

# 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
- Project lead and collaboration experience in fast-paced interdisciplinary R&D environment

## EDUCATION

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**University of California, Berkeley CA** Expected May 2017  
Ph.D. Mechanical Engineering (GPA: 3.9/4.0)

**Colorado School of Mines, Golden CO** May 2013  
B.S. Mechanical Engineering (GPA: 3.9/4.0)

## EXPERIENCE

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**Graduate Researcher & Project Lead** August 2013 – Present  
*Advanced Manufacturing for Energy Lab, UC Berkeley*

- Led team of 5 researchers developing an energy harvesting sensor built on 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** March 2015 – April 2016  
*Persistent Efficiency*

- 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

**Research Fellow** May 2012 – July 2012  
*Los Alamos National Labs*

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

**Engineering Intern** May 2011 – May 2012  
*ABENGOA Solar*

- 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

**Mechanical Engineer** August 2012 – May 2013  
*Undergraduate Capstone*

- 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

## 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 prototyping, BLE communications
- **Programming:** MATLAB, Python, R, EES, LaTeX, Raspberry Pi incl. web server, Arduino
- **Software:** SolidWorks (Certified), Autodesk Inventor, Adobe Creative Suite
- **Photography:** Trained photographer with associate degree

## 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 of 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