

# ROBERT RUDOLPH

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## EDUCATION

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**CARNEGIE MELLON UNIVERSITY** | Pittsburgh, PA  
B.S. in Electrical and Computer Engineering | May 2017 | GPA 3.7 / 4.0  
Minor in Robotics | Minor in Physical Computing

## EXPERIENCE

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**ELECTRICAL ENGINEER | OCULUS** | Menlo Park, CA | Summer 2016  
Designed custom production-line equipment for the next generation headset cable.  
Worked with high-speed signals, controlled impedance and length tuned differential pairs during layout and routing phases.  
Used a daughter-card modular design to swap out high-wear connectors while minimizing recurring expense.  
Worked with fab and assembly houses to manufacture my design at low volume.  
Developed firmware and a client-side PC application for use on the factory line.

**CREATIVE TECHNOLOGIST | DEELOCAL** | Pittsburgh, PA | Summer 2015  
Created brand experiences for Google, Dunkin Donuts, Netflix, and Nike, among others.  
Designed lighting control systems for two parade floats.  
Lead a small team of designers and engineers to create an interactive crowd control barricade for a concert series.

**PCB DESIGNER | IDENTIFIED TECHNOLOGIES** | Pittsburgh, PA | January 2015 - May 2016  
Designed circuit boards for industrial imagery drones and an automatic battery-swapping base station.  
Projects: high-current stepper motor driver, modular battery management system, GoPro controller, USB to serial adapter, quadcopter power system, spring-loaded battery pack interface, drone GPS and camera adapters  
Expanded in-house production techniques to meet higher volume requirements.

**ENERGETICS SYSTEM LEAD | FORMULA SAE TEAM** | 2014 - Present  
Lead development of the high voltage and low voltage electronics on an electric formula-style racecar, including a high-density battery pack, in-vehicle CAN network with nine custom boards, and oversaw design of the dashboard, wire harness, thermal management systems, vehicle firmware, and safety shutdown circuits.

**LEAD SOFTWARE ENGINEER | AMERICAN RAILWAYS** | East Hartford, CT | Summers 2012 - 2014  
Programmed and installed automated testing systems for New York City Transit on-site at the 207th street overhaul facility.  
Projects: brake valve tester, transformer tester, motor shell tester, vibration analysis and balancing system for HVAC units

**AVIONICS ENGINEER | CMU LUNAR XPRIZE TEAM** | Pittsburgh, PA | August 2013 - May 2014  
Designed and built a six-channel stepper motor controller and a 64-channel temperature sensing system for a lunar rover.  
PCBs were designed within the thermal, vacuum, and radiation constraints of space.  
Remotely piloted the prototype rover through a 500-meter endurance and terrain test to land a half-million dollar prize.

## PROJECTS

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**LIGHT INSTALLATION** - a three-story tall, sound-reactive lighting installation installed in the Hunt Library in Pittsburgh.  
**WIZARD CHESS** - a magical chess set, with pieces that move by themselves in response to spoken commands.  
**BATTLESHIP** - a working version of the classic Battleship board game, complete with fireballs, floating boats, and sound effects.  
**BEAT STREET** - a trio of full-body, wearable musical instruments that translate a dancer's movements into sound.  
**NEW FLAME** - a butane candle that ignites itself when you turn off the lights.  
**TELEPRESENCE ROBOT** - a compact, cheap telepresence robot, that works anywhere with cell service.  
**FIREFLY** - a standard-size lightbulb, with a twistable collar that adjusts color temperature from daylight to warm incandescent.  
**PAINTBALL SENTRY GUN** - a motion-tracking paintball turret. Designed and sold 200 custom controllers and two complete turrets to customers including the St. Louis Police Dept, the Royal Australian Navy, and RealWorld Tactical Training center.

## SKILLS

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**ELECTRICAL** | design and layout in Altium and Eagle, embedded systems, paste reflow and manufacturing, high-voltage work  
**MECHANICAL** | SolidWorks, mill, lathe, MIG welding, spot welding, automotive work  
**PROGRAMMING** | embedded C, python, Arduino, AVR assembly