Raemond Bergstrom-Wood

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Education

- **University of California, Berkeley** — Berkeley, CA
  Bachelors of Science, Electrical Engineering and Computer Science — *May 2014*

Experience

- **Essential Products** — Palo Alto, CA
  Software Engineer — *November 2017 - October 2018*
  - **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
    - CM bring-up and test station bringup
  - **Hardware**:
    - Responsible for part selection and block diagrams
    - Schematics and layout reviews
    - Prototyping product hardware
    - CM Selection and bring-up
  - **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** — San Francisco, CA
  Co-Founder and only Software Engineer — *August 2016 - November 2017*
  - **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
  - **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
  - **App**:
    - Developed and Designed a feature complete iOS app developed in Swift.
    - Device/Service in app pairing/provisioning
    - Push notifications
  - Industrial design, UI, UX ideation and feedback
  - Logo & website design
  - Maintained system block diagram and reviewed all schematics & layouts
  - LT SPICE 120VAC Circuit Modeling & Analog Design
  - Provisional Patents Co-inventor
- **Nest Labs/Google** — Palo Alto, CA
  RF Hardware & Software Engineer — *June 2014 - August 2016*
  - **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** Palo Alto, CA
  Hardware Engineering Intern *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** San Francisco, CA
  Intern *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

- **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

- **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

- **Equipment**: Spectrum Analyzer, Vector Network Analyzer, Oscilloscope, Multimeter, Logic Analyzer, Function Generator, R&S CMW500, Litepoint IQ201X & IQXel
- **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