

# Miranda Butler

## Contact

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## Skills

### Programming

- C++, Python, Java, MATLAB, LabVIEW, JavaScript, HTML/CSS, Qt

### Modeling

- Solidworks, AutoDesk Inventor, EES

### Other

- Eagle, Arduino, LaTeX, Machining, 3D Printing, Laser Cutter,

## Courses

- Computer Systems, Data Structures, Algorithms, Big Data
- CAD, System Dynamics, Component Design, Microsystems Integration, Circuits, Mechatronics

## Interests

Golfing, Bouldering, Swimming, Indoor Soccer, Skiing, Guitar, Yoga

## OBJECTIVE

To contribute to development and innovative design within the fields of robotics, system controls and automation using past experience and developed problem solving skills.

- Consistently work productively and efficiently to meet deadlines while placing safety and quality above all else.
- Natural ability to effectively interact in a group setting, demonstrated ability to organize, engineer, and generate results.

## EDUCATION

2011-2016 University of Colorado Boulder Boulder, CO

- B.S. Mechanical Engineering, Computer Science Minor
- GPA 3.56 out of 4.0
- Dean's List (Fall 2011, Spring 2012, Spring 2013, Spring 2016), Engineering Honors Program (graduated with honors), Engineering GoldShirt Program, EIT Certification

## ENGINEERING EXPERIENCE

2016-Present Medtronic Boulder, CO

### *Embedded Software Engineer*

- Contributed to development of electrosurgical generator designed to drive energy based medical devices intended for cutting and coagulating tissue
- Designed a network management system integrating clean object oriented programming (OOP) techniques to incorporate network protocols and connections, and data communication using publish-subscribe patterns via a Data Distribution Service
- Performed integration testing to ensure full functionality, and quality of the generator, validating error responses to corrupt data and broken components, and ensuring response time of energy delivery and GUI interactions don't exceed limits

2016 Mechatronics: Autonomous Robot Boulder, CO

### *Programming Lead*

- Designed an autonomous robot to collect and shoot ping pong balls through appropriate colored hoops, navigating via phototransistor sensors and a black/white tape sensor
- Developed code in C++ to control functionality of robot's wheels, motors and sensors using mbed microcontrollers
- Printed and designed PCB in Eagle to amplify phototransistor sensors and discern infrared emissions at varying frequencies

# Publications

April 2016

Characterization of Millimeter-wave 3D-printed Antennas For CubeSat Applications Using a Robotic Antenna Range (IEEE Antennas and Propagation Magazine)

October 2015

Electromagnetically Induced Transparency with Rydberg Atoms in Strong Microwave Fields (Physical Review Applied)

October 2015

MM-Wave Near-Field Measurements Using Coordinated Robotics (IEEE Transactions on Antennas and Propagation)

## 2015-2016 AMTL: In Vivo Disturbance Simulator

Boulder, CO

### *Systems Engineer*

- Prototyped, designed, manufactured and controlled disturbance table with 4 degrees of freedom to mimic patient breathing and shifting using stepper motors and an Arduino Mega microcontroller for linear actuation and control
- Acquired understanding of stepper motors and drivers to control motors at high speeds (pulsing 180 kHz), compensated for mid-band resonance and ramped up to peak speed by designing a custom acceleration curve
- Wrote code in Arduino to drive motors and designed and built PCB in Eagle for power distribution among all electrical components
- Developed team working skills by iterating through different communication methods, learning how to pitch ideas in a clear promotable manner

## 2012-2016 National Institute of Standards and Technology

Boulder, CO

### *Guest Researcher in Antenna Metrology Project*

- Designed and assembled quasi-optical scanning system used to visualize 200-500 GHz mmWave beam profiles. Wrote LabVIEW code to drive motor over a specified x-y grid and measure RF energy at each point on the grid. Analyzed data acquired to optimize the beam profile.
- Created 115 GHz scanning beam imager. Wrote code in LabVIEW for theta-phi driver and imaging process software.
- Constructed an automated system for power level reference using a known reference sensor to calibrate several mmWave sources then used to calibrate unknown bolometer.
- Developed an optical beam profiler system using a webcam and Gaussian fit model, and controlled through LabVIEW.

## 2015 Smart Alarm Clock

Boulder, CO

### *Student*

- Design and assembly of a Smart Alarm Clock that was controlled by pressure sensors and an Arduino
- Wrote code in Arduino for signaling to and from the alarm clock and interpretation of pressure sensors sequences of presses to turn off alarm clock

## SERVICE

### 2015 CU Bridges to Prosperity

Samaca, Bolivia

#### *Design Leader*

- Used AutoCAD to design a pedestrian footbridge in Bolivia
- Sourced materials and worked on construction of bridge

### 2013 Kids Around the World

Vincente Guerrero, Mexico

#### *Volunteer*

- Worked in a team to help construct three playgrounds in rural areas of Mexico and New Orleans