

Martin A. Cowell

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OBJECTIVE

- Hardware engineer seeking project ownership at the intersection of product design, embedded systems, and the future of transportation

EXPERIENCE

Propulsion Engineer, SpaceX, Hawthorne CA August 2017 – Present (2 yr)

- Designed, built, and delivered electromechanical valve assemblies for Merlin and Raptor rocket engines
- Blank-sheet designs reduced component size, cost, and takt by 4x, 5x, and 8x, respectively
- Qualified hardware for NASA human spaceflight, exceeding capability and reliability standards
- Carried component designs through full product lifecycle, culminating in ongoing and stable production

Graduate Researcher & Project Lead, AME Lab, Berkeley CA August 2013 – July 2017 (4 yr)

- Led team of 5 researchers to develop an ultra-low power energy-harvesting wireless sensor node
- Designed power management system that extended sensor life from 6 months to 10 years
- Optimized formulation and manufacturing of supercapacitors to improve energy storage by 100x
- Wrote Python optimization model of power generation to reduce sensor footprint by 55%

Mechanical Engineer, Persistent Efficiency, Berkeley CA March 2015 – April 2016 (1 yr 2 mo)

- Led validation campaign of the primary sensor product, a wireless consumer-scale power monitor
- Designed PCB enclosures to improve manufacturability and minimize electromagnetic interference
- Designed and built test environments to validate power prediction models of 3 phase AC power

Research Fellow, Los Alamos National Labs, Los Alamos NM May 2012 – July 2012 (3 mo)

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

Mechanical Engineering Intern, ABENGOA Solar, Lakewood CO May 2011 – May 2012 (1 yr)

- Mechanically tested composite aluminum honeycomb panels to validate structural designs
- Machined steel and aluminum fixtures and tooling to test parabolic solar concentrators

Mechanical Engineering Student, Undergraduate Capstone, Golden CO August 2012 – May 2013 (10 mo)

- Designed and built a novel fuel gauge for zero gravity propellant tanks, winning 3rd place in annual design competition
- Interrogated FEA and modal-analysis to guide vibrational sensing system design

SKILLS

Mechanical: Machine design, DFM, DFA, GD&T, injection molding, FEA

Electronics: Eagle PCB design, benchtop prototyping, oscilloscopes, function generators

Programming: MATLAB, Python, R, EES, LaTeX, Raspberry Pi, Arduino

Software: SolidWorks, NX, Fusion360

EDUCATION

University of California, Berkeley CA July 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)

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*