

# Martin A. Cowell

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## OBJECTIVES

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- Mechanical engineer and electronics designer seeking a position that provides project ownership in renewable energy, and automated transportation.
- Proficient in sensor design specialized in ultra-low power management
- Comfortable in fast-paced interdisciplinary R&D environment, interfacing with engineers and product managers

## EDUCATION

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### UC Berkeley, Berkeley CA

- Ph.D. Mechanical Engineering

Expected May 2017

GPA: 3.9/4.0

### Colorado School of Mines, Golden CO

- B.S. Mechanical Engineering

May 2013

GPA: 3.9/4.0

## SKILLS

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- **Mechanical:** CAD, machine design, injection molding, basic machining including CNC, rapid prototyping including FDM and laser cutting, design for manufacturing and assembly, FEA
- **Electronics:** Eagle PCB design, ultra-low power management, bench top electronics prototyping, BLE communications (basic)
- **Programming:** MATLAB, Python, R, EES, LaTeX, Raspberry Pi incl. web server, Arduino
- **Software:** SolidWorks (Certified), Autodesk Inventor, Adobe Creative Suite

## EXPERIENCE

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### Graduate Researcher

### UC Berkeley

Fall 2013 – Present

#### Project Lead

#### Advanced Manufacturing for Energy Lab

- Led team of 5 researchers developing an energy harvesting sensor using printed electronics
- Designed and built ultra-low power management for wireless sensor. Expected 10+ year life via indoor-light harvesting
- Optimized formulation and manufacturing of lab's supercapacitors; improving capacitance 100x
- Reduced wireless sensor size by 55% via optimization modeling of energy harvesting dynamics

### Mechanical Engineer

### Persistent Efficiency

March 2015 – April 2016

- Early employee at IoT electric sub-metering startup: excelled in fast-paced research and manufacturing while considering scalability
- Designed injection molded enclosures for custom PCBs: features include live hinge, dual material, snap closure, "location fit" PCB retainer using overmolding, and undercut cams
- Built testing environment and designed test procedures to validate novel power-flow sensing

### Mechanical Engineer

### Undergraduate Capstone

August 2012 – May 2013

- Designed and built novel fuel gauge for zero gravity propellant tanks
- Leveraged finite element analysis to guide vibrational sensing system design
- 3rd place – Colorado School of Mines Engineering & Computer Science Trade Fair 2013

### Research Fellow

### Los Alamos National Labs

Summer 2012

- Built a sensory-substitution glove linking the wearer's brain to a distributed sensor network
- Prototyped wearable electronics for human subject testing

### Engineering Intern

### ABENGOA Solar

May 2011 – May 2012

- Mechanically tested composite aluminum honeycomb panels to validate their structural design for use in concentrated solar power plants
- Machined steel and aluminum fixtures to facilitate testing parabolic troughs

## **PUBLICATIONS**

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- Latimer, Evans, Cowell, Wright (2017) “Modeling of Interdigitated Electrodes and Supercapacitors with Porous Interdigitated Electrodes”. Journal of The Electrochemical Society
- Cowell et al. (2016) “Wireless sensor node demonstrating indoor-light energy harvesting and voltage-triggered duty cycling”. PowerMEMS
- Munsing, Cowell, Moura, Wright (2016) “Optimal component sizing in a two-reservoir passive energy harvesting system”. PowerMEMS
- Lechêne, Cowell et al. (2016) “Organic solar cells and fully printed super-capacitors optimized for indoor light energy harvesting”. Nano Energy
- Cowell et al. (2014) “Composite carbon-based ionic liquid supercapacitor for high-current micro devices”. Journal of Physics: Conference Series
- Mascareñas et al. (2014) “A Vibro-haptic Human Machine Interface for Structural Health Monitoring.” Structural Health Monitoring, Sage Journal.

## **STUDENT MENTORING**

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- Experimental design (printed electronics fabrication). Qian Zhang, Ian Lin 2014-16
- Mathematical modeling. Katherine Latimer, Karthik Gururangan 2015-17

## **PRESENTATIONS**

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- Printed Energy Harvesting for the Internet of Things. University of the Philippines. Jan 2016
- Energy Harvesting for Powering Devices in the Internet of Things. Intel Corp. April 2015
- Powering Devices in the Internet of Things. Berkeley Wireless Research Center. Jan 2015
- Expo and Demonstration: Fully Integrated, Printed, Self-Rechargeable Wireless Sensor Node for Engine and Motor Condition Monitoring. FlexTech Conference 2015
- Powering the Industrial Internet. Berkeley Mechanical Engineering Advisory Board. Oct 2014