

Phillip Howard Daniel

Home: (857)247-6890

pdaniel@alum.mit.edu

Website: <https://pdaniel9.wixsite.com/precision/surface-grinder-analysis-and-build->

3 Ames Street
Cambridge MA, 02142

Education:

Massachusetts Institute of Technology (MIT) - Cambridge, MA

Candidate for Ph.D. in Mechanical Engineering

2021

Massachusetts Institute of Technology (MIT) - Cambridge, MA

M.S. in Mechanical Engineering

2015

- Relevant Coursework: Power Electronics, Analysis and Design of Feedback Control Systems, Mechatronics

Massachusetts Institute of Technology (MIT) - Cambridge, MA

B.S. in Mechanical Engineering, Concentration in Religious Studies

2013

- Relevant Coursework: Product Engineering Processes, Design and Manufacturing I & II, Introduction to Robotics

Fellowships and Awards:

- MIT Sloan Scholar
- Won \$10,000 InfyMakers award
- Awarded \$5,000 donation from Draper labs
- Accepted into Maxon Motor's *Young Engineers Program*
- Raised \$3,087 on Kickstarter.com
- Two time featured author on www.Instructables.com
- Moore Foundation MURF Fellow
- Gates Millennium Scholarship Program (GMSP) Fellowship Recipient
- GMSP Scholarship Recipient

Teaching Experience:

MIT Course - Analysis and Design of Feedback Control Systems – Cambridge, MA

Teaching Assistant

February 2015 – June 2015

- I co-led lab sessions three days per week, hosted office hours, proctored and graded examinations and reports, setup course demonstrations, lectured on the benefit of the L-minus Laplace transform for a special graduate lab session and coordinated with course graders.

Precision Motion Control Laboratory – Cambridge, MA

Undergraduate Research Adviser

November 2014 – May 2015

- I advised undergraduate mechanical engineering students in conducting research that is in line with the focus of my lab.

MIT Momentum – Cambridge, MA

Teaching Assistant

January 2012, January 2014, January 2015

- Mentored MIT undergraduates in an abbreviated design course. I taught inverse kinematics, mechanical design, CAD modeling, advanced fabrication, team management skills, presentation skills, and microcontroller electronics. In 2014 I helped design, build and host the course's first final competition.

Spokes – Cambridge, MA

Instructor

June 2013 – August 2013

- Raised \$3,087 in funding in an online fundraising campaign hosted by Kickstarter.com.
- Taught project based mechanical engineering concepts to four groups of high school and middle school students across the country, during a bike tour from San Francisco to Washington, DC.

MIT Education Studies Program – Cambridge, MA

Instructor

January 2013

- Raised \$5000 in funding from Draper labs and used part of the funds to develop a curriculum and project for teaching hands on learning to middle school students in the Cambridge area.

MIT Interphase – Cambridge, MA

Physics TA and Resident Advisor

June 2010 – August 2010

- Led recitation and office hours to teach Classical Mechanics to incoming freshman at MIT. I also served as a resident advisor to the students in their dormitory for both personal and academic matters.

Research Experience:

d'Arbeloff Laboratory for Information Systems and Technology - Cambridge, MA

Research Assistant

September 2017- Current

- Designing walking policies for supernumerary robotic limbs

Precision Motion Control Laboratory - Cambridge, MA

Research Assistant

September 2013- September 2015

- Designed and built a flexible hull undersea vehicle to study swimming efficiency.
- Submitted an M.S. thesis documenting the mechanical design and analysis of the system.

Biomimetic Robotics Laboratory - Cambridge, MA

Undergraduate Researcher

October 2011-December 2012

- Designed and fabricated a touch sensitive foot, using shape deposition manufacturing, which improved control by indicating contact with the ground.
- Designed and fabricated a mobile test stand for a quadruped robot's running tests.

NASA JPL - Los Angeles, CA

Moore Foundation MURF Fellow

June 2012- September 2012

- Designed and fabricated a mechanism capable of adhering to smooth, curved surfaces using a NASA designed nanostructure.

MIT-SOS-Lab – Cambridge, MA

Undergraduate Researcher

November 2011-September 2012

- Designed and fabricated a miniature heliostat as a tool to aid in illustrating the labs research.

Publications and Presentations:

- Daniel, Phillip, Asada, Harry, “Stable Walking Policy for Wearable SuperLimbs Attached to a Human with Tuned Impedance,” IEEE/RSJ International Conference on Intelligent Robots and Systems, 2020. Las Vegas, NV. 25-29 Oct 2020
- Daniel, Phillip, Church, Joseph, Trumper, David, “Actuation Schemes for Flexible Hull, Undersea Vehicles.” 29th American Society for Precision Engineering Annual Meeting. MIT Precision Motion Control Lab. The Westin Boston Waterfront, Boston. 11 November 2014. Poster Presentation.
- Daniel, P., Church, J., Trumper, D. (2014). “Series Elastic Actuation for Underwater Robot Locomotion.” *Proceedings of the 29th Annual Meeting*. Abstract accepted at 29th American Society for Precision Engineering Annual Meeting. The Westin Boston Waterfront, Boston. 11 November.
- Daniel, Phillip, Church, Joseph, Trumper, David, “Actuation Schemes for Flexible Hull, Undersea Vehicles.” NIWeek 2014. MIT Precision Motion Control Lab. Austin Convention Center, Austin. 20 July 2014. Poster Presentation.
- Daniel, P., Parness, A., "End Effector Design and Fabrication for Multi-Surface Adhesion," *California Institute of Technology Undergraduate Research Journal*, Winter 2013, vol. 13, number 1
- Parness, A., Hilgendorf, T., Daniel, P., Frost, M., Kennedy, B., "Controllable ON-OFF Adhesion for Earth Orbit Grappling Applications," *IEEE Aerospace Conference*, Big Sky, Montana, 2-9 March 2013
- Southern California Conferences for Undergraduate Research Presenter (SCCUR), “End Effector Design and Fabrication for Multi-Surface Adhesion,” November 2012
- Daniel, P., Slocum, A., “*The Design and Fabrication of a Passive and Continuously Repositionable Joint*,” Thesis. MIT, 2013. Cambridge: MIT, 2013. Print.

Related Professional Experience:

Markforged – Cambridge, MA

September 2015-September 2017

Senior Mechanical Engineer

- Designed and implemented a thermal test to identify a design flaw that lead to faulty hardware and would have delayed a product launch
- Designed and implemented an instrument to measure the real-time force on extruded plastic during a print. Instrument used to fine-tune printing parameters, validate filament material options, automate materials testing, and validate print-head nozzle geometry
- Designed and implemented fixtures to test and calibrate customer facing components
- Designed a part for injection molding and oversaw the production the mold
- Directed suppliers to produce machined and sheet metal parts based on my toleranced drawings and CAD data.

These parts were used for fixtures, mounting, and material handling assemblies both internally and in our product line.

EcoMaps – Cambridge, MA

November 2014-October 2016

Project Lead

- Leading an interdisciplinary team through the early stage growth of a consumer product company.
- Awarded a \$1,862.08 grant from the Council of the Arts at MIT in 2015.
- Awarded an \$800 grant from the MIT Graduate Student Council in 2016.
- Awarded a \$1,800 grant from the Council for the Arts at MIT in 2016.
- Awarded a \$1,000 grant from the MIT Sandbox Fund in 2016.
- Company accepted into MIT's Venture Mentoring Service and featured in the MIT Technology Review.
- Product advertised in a local retail store and has over \$1,000 in sales.

Design That Matters (DtM) – Salem, MA

Intern

February 2014-May 2014

- Worked on an interdisciplinary team of engineers, MBA students, and designers from MIT and the Rhode Island Institute of Design.
- Prototyped the electronic system for the first iteration of a pulse oximeter. This was soon after user tested in Vietnam by DtM.
- Our prototype was used to raise \$22,767 in an online fundraising campaign hosted by Indiegogo.com.

Jacobs Vehicle Systems (Danaher) - Bloomfield, CT

Design and Analysis Intern

June 2011-August 2011

- Produced and toleranced component drawings, verified vendor sketches, and designed tools and fixtures for material testing.
- Produced a 76% increase in efficiency for an automated, assembly machine.
- Conducted a finite element analysis of a production brake component and presented my results to the company's president and engineering team.

Skills:

Proficient: SolidWorks (CAD), Machining and Fabrication, Labview

Familiar: Pro Engineer (CAD), Mastercam (CAM), Math CAD, Arduino, Matlab, Spanish

References:

- Professor Harry Asada
 - Phone: (781) 572-5938
 - Email: asada@mit.edu
- Professor David L. Trumper (Professor of Mechanical Engineering)
 - Phone: (617) 253-3481
 - Email: trumper@mit.edu
- Professor Wesley L. Harris (Charles Stark Draper Professor of Aeronautics & Astronautics)
 - Phone: (617) 253-0911
 - Email: weslhar@mit.edu
- Noelle Wakefield (Assistant Director of Diversity Initiatives & MSRP)
 - Phone: 617-253-9462
 - Email: noellew@mit.edu