Tyler **Weaver**

Software Engineer · Signal Processing · Embedded Firmware

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Summary

Highly motivated software engineer with experience leading long-term software projects involving optimizing algorithms for wireless communication. Embedded electronics hobbyist who enjoys using software and hardware to automate and solve problems. Interested in working on a team creating meaningful products.

Skills

Programming C/C++, Python, Matlab, JavaScript, Perl, Groovy, Processing, Java

Tools GCC, GDB, Make, Valgrind, SublimeText, Git, SVN, GPG, Bash

Embedded Arduino, RPi, Mbed, ARM, SPI, I2C, GPS, CV, IMU

Work Experience

LGS Innovations

Westminster, CO

Software Engineer III

Jun. 2014 - PRESENT

- Optimized C++ polyphase resampler and fir filter to run on ARM with NEON instructions
  - Filter design using same method as fir2 using fftw
  - Generic resampling implementation for arbitrary upsample and downsample rates
  - Used compiler optimizer output and knowledge of architecture to structure data and loop to take advantage of vectorization
  - Resulting fir filter and resampler used less instructions than intel IPP implementation and ran only 8x slower on A53 than on an i7 using intel optimized vector routines
  - Optimizing for vectorization resulted in 10x speed up over simple for loops
- Interface library for new SDR using protobuf messaging and VRT over Ethernet
  - Protobuf messaging with thread for asynchronous status updating
  - VRT over UDP for receiving sample data over a 10Ge link
- Adversarial Research on 802.11b Physical Layer using an SDR
  - Prototype C++ code using USRP to test RTS/CTS ranging technique
  - Developed unique method to improve ranging measurements based on observed behavior of AP messaging
  - Debugging using Wireshark to observe call and response
- Created library for detecing oddly configured cellular basestations
- P25 scanner library
  - Prototyped in python, Implemented in C++
  - FFT narrow band energy window detect for fast scanning
  - FSW search used for timing and frequency offset correction
  - Viterbi, Reed-Solomon, BCH, and CRC Decoding
  - Framing and Message Parsing for all Broadcast messages
- Radio interface libraries for scanner application
  - Epiq Sidekiq with Placekiq GPS
  - Ettus USRP N210 and B210 with support for hotplugging
- MPT1327 scanner library
  - Prototyped in matlab, Implemented in C++
  - Goertzel based fast reject for fast scanning
  - IPP Parallelized FM demodulator
  - Feedback timing recovery algorithm for MSK
  - CRC checker and Bit/Message parsing
- Ported matlab library for unknown signal analysis into C++
  - Arbitrary PSK and FSK input signal characterization
  - Implemented algorithms in C++ based off matlab code written by PhD

TecStar Consulting

Broomfield, CO

Software Engineer

Mar. 2014 - Jun. 2014

- Selenium automation testing of websites with Python and Java
- Android app development for Rachio sprinkler controller

Colorado Army National Guard

5/19th SFGA

Satellite Communications Systems Operator/Maintainer (25S)

Oct. 2008 - Oct. 2016

- Deployed in support of Special Operations Task Force East in Afghanistan (2013)
- Developed software to automate extracting and converting geo locations from Google Earth files

Education

DeVry University

Westminster, CO

B.S. in Computer Engineering Technology

Aug. 2010 - Mar. 2014

- 3.96 GPA
- Weather balloon payload navigation project
- Tutor for engineering program students

Extracurricular Activity

Embedded Electronics

Lakewood, CO

Rally Build Endurance Race Team

Dec. 2018

- Microcontroller CAN bus communication
- Power control circuits for motor control and high side switching
- Sensor signal conditioning circuits
- Current measuring using Opamp

Automation for Airbnb using Smartthings controller

Englewood, CO

Fork of open source door lock smart app

Aug. 2017

- iCal parser and event logic for setting lock codes for each guest based on phone number
- Push notifications to phone app when guest uses their code for the first time

Co-driver computer for race car

Englewood, CO

Weavering Rally Team

Jul. 2017

- Embedded system for assisting co-driver during competition
- GPS tracking and timing on Arduino microcontroller with 7-segment display
- Competed in Rally Colorado 2017

Software for identifying ideal rental properties

Englewood, CO

Automated Investment Advisor

Mar. 2017 - Jun. 2017

- Scrapy scrapers for Realtor to find new listings
- Automated AWS EC2 Proxy instances for defeating Realtor.com tracking of bots
- MongoDb database for storing listings for analysis
- Airbnb scraper for finding similar properties listed for short term rental
- Daily PDF report generated using latex
- Developed locally and then deployed onto AWS
- Attempted to sell reports to Realtors

Colorado Robot Challenge

Golden, CO

Computer Vision on Embedded Hardware

Oct. 2013 - Mar. 2014

- Real-time firmware for 3d stereo vision sensor on XMOS and Nvidia hardware
- Custom BCB prototyping with surface mount components

splintermail.com

Westminster, CO

Install scripts and testing

Oct. 2017

- MacOS install script
- Beta testing