

## CAREER SUMMARY

- Accomplished embedded electrical engineering professional with a strong software background
- Experienced in printed circuit board design, embedded systems (hardware and firmware design), software development and system integration
- A demonstrated ability to quickly learn and apply new technologies and concepts, and easily adapt to change
- Naturally inquisitive, with strong debugging skills
- Strong interpersonal skills; excellent oral and written communication skills

## TECHNICAL SKILLS

|                                     |   |
|-------------------------------------|---|
| <b>Programming Languages</b>        | C/C++, Java, Javascript, NodeJS, HTML, CSS, PIC Assembly Language   |
| <b>Development Tools</b>            | Android Studio/IntelliJ IDEA, Xcode, Visual Studio Code, Git, SourceTree, Protel SE99, OmniGraffle, AutoCAD, VMWare Fusion                |
| <b>Methodologies</b>                | OOP, UI/UX, Source Code Version Control/Distributed Revision Control, Schematic Capture, PCB Layout                                       |
| <b>Operating Systems</b>            | Proficient: OSX, Windows; Familiar with: Linux  |
| <b>Platforms</b>                    | Desktop (OSX and Windows), web (HTML, CSS, JS, jQuery), mobile (Android), embedded systems (ARM Cortex-M4 and Microchip Technologies PIC) |
| <b>Communication Protocols</b>      | Bluetooth, WiFi, I <sup>2</sup> C, SPI, RS-232, RS-485  |
| <b>Hardware Design/ Debug Tools</b> | Agilent Mixed Signal Oscilloscope, Logic Analyzer, In-Circuit Emulator  |

## PROFESSIONAL EXPERIENCE

### Mar 2016 – Present **Freelance Engineer, Eugene, OR**

- Developed a wood stove temperature controller, based on an ARM Cortex-M4 microcontroller and written in C++. The hardware consists of a stepper motor, a small blower, two thermocouples, a home sensor and a potentiometer.
- Stepper and blower control systems both have manual and automatic modes.
- Integrated and modified 3 existing libraries to add the following functionality: thermocouple interface (SPI), serial command parser and motor controller (stepper and brushless DC) (I2C).
- Created a desktop GUI app to serve as an interface for the controller, allowing the user to monitor and control it. The app is based on Electron, a NodeJS based framework, using HTML, CSS, JS and node modules (including C++ modules). The app communicates with the controller via USB.
- Maintaining ZLS gravity meter Android app

### Oct 2014 – Feb, 2016 **Freelance Engineer, Petaluma, CA**

- Developed the embedded electronics and firmware for an LED sculpture with numerous light patterns, including sound responsive (using FFT), utilizing C++ on an ARM Cortex-M4 microcontroller
- Additionally, created an Android (Java) application designed to control the sculpture via Bluetooth
- Employed git for both the firmware and Android code, including online repositories
- Designed and fabricated a PCB to integrate the electronic components
- Designed an aluminum core PCB for high powered lighting LEDs
- Maintaining ZLS gravity meter Android (Java) app

### Aug 2009 – Sept 2014 **ZLS Corporation, Austin, TX/Petaluma, CA**

#### *Electrical Engineer and Software Developer*

- Developed an Android application used to control the company's portable land-based gravity meter, based on a Palm OS application
- Worked with internal users to create a more efficient UI design and add time-saving calibration features
- Developed wireframes and managed software development team
- Conducted testing and debugging

- Designed and modified cables and/or laid out PCBs for both land-based and air/sea gravity meters to accommodate new features, ease assembly and minimize complexity
- Managed the build of all land-based gravity meter PCBs and cables, including parts selection and procurement, and communicating with outside vendors

**April 2004 – Aug 2009                      Freelance Electrical Engineer, Austin, TX**

- Designed printed circuit boards for semiconductor-handling equipment, including component selection, schematic capture and PCB layout
- Designed system cable assemblies and supervised production of first articles with outside cable manufacturer

**Jan 2001 – April 2009                      Metal and Glass Artist, Austin, TX**

- Designed and fabricated metal and glass functional and decorative custom-made pieces; exhibited in numerous art shows
- Member of Balcones Forge Blacksmiths of Central Texas; participated in public demonstrations of traditional blacksmithing techniques
- Extensive training in metal art production at Austin Community College and glass art production at Corning Museum of Glass

**March 1991 – April 2000                      Progressive System Technologies/Asyst, Austin, TX**

***Electrical Engineer***

- Designed electronic hardware and firmware to control numerous pieces of semiconductor-handling equipment
- Hardware design included circuit design, component selection, schematic capture and PCB layout, and test and debug of discrete circuits and embedded PIC microcontroller-based systems
- Experience driving several types of motors and solenoids, and reading different types of sensors
- Firmware design included logic design, code generation, and test and debug, including in-circuit emulation, for PIC and Z-World microcontroller-based systems
- Developed numerous drivers in assembly and C
- Communication protocols worked with include RS-232, RS-485 and I<sup>2</sup>C
- Wrote system communication specifications, system user documentation and maintenance procedures

**Feb 1990 – Jan 1991                      Computer Algorithm Development, Austin, TX**

***Software Engineer***

- Integrated several software components of a custom machine vision system with a commercial robot
- Designed, wrote and debugged utility applications
- Documented vision system software

**Sept 1988 – Dec 1989                      Freelance Motion Picture, Los Angeles, CA**

***Camera Assistant***

- Performed 1<sup>st</sup> and 2<sup>nd</sup> cameraman assist duties on several motion pictures

**Jan 1984 - Sept 1988                      National Security Agency, Ft. Meade, MD**

***Electrical Engineer***

- Security Clearance: TS/SCI (Inactive)
- Designed, built and debugged digital and microprocessor-based systems
- Designed, wrote and debugged firmware

**PROFESSIONAL DEVELOPMENT**

**Sep 2016 - Dec 2017                      Lynda.com (MOOC Platform)**

- Numerous courses covering HTML5, CSS3, Javascript (including ES6), NodeJS, MongoDB and Git

**EDUCATION**

- **BS, Electrical Engineering**, North Carolina State University, Raleigh, NC, 1983
  - *Senior Design Project*: Designed a pulse width modulated motor speed control system

**INTERESTS & HOBBIES**

- Dance/Movement, consciousness, motion capture, immersive and responsive experiences, generative art, data visualization, permaculture, photography, FAA Certified Private Pilot (with IFR)