AMAN SEHGAL

FIRMWARE/EMBEDDED SOFTWARE ENGINEER/ELECTRICAL ENGINEER

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SUMMARY

Firmware Development and Design ● Electronic design and PCB design ● Electronic Bench Test and measurement equipment ● MATLAB/SIMULINK to design filters and control systems and prototyping algorithms ● Python and PHP(for remote access) for scripting and communicating with embedded devices ● Machine Learning with Python in SciKit Learn, TensorFlow, NumPy/SciPy, Theano ● Computer vision with MATLAB.

EMPLOYMENT

Blaise

Founder/CEO - October 2015 to present, Philadelphia, PA

- Feasibility and need finding study and market research.
- Designed proof of concept and UI/UX.
- Conceived the value proposition and performed hypotheses validation.
- Developed execution timelines and consolidated implementation costs.

Apple Inc.

Firmware Engineering Intern - May 2016 to August 2016, Cupertino, CA

- Full-Stack development of a SaaS tool that allows configuration of devices running embedded systems.
- Deployed a LAMP server on a MAC OS X system (MAMP).
- Developed backend in PHP & MySQL.
- Developed front-end in HTML5/CSS and JavaScript.
- Developed an Automated tester in PHP and C for on target Testing and deployment testing.

FARO Technologies

Firmware Engineer - Oct 2014 to Apr 2015 - Exton, PA

- Re-wrote and refactored C/C++ firmware for a LASER tracker designed for high precision micron granularity measurement.
    - Ported code to Xilinx ISE toolchain running arm-gcc compiler.
    - Restructured the driver layer using the strategy pattern.
    - Used the singleton pattern to re-implement an off-chip device bus master.
    - Created tasks, wrote startup code and implemented device-bus sharing using mutexes in freeRTOS.
- Developed an abstraction layer for freeRTOS in order to make future ports of the firmware OS agnostic.
- Led the firmware team's version control migration to GIT.
- Employed optimizations to free up code space that allowed new features to be added to the existing DSP firmware.
    - Used visual DSP++ toolchain and minimized size of benign code sections using compiler pragmas.
    - Added diagnostic features using bit fields to indicate if a certain warning/failure needed to be triggered.

Lutron Electronics Co. Inc.

Senior Project Embedded Engineer - Feb 2012 to Oct 2014 - Coopersburg, PA

- Developed Embedded software in C for a microcontroller based OEM embedded solutions at the PCB level using Oscilloscopes and Logic Analyzers to debug firmware.
    - Ported and adapted an existing bootloader to work on a 8 bit microcontroller.
    - Wrote device drivers for USART, DMA and Timer driven TDMA protocol.
    - Developed bench test, measurement and verification procedures for testing team.
- Designed and Developed features and implemented them in C for a wide power range LED driver.
    - Developed thermal foldback procedure.
    - Designed and developed over current protection using a sliding window averaging filter.
    - Made TDMA communication protocol immune to noise.
    - Reduced complexity of hardware design by utilizing direct A/D readings from feedback current source.

- Wrote all the necessary technical design and test/quality assurance documents describing the theory of operation of the product.
    - Develop bench tests and procedures.
    - Use formal modelling methods (UML, Flow Charts) to create design docs.
- Led the effort to obtain the DALI international standards certification.
    - Performed TDD and developed features to support the DALI 1.0 protocol extensions for LED driver.
    - Created necessary testing procedures and design documents describing theory of operation.
- Led the effort to develop and deploy a Continuous Integration using the Jenkins framework that performed automated daily builds and testing immediately prior to a release build.
- Developed features in C++ for the Radio RA2® wireless home automation consumer product.
    - Designed and implemented Ethernet broadcast storm protection.
    - Added new device objects to support the GrafikT® dimmer and switch by Lutron®.
    - Added a new feature that would allow a wireless keypad key-press to toggle the movement of a wireless shade.
    - Fixed numerous bugs that led to a major release for the end user.

Comcast Cable
Systems Test Engineer - Jun 2011 to Feb 2012 - Downingtown, PA

- Developed QA tests and formal procedures for cloud based DVR service.
- Designed and deployed a VOD server with dummy streaming channels for the QA team.

CoVal Systems
Embedded Software Engineering Intern - May 2010 to Aug 2010 - Ardmore, PA

- Port the existing code to a new compiler and perform Quality Assurance based on existing test beds.
- Ran the in-house test suites to guarantee code quality and fixed most discovered bugs.

EDUCATION

University of Pennsylvania
M.Sc. Engineering - Robotics, 2018

University of Pennsylvania
M.Sc. Engineering - Embedded Systems, 2017

Villanova University
B.Sc. - Electrical & Computer Engineering, *Magna Cum Laude*, 2011

SKILLS

MACHINE LEARNING:
TENSORFLOW, SCIKIT-LEARN, KERAS, THEANO
NUMPY/SCIPY, WEKA

PROGRAMMING LANGUAGES:
C/C++ (including STL), Java, Python, MATLAB, PHP, JavaScript, VHDL

IDES:
Eclipse, NetBeans, IAR Workbench, Code Warrior, Visual DSP++, Code Composer, Xilinx SDK, Keil uVision, ARM DS, Eclipse PyDev

BUILD TOOLS:
CMake, Make, ANT

SOURCE CONTROL:
GIT, MKS Integrity

AGILE TOOLS:
Version One, Atlassian JIRA, HPQC

CONTINUOUS INTEGRATION TOOLS:
Jenkins, Atlassian Bamboo

TDD UNIT TESTING:
JUnit, CppUtest

PCB DESIGN:
Altium Designer, P-CAD, Eagle CAD

EMBEDDED PLATFORMS:
ST ARM M0/M3, NXP ARM M3, TI ARM M4, Xilinx ZYNQ, STM 8, ADI SHARC, Freescale iMX6, Motorola ColdFire

RTOS:
freeRTOS, Keil RTX-RL, uC/OS-II, pSOS+, Embedded Linux

DEBUGGING:
Oscilloscopes, DMMs, Function Generators, Standard JTAG ICEs/ICDs

DOCUMENT CONTROL:
Microsoft SharePoint

FORMAL VERIFICATION:
UPPAAL, PC-LINT, UML, PYLINT
MATLAB STATEFLOW

DATABASES:
MySQL, PHPMyAdmin