# **Zach Bernal**

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## **Summary**

I am a multi-disciplinary Computer Engineer able to easily transition up and down the technology stack to bring real-world solutions to hardware, firmware, and software projects.

## **Skills**

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| --- | --- | --- | --- |
| Firmware   * Embedded C * MIPS Assembly * Signal Processing * ThreadX RTOS | Software Polyglot   * C, C++, C#, Objective C * Java * Python * LabVIEW * PHP | Mobile   * iOS * Android | Devops   * Jenkins * Build and Release * Git * SVN |

## **Employment**

**VitalConnect, Inc., Campbell, CA Dec 2013 – Present**

**Firmware and Software Engineer -** VCI is a medical device startup developing a heartrate monitoring patch. I developed new features across embedded, iOS, Android, Linux and Windows platforms.

* Gained experience working with multiple tight-knit engineering teams in a dynamic startup environment
* Unified efforts across teams and projects, and gained a deep understanding of integration between firmware, software and mobile code
* Managed software releases for internal cross-team libraries
* Maintained firmware supporting sensors on our medical device, software for our embedded data relay, firmware for our internal test boards, and mobile applications on iOS and Android
* Converted our source code repositories from SVN to Git

**SuccessFactors, Inc. (SAP Cloud), South San Francsico, CA Jul – Nov 2013**

**Security Consultant -** SuccessFactors was a leader in BizX in the cloud, focused on security and compliance. I maintained network monitoring infrastructure and helped automate the creation of audit reports.

* Administrated the Tripwire 7.5 and 8.2 and RSA 6.1, 7.1 and 8.0 consoles
* Spearheaded the upgrade to Tripwire 8.2 and RSA 8.0
* Prepared audit-ready reports on our security infrastructure
* Handled penetration tests and remediation of discovered issues

**Zoran, Inc. (acquired by CSR), Sunnyvale, CA Mar – Jan 2013**

**Firmware Engineer -** Zoran was an industry leader in System-On-A-Chip silicon for digital cameras. Supported and enhanced legacy features for their embedded devices in a C/C++/ThreadX RTOS/MIPS Assembly environment.

* Refactored critical image processing hardware driver interfaces to improve code cleanliness and ease of access for applications developers. Proliferated the use of TDD in the development of new features.
* Integrated dual-sensor recording features and bug fixes from older customer branches to mainline to prevent duplication of efforts and to get projects in new markets to release on time
* Worked face-to-face with customer developers to solve critical release-blocking issues for a wide variety of overseas customers in Japan, Taiwan, China, and South Korea
* Developed high-level flow code, critical hardware driver interfaces, and added features to low-level ThreadX operating system calls

**Genomic Health, Inc., Redwood City, CA Jun – Aug 2007, Nov – Jan 2008, Jun – Aug 2008**

**Software Intern -** Genomic Health provides genomic-based cancer diagnostic testing to aid treatment of early-stage cancer. I maintained their website front end content and improved deployment of their business and lab tools.

* Upgraded an internal contract management application written in C# from .NET 1.1 to .NET 2.0, and modified its GUI to improve usability.
* Serviced maintenance requests for the website, www.genomichealth.com, including uploading and formatting new content, modifying the navigation interface, and formatting search keywords for interfacing with popular search engines.
* Built, released, and configured Genomic Health's suite of C# business and lab services on new development and QA environments, and documented the installation/upgrade process
* Maintained and released new content on the corporate website, including integrating flash into the front page
* Modified a C# email blaster utility that reads from a Microsoft CRM Database to create diagnostic logs.

**NASA Ames Undergraduate Student Research Program, Moffett Field, CA Jun – Aug 2006**

Software Intern – I interned with the IT department at NASA Ames as part of their undergraduate student research program.

* Evaluated and made recommendations on the Liferay web portal software for use on the NASA website
* Wrote & debugged C++ code & Javascript for enabling mobile devices to view board room availability schedules through web services.
* Wrote C++ software for synchronizing user network access information between an X500 directory and a system-generated spreadsheet.

## **Education**

**Computer Engineer, B.S. – University of California Santa Cruz Aug 2005 – Dec 2009**

Robotics & Control Track

Hands-on training in designing and building every aspect of embedded computing, from circuit design, processor architecture, PCB layout, robotic control, driver firmware, and signal processing.

## **Projects**

**SVN to Git Conversion Tool 2014**

[**https://github.com/Chrisknyfe/svn-to-git**](https://github.com/Chrisknyfe/svn-to-git)

VitalConnect, Inc. had two teams that needed to share a common C library to communicate between our biosensor and the phone-based data relay, but our team used SVN while the relay team used Git. I wrote a Python conversion tool to serialize the tangled network of SVN externals into distinct Git repos with chronologically accurate histories.

**UCSC Senior Project: Autonomous Beacon-Tracking Kayak 2008**

The National Marine Fisheries Service sought to better understand the migration patterns of rainbow and steelhead trout. My team and I built an autonomous kayak for tracking acoustic-beacon-tagged rainbow trout along the Sacramento River. My contributions to the project:

* Low-level Drivers for the Atmega128L Microcontroller
* Interfacing the microcontroller with a GPS chip, magnetometer, and DC motors
* PID Feedback control and behavioral programming
* Mechanical Design and Robot Assembly

**UCSC's Mechatronics Competition** **“The Tank!” Robot 2007**

I built an autonomous vehicle for competing in UCSC's Mechatronics class-wide competition. My team and I built a robot that tracked an IR beacon, drove around a field and was able to detect the boundaries of the playing field using IR reflectivity sensors, and deposit golf balls into a goal. “The Tank!” was prominently featured on the local news, KSBW (http://www.soe.ucsc.edu/classes/cmpe118/Winter09/, click on “final project description” and “KSBW news video.” “The Tank!” is the large robot with the black rubber wheels.)

**HC11 Waveform Generator & EEPROM burner 2006**

I designed and built an external-bus HC11 board for the UCSC Microcontroller Design course. I expanded upon the minimum specification by adding a digital-to-analog converter and writing software to play musical tones based on keyboard input. I exceeded the requirements of the class by modifying the hardware to write to the AM29F010 Flash chip and writing a suite of Linux-based software tools for programming the system in GCC.

**Remote Bukkit Minecraft Server Sep 2011 – Present**

I maintain a LAMP stack on Debian for a small minecraft community, set up iptables to mitigate DDOS/spam attacks, maintained a daily backup system, and maintained phpbb and MantisBT.

**Ad-Hoc Wireless Network for Mindstorms robots 2007**

I wrote embedded software for an ad-hoc wireless network between Lego Mindstorms robots for the UCSC Embedded Software course. Nodes were programmed to discover and cache routes, and re-establish routes when the network topology changed.