STEPHEN R. BENNETT

(612) 360-1129 • Stephen.Bennett@Colorado.edu
2865 Springdale Ln. · Boulder, CO 80303

OBJECTIVE

Seeking a full-time position upon completion of Master of Science degree in May 2014.

EDUCATION

University of Colorado at Boulder *August 2013 – Present*

- **M.S.** Electrical Engineering
- **Emphasis:** Power and Analog Electronics
- **GPA:** 4.000/4.000

University of Colorado at Boulder *Spring 2009 – May 2013*

- **B.S.** Electrical and Computer Engineering
- **Minor** Computer Science
- **Emphasis:** Communications
- **GPA:** 3.929/4.000
- **Dean's List** eight (8) consecutive semesters
- **ILR 3** Professional working proficiency French

SKILLS

Proficient in:

Python · C · MATLAB & Simulink · SPICE · C++ · Perl · Git · Oscilloscopes · Ply · Linux Multithreading · Android Java and XML · Design Patterns (GoF, GRASP) · Continuous Integration · Vim · Eclipse · Linux CLI · UML · In-Circuit Emulators · Altium Electronics Designer (Protel)

Familiarity with:

Compiler Construction · Orthogonal Array Testing · Switched Mode Power Converters · Bash Scripting · Assembly (IA32, ARM, MSP430) · HTML5 · Band gap Voltage References · Op-Amp Analysis and Design · Regular Expressions · OrCAD · Mathematica · Win32 CLI · Verilog HDL · LaTeX

WORK HISTORY

Qualcomm Inc. *May 2013 – August 2013*

Software Engineering Intern

- Developed log parsing system in Python from scratch in a pair programming environment with a Scrum workflow.
- Documented all code and requirements in UML and Sphinx.
- Elicited and tracked requirements from key stakeholders.
- Ensured code was well-tested and easily transferrable by employing test-driven development.
- Reviewed code using Gerrit and version controlled code using Git.

Qualcomm Inc. *May 2012 – August 2012*

Software Engineering Intern

- Wrote, tested, and debugged Perl scripts and modules to automate continuous integration testing of all codebase changes for the Femto Site Modem team.
- Developed continuous integration testing framework that interfaces with a Wiki and Testlink server so engineers can immediately identify regressions and other issues.
- Coordinated with team daily and extensively documented work and changes.
- Reviewed code using Gerrit and version controlled code using Git.

Blue Canyon Technologies *June 2011 – January 2012*

Engineering Intern

- Wrote, tested, and debugged C code for a National Instruments Data Acquisition Unit to interface with Simulink and reaction wheel rate sensors.
- Integrated C code with MATLAB & Simulink and assisted in development of control algorithms.
- Performed schematic capture and PCB layout using Altium Designer for form factored PCBs for final flight boards of "½U" CubeSat.

Colorado Space Grant Consortium *January 2011 – January 2012*

Electrical Power Systems Engineer

- Developed, built, tested, and debugged Battery Charging and Protection Circuitry for "3U" CubeSat that interfaced with a maximum power point tracker and 918 solar cell array.
- Performed schematic capture and PCB layout using Altium Designer for form factored PCBs for final flight boards.
- Verified and tracked requirements from key stakeholders.
- Programmed MSP-430 microcontroller to communicate with Command and Data Handling processor over SPI.
- Simulated power allocation logic (Separation Switch) in LTspice.
- Tested the satellite as part of the Reduced Gravity Education Flight Program at the Microgravity University in Houston, TX (JSC).

University of Colorado at Boulder *Fall 2010*

Tutor for C Programming

- Tutored C Programming Course that covered structs, linked lists, database management, and basic graphics implementation (Allegro).

PROJECTS

CU-Surrey Payload (CUSP) *Spring 2014*

Sponsor Dr. Scott Palo, Astronaut Joe Tanner, and SST-US

- Student designed payload to test low cost microelectronics in space.
- Scheduled to launch in 2015.
- ITAR restricted project.
- Tasked with programming microcontrollers, schematic capture, and PCB layout.

Solar Panel System *Spring 2014*

Under guidance of Prof. Dragan Maksimovic

- DC/DC takes in power from $85W$ photovoltaic panel ($15V - 22V$) and bucks voltage down to $11V - 13V$ to charge a lead-acid car battery.
- Battery voltage then boosted from $12V$ to $120V - 200V$ using cascaded boost converter to be used by follow-on $120VAC$ inverter.
- TI MSP430 microcontroller (programmed in C):
  - Monitors battery charging
  - Performs *Perturb and Observe* maximum power point tracking algorithm
  - Provides DC/DC buck converter and H-bridge inverter with gate drive signals using separate timer modules
- Analog compensator for double boost converter designed manually.
- All magnetics designed and wound by hand.

TeslaBox *Fall 2012 – Spring 2013*

Mentor Dr. Zoya Popović

- Software and Communications Lead on a senior capstone project consisting of a RF-shielded enclosure which uses radio waves to wirelessly charge a Li-Poly battery.
- Charge control and monitoring MSP430-based, makes use of SPI busses to wireless communication using TI CC1101 transceivers.
- Developed touch screen GUI to interactively view battery charging data and device status as well as send commands to the charging device inside the enclosure.
- All hardware (SEPIC board, power management boards, base station board) design in Altium Design for schematic capture and PCB layout.
- Proof-of-concept for wireless charging of consumer devices such as cell phones, toys, etc. using the far-field.

Python Compiler *Fall 2012*

Under guidance of Prof. Jeremy Siek

- Compiler written in Python to translate Python code to x86 and ARM assembly using ASTs and the visitor pattern.
- Supported Python semantics and was completed with support for:
  - (Nested) Classes
  - (Nested) Functions
  - (Nested) Control Flow (For, While, If-Then)
  - (Nested) Lists and Dictionaries
- Ported to compiling to ARM assembly once completed.
- The project was done using test-driven development in a pair programming environment.

EEG-Android Snapper+ *Spring 2012*

- Modified the source code for the AOSP camera app to support input from a rudimentary EEG monitor.
- EEG signals were taken from three copper tape electrodes placed on the user's forehead.
- ARM Cortex-M0 (programmed in C) performed two functions:
  - Sample Left/Center/Right EEG channels with ADC
  - Transmit sampled data over UART to a UART-Bluetooth module
- Android smartphone performed all other functions:
  - Receive Bluetooth data using a service
  - Modified camera app binds to Bluetooth service to receive EEG data
  - Translate received data into facial actions (smiling, blinking, scrunching forehead, etc.) which were then translated into a camera actions (zoom, focus, take picture)

NES Rover *Spring 2011*

- Arduino-based project which wirelessly controls a three-wheeled robot with a NES controller.
- D-pad controls direction, A and B buttons control speed.
- A set of six non-inverting amplifiers gave each controller input a specific output voltage which was then translated into a distinct PWM signal.
- After the wireless link, the PWM was low-pass filtered and interpreted by an Arduino, independently controlling left and right DC motors.

Android – Utility Belt *Fall 2010*

- Developed an Android application that possessed the following functionality:
  - Simple note taking (title, content)
  - Basic Google Maps integration with markers that tracked position over time
  - Tip calculator
  - Customizable color scheme

12-Hour Clock *Fall 2009*

- $5V$ powered, 12-hour clock designed using Altium Designer.
- Full design simulated and verified using Electronics Workbench prior to schematic capture and PCB layout.
- Final design employed only 7400 series ICs.
- Top honors received for most compact layout and highest overall functionality.

ECEN 5643	Software Engineering of Concurrent Systems
ECEN 5543	Software Engineering of Standalone Programs
ECEN 5523	Compiler Construction
ASEN 5018	Graduate Projects I
ECEN 4593	Computer Organization
ECEN 4113	UNIX Systems Administration
ECEN 3754	Operating Systems
ECEN 3350	Programming of Digital Systems
ECEN 3000	Digital Design Laboratory
ECEN 2703	Discrete Mathematics for Computer Engineers
ECEN 2350	Digital Logic
CSCI 2270	Data Structures

ECEN 5827	Analog Integrated Circuit Design
ECEN 5797	Introduction to Power Electronics
ECEN 5517	Power Electronics and Photovoltaic Lab
ECEN 5224	High Speed Digital Design
ECEN 5017	Power Electronics for Electric Drive Vehicles
ECEN 5002	Communication Lab
ECEN 4242	Communication Theory
ECEN 3400	Electromagnetic Fields and Waves
ECEN 3300	Linear Systems
ECEN 3250	Circuits and Electronics 3
ECEN 2020	Circuits as Systems 2
ECEN 2250	Introduction to Circuits and Electronics 1