

Martin A. Cowell

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OBJECTIVES

- Engineer and hardware designer seeking a position that provides project ownership at the intersection of product design and the future of human transportation
- Proficient in sensor design specialized in ultra-low power management
- Project lead and collaboration experience in fast-paced interdisciplinary R&D environment

EDUCATION

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

Graduate Researcher & Project Lead August 2013 - Present
Advanced Manufacturing for Energy Lab, Berkeley CA

- 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, Berkeley CA

- Early employee at IoT electric sub-metering startup: excelled in fast-paced research while addressing scalable manufacturing
- 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 environments and designed test procedures to validate novel power-flow sensing

Research Fellow May 2012 - July 2012
Los Alamos National Labs, Los Alamos NM

- 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, Lakewood CO

- 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

- **Mechanical:** CAD, machine design, injection molding, basic machining including CNC, rapid prototyping, additive manufacturing and laser cutting, design for manufacturing DFM and assembly DFA, 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

- 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

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

PRESENTATIONS

- 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

COURSES

Outside of Mechanical Engineering at UC Berkeley

- Electrical Power Systems (3 phase power)
- Electromechanical Device Design (electric motor design)
- Energy Systems and Control
- Climate Change Mitigation
- Berkeley Lectures on Energy: Energy from Biomass
- Advanced Technical Communication