

# Raemond Bergstrom-Wood

raemond.com

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## EDUCATION

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### University of California, Berkeley

*Bachelors of Science, Electrical Engineering and Computer Science*

Berkeley, CA

May 2014

## EXPERIENCE

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### Essential Products

*Software Engineer*

Palo Alto, CA

November 2017 - October 2018

#### o **Firmware:**

- \* Developed FreeRTOS based app and diag application
- \* Wrote sensor, wireless, and hardware interface libraries
- \* Designed and implemented ultrasonic sensor algorithms & filtering
- \* Brought up and developed the signal processing algorithms for 24GHz Radar based Human presence detection
- \* Worked with chip vendors through SOW/MSA to develop custom chip firmware

#### o **Hardware:**

- \* Responsible for part selection and block diagrams
- \* Schematics and layout reviews
- \* Prototyping product hardware

#### o **Product Management:**

- \* Worked to create a home accessory road map
- \* Worked through multiple design iterations with ID
- \* Worked with a third party contractor to get through a POC electrical (schematics/layout) and PD (mechanical) design.

### Arete Labs, a stealth Home IOT Company

*Co-Founder and only Software Engineer*

San Francisco, CA

August 2016 - November 2017

#### o **Firmware:**

- \* Developed FreeRTOS based app and diag application
- \* Wrote sensor, wireless, service connection and hardware interface libraries
- \* Designed and implemented sensor fusion & filtering
- \* WiFi Soft AP based pairing

#### o **Service:**

- \* Firebase based service with functions deployed for various features. Examples include home state set based on phone location state changes.
- \* Integration with Amazon Alexa
- \* Push notifications

#### o **App:**

- \* Developed and Designed a feature complete iOS app developed in Swift.
- \* Device/Service in app pairing/provisioning
- \* Push notifications

#### o Industrial design, UI, UX ideation and feedback

#### o Logo & website design

#### o Maintained system block diagram and reviewed all schematics & layouts

#### o LT SPICE 120VAC Circuit Modeling & Analog Design

#### o Provisional Patents Co-inventor

### Nest Labs/Google

*RF Hardware & Software Engineer*

Palo Alto, CA

June 2014 - August 2016

#### o **Nest Guard & Sense:** RF Hardware Lead

- \* LTE, WCDMA, GSM, WiFi, BLE, Thread (802.15.4) integration
- \* Debugged and found manufacturable solutions for desensed radios (and sensors)
- \* Impedance matching filters, FEMS, LNAs, PAs

- ★ Schematic and Layout Reviews
- ★ Drove CM and In-house Validation
- ★ Factory Dry Runs and support
- ★ FCC, UL Certification Pretesting and Preparation
- ★ Patent filed
- **Nest Factory Test System:**
  - ★ Created Nest's first RF test automation systems (ATS). This evolved into the creation of a Nest test framework used throughout all factory test stations
  - ★ Brought git, jira, regression testing, and other skills to the team to enable team work and quicker execution
- **Hosted Validation Data Visualization Tool:**
  - ★ Built an internal website to host and plot RF validation data (Python, Flask, GAE)
  - ★ Trained fellow RF team members to contribute to/expand the site
- Supported numerous projects in development, debugging RF circuits and modules, interacting directly with CMs, embedded platform and communication software teams
- Interviewed all new team members for RF Hardware Design Group and the Factory Software Team
- Experience with UL, FCC, ETSI, BT Sig Certification Testing

## • Nest Labs

Hardware Engineering Intern

Palo Alto, CA  
May 2013 - June 2014

- **Nest Protect:**
  - ★ Led validation of the Nest Protect alarm propagation over 15.4 in a crowded 2.4GHz environment
  - ★ Wrote python tool to automate all RF validation testing from the physical layer (integrating everything from RS232 power supplies, vector signal analyzers and spectrum analyzers) to networking applications

## • nReduce, online startup incubator

Intern

San Francisco, CA  
June 2012 - September 2012

- **Miscellaneous:** nReduce was a online startup incubator, that unlike YCombinator, any company could join. It hosted weekly project check-ins and allowed members of the startup community worldwide give feedback and advice to each other
  - ★ Scraped publicly available lists of investors and found creative means to find contact information
  - ★ Ended up with a very well attended and well covered Demo day with articles from PandoDaily, VentureBeat, etc.

## RECENT PROJECTS

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- **Patient Control Epidural Analgesia Monitor:** Worked with the Stanford Medical School Anesthesiology Department to develop a product to help doctors track pain levels and the regularity of pain medication requests
  - Co-designed the hardware to have a potentiometer based pain level meter and a pressure sensitive resistor to catch button presses
  - Developed a FreeRTOS based firmware to push button presses and pain level changes to Firebase
  - Developed an iOS app (Swift) to plot current pain levels and pain medication requests
  - Created a simple service that would send push notification to doctors upon pain levels reaching a customizable level and an abnormal number of medication requests
- **Model Self Driving Car:** starting with the donkey base car and code
  - Modified the stock car to add an arduino to utilize the car's RF controller (Reading PWM and writing to the motor driver) to allow for more natural training data collection
  - Added an ultrasonic transceiver to avoid collisions
  - Implemented some OpenCV filtering to images before training and modelling to make driving more directly based on the road lines
- **Machine Learning Fog Detection Model:**
  - Wrote small script to download all SF traffic camera images from KRON & NBC every 15 minutes for several months
  - Built a Keras/Tensorflow based convolutional neural network to detect whether there is fog on the Golden Gate Bridge
  - Working on implementing small api so Amazon Alexa can query it

## SOFTWARE SKILLS

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- **Languages:** Swift, Python, Objective-C, C, C++, Javascript, SQL, Java
- **Technologies:** Git, Flask, GAE, Firebase, Firebase Cloud Notifications, AWS, GCP, React, Testflight
- **Platforms:** iOS, Mac, Linux, Arduino & Raspberry Pi, ESP8266 & ESP32, STM32
- **Hardware Interfaces:** Serial, I2C, SPI, UART, RS232, GPIB
- **Tools:** Vim, Eclipse, XCode, Keil uVision

## HARDWARE SKILLS

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- **Equipment:** Spectrum Analyzer, Vector Network Analyzer, Oscilloscope, Multimeter, Logic Analyzer, Function Generator, R&S CMW500, Litepoint IQ201X & IQXeI
- **RF Protocols:** WiFi 2.4GHz & 5GHz, BLE, 15.4 (Thread), LTE, WCDMA, GSM, NFC
- **Software:** LT SPICE, ADS, Allegro, Altium, basic Fusion360
- **Skills:** Soldering parts as small as 01005