis for performance issues.

Setup and maintenance of development tools including local git server.

### Tangent Design Engineering \_\_\_\_\_ Aug 2018 - April 2020

Position: Firmware Lead

Mentored new employees on technical topics including version control (Git) and good testing practices.

Defined and implemented software architecture for Internet-of-Things projects; developed C drivers now used company-wide on several projects; selected an external IoT platform which has been used successfully on several projects.

Participated in early-stage planning of features and design criteria for new products. Interacted directly with clients to discuss technical requirements and market needs.

Advocated for modern engineering practices in requirements documentation. Deployed and maintained internal issue-tracking server. Introduced employees to good issue-tracking practices.

**Tangent Design Engineering** \_\_\_\_\_ Feb 2017 - Aug 2018

Position: Firmware Developer

Firmware development in C on ARM Cortex microcontroller. Board bring-up, submodule debugging and integration. Development and tuning of PID controls, sensor calibration mappings, BLDC, stepper motor and valve control, Bluetooth communications, logging, and remote control and other peripheral system functions.

Integrated precision sensor system with internet-of-things (IoT) data collection platform. Developed visualizations using HTML and javascript for live measurement streams/timeseries.

Analyzed firmware performance using system logs to characterize parameters like control-loop response time and stability, and sensor drift due to environmental conditions.

Was responsible as the sole developer for issue management, diagnosis and debugging of system software including firmware, edge data transmission and central aggregation/display. Cooperated with project engineers to verify, demonstrate and improve system capabilities including accuracy and cost.

Developed firmware for a (United States) Class II medical device. Designed and used test jig for verification of system performance and dual-fault-redundant safety functionality. Contributed to electrical and mechanical design in order to improve overall device performance and effectiveness of safety functionality.

**Frobot** \_\_\_\_\_ Aug 2016 - Feb 2017

Position: Lead Developer

Developed soft-serve/frozen yogurt vending machine system architecture including serving automation, payment processing and remote management functionality.

Design, development and debugging of linear actuator and load cell control electronics. Managed manufacturing runs of small PCB quantities in Shenzhen. Integrated system management software with electromechanical sub-modules, payment-processing gateway and HTML UI.

Developed centralized management server and associated responsive/mobile app for remote kiosk system configuration and status monitoring.

Contributed to business decisions on feature-set, prioritization and work estimates.

**ProLucid Technologies** \_\_\_\_\_ Jan 2015 - Jul 2016

Position: System Integrator

Developed FPGA components in LabVIEW for ultrasonic/electromagnetic non-destructive examination (NDE) equipment. Implemented sensory input and signal conditioning routines. Provided on-site debugging support for system testing. Developed closed-loop motor controls, sensor calibration procedures and other subsystems.

Developed closed-loop control for microfluidic sample flow. Developed Linux device driver for linear actuator control. Diagnosed and fixed issues in multiple-object tracking system. Improved system stability by implementing corrections for nonlinear regions in system model. Developed tooling to aid in system diagnostics (live GigE video sniffing application).

**Aversan** \_\_\_\_\_ Jan 2012 - Jan 2015

Position: Embedded Systems/Test Engineer

DO-178B systems testing. Requirements analysis and automated test development. Root cause analysis and fix verification. Integration lab maintenance. Some experience with Serena Dimensions configuration management.

Developed automated tests for ADCs, linear actuator and temperature feedback controls, fault response and reconfiguration, communications protocols, memory, system configuration, signal conditioning and related components. Maintained test execution tooling scripts in Python.

**Contract work** \_\_\_\_\_ Aug 2010 - Jan 2015

Industrial machine vision & control system development for Daqota Systems. Experience with Visual Studio 2010, Teledyne Dalsa computer vision libraries, soft real-time blob detection, image segmentation and classification.

Linear actuator PID control firmware programming (C, AVR Studio 5) & PCB layout (Eagle V5) for Precision Microdrives. Designed test jig circuit schematic and firmware. Laid out PCB, assembled prototype, initial PCB bring-up.

Developed AES-encrypted bootloader port (C, assembly, AVR Studio 5) for Dragon Link Labs.

Developed image-based cell counting/hemocytometry script in MATLAB.

**SKF Magnetic Bearings** \_\_\_\_\_ May 2008 - Sept 2009

Position: Electrical Engineering Intern

PCB layout for analog oscillator source board. C# Windows GUI programming, analog/digital hardware troubleshooting. Neutron chopper system diagram illustrations. BOM maintenance. Automated PCB testing.

## Education

University of Calgary \_\_\_\_\_ Sept 2005 - May 2010

BSc Electrical Engineering