

# Maggie K. Delano

MEDICAL DEVICE DESIGNER · ASSISTANT PROFESSOR

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## Education

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### Massachusetts Institute of Technology

Cambridge, MA, USA

PHD IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCE WITH MINOR IN  
WOMEN'S AND GENDER STUDIES

Sept. 2012 - Jan. 2018

### Massachusetts Institute of Technology / Harvard Medical School

Cambridge, MA, USA

GRADUATE EDUCATION IN MEDICAL SCIENCES (GEMS) CERTIFICATE PROGRAM

Feb. 2013 - Dec. 2015

### Massachusetts Institute of Technology

Cambridge, MA, USA

MASTER'S OF ENGINEERING IN ELECTRICAL ENGINEERING AND COMPUTER  
SCIENCE

Aug. 2010 - June 2012

### Massachusetts Institute of Technology

Cambridge, MA, USA

BACHELOR OF SCIENCE IN ELECTRICAL SCIENCE AND ENGINEERING

Sept. 2006 - June 2010

## Experience

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### Swarthmore College

Swarthmore, PA, USA

ASSISTANT PROFESSOR OF ENGINEERING

January 2018 – Present

- Teach courses including Embedded Systems (S18, S19), Digital Systems and Computer Engineering Fundamentals (F18), Design of Digital and Embedded Systems (F18) and Computer Architecture (S19).
- Developing a wearable calf bioimpedance monitor for patients with Congestive Heart Failure.

### Sodini Medical Electronics Research Group

Cambridge, MA, USA

PHD THESIS PROJECT

Sept. 2012 – Jan. 2018

- Designed a portable bioimpedance system to help reduce heart failure re-admission rates.
- Performed clinical testing in healthy participants (MIT) and hemodialysis patients (MGH).

### Fitbit

San Francisco, CA, USA

RESEARCH INTERN

June 2012 – August 2012

- Lead Prototype Electrical Engineer on the Fitbit Surge.
- Designed second generation PCB, including board level design, layout, and firmware (MSP430).
- Characterized system and made preliminary measurements in humans.

### Sodini Medical Electronics Research Group

Cambridge, MA, USA

MENG THESIS PROJECT

Jan. 2010 – June 2012

- Designed a wearable cardiac monitor based around an MSP430 microcontroller.
- Records electrocardiogram and 3-axis acceleration data continuously for up to one week.
- Validated cardiac monitor in the Clinical Research Center at MIT.
- Performed as well or better than a commercial monitor, especially during running.

- Developed and tested theories to characterize pacemaker lead heating in MRI.
- Wrote final report that became the basis for an FDA approval application.

## Publications and Talks

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### JOURNALS ARTICLES AND CONFERENCE PAPERS

- **Delano M**, and Sodini C, “Evaluating calf bioimpedance measurements for fluid overload management in a controlled environment,” *Physiological Measurement*, November 2018.
- **Delano M**, and Sodini C, “Electrode Placement for Calf Bioimpedance Measurements During Hemodialysis,” in *Engineering in Medicine and Biology Conference*, 2018.
- **Delano M**, and Sodini C, “A Long Term Wearable Electrocardiogram Measurement System,” in *Body Sensor Networks Conference*, 2013; 1-6.
- Winokur E, **Delano M**, and Sodini C, “A Wearable Cardiac Monitor for Long-term Data Acquisition and Analysis,” *Transactions on Biomedical Engineering*, 2013 Jan; 60(1):189-92.
- Egner T, **Delano M**, and Hirsch J, “Separate conflict-specific cognitive control mechanisms in the human brain,” *Neuroimage* 2007; 35(2), 940-948.

### CONFERENCE PRESENTATIONS

- **Delano M**, Wang K, and Sodini C, “Toward Remote Congestive Heart Failure Management using Calf Bioimpedance Measurements”, IEEE Biomedical and Health Informatics Conference, Chicago, IL, May 21, 2019.
- **Delano M**, “Building Myself Back Up.” Show & Tell Talk, Quantified Self Global Conference, San Francisco, CA, June 18, 2015.
- **Delano M**, “ECG and Activity Tracking: What Can We Learn?” Show & Tell Talk, Quantified Self Global Conference, San Francisco, CA, October 10, 2013.

### INVITED TALKS AND PANELS

- Invited Talk: “A Portable Bioimpedance Spectroscopy Measurement System for Congestive Heart Failure Management,” University of Alabama, October 12th, 2018.
- Invited Talk: “The Case for Open Instrumentation,” Quantified Self Public Health Symposium, San Diego, CA, April 19th, 2018.
- Invited Talk: “A Portable Bioimpedance Spectroscopy Measurement System for Congestive Heart Failure Management,” Villanova University, Villanova, PA, April 16th, 2018.
- Invited Talk: “Home Monitoring for Patients with Congestive Heart Failure,” MIT Portugal International Industry Roundtable, Lisbon, Portugal, April 3rd, 2017.
- Panelist: Women In Innovation Series - Wearables, Harvard College Women’s Center, Cambridge, MA, March 8th, 2017.
- Invited Talk: “A Portable Bioimpedance Measurement System for Congestive Heart Failure (CHF) Management.” Rising Stars in Biomedical Workshop, November 9, 2016.
- Breakout Session: “QSXX and Women Specific QS Conversations,” Quantified Self Global Conference, San Francisco CA, June 18th, 2015.

- Invited Talk: “Bioimpedance Spectroscopy (BIS) Measurements for Edema Monitoring in CHF Patients,” Korey Stringer Institute at UCONN, Storrs, CT, June 10th, 2015.
- Breakout Session: “QSXX: Breakout for Women-Specific Conversations,” Quantified Self Global Conference, San Francisco CA, October 10, 2013.
- Guest Lecture: “Productivity and Quantified Self.” STS.091 (Critical Issues in STS: Data as Self), October 21, 2013.

## WORKSHOPS

- Sketch Model Workshop, Olin College, June 18th–20th, 2018, Needham, MA (competitive application process).
- Make the Breast Pump Not Suck Hackathon, MIT Media Lab, April 28th–29th, 2018, Cambridge, MA (competitive application process).
- Project Catalyst: How to Engineer Engineering Education, Bucknell College, July 17th–19th, 2017, Lewisburg, PA.

## POSTERS

- **Delano M** and Sodini C, “A Portable Bioimpedance Measurement System for Congestive Heart Failure (CHF) Management.” Poster, IEEE Symposium on Medical Electronic Devices and Systems (ISMEDS), Cambridge, MA, May 8, 2014. Also presented at ISMEDS 2015 and MTL Annual Research Conference (MARC) 2015.
- **Delano M** and Sodini C, “A Long-Term Wearable Electrocardiogram Measurement System.” Poster, Medical Electronic Device Realization Center (MEDRC) Workshop, Cambridge, MA, May 2, 2013. Also presented at MARC 2014.

## Reviews and Memberships ---

### REVIEWER

- Physiological Measurement
- Biomedical Physics & Engineering Express
- IEEE Biomedical Health Informatics and Body Sensor Networks Conference
- IEEE Engineering in Medicine and Biology Conference

### MEMBERSHIPS

- IEEE Young Professionals
- IEEE Engineering in Medicine and Biology Society, Member
- IEEE Women in Engineering
- Sigma Xi, Member

# Teaching

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## **Swarthmore College**

ASSISTANT PROFESSOR

*Swarthmore, PA, USA*

*Jan. 2018 – Present*

- Embedded Systems (Spring 2018, Spring 2019).
- Digital Systems and Computer Engineering Fundamentals (Fall 2018).
- Design of Digital and Embedded Systems (Fall 2018).
- Computer Architecture (Spring 2019).

## **Design of Medical Devices (MIT 2.75/6.025)**

ELECTRICAL ENGINEERING INSTRUCTOR

*Cambridge, MA, USA*

*Sept. 2012 – Dec. 2016*

- Four-time Electrical Engineering Instructor.
- Weekly one-on-one mentoring of 3-5 person student teams, each prototyping medical devices.
- Develop curriculum and syllabus.
- Support student publications.
- Designed, wrote, and run yearly ECG lab.
- Designed, wrote, and graded problem sets.

## **Preparation for Undergraduate Thesis (MIT 6.UAT)**

TEACHING ASSISTANT

*Cambridge, MA, USA*

*Fall 2010*

- TA for two recitation sections working closely with faculty instructors.
- Ran recitations day-to-day.
- Provided individualized feedback to help students improve presentation skills.
- Filmed in class presentations.
- Graded assignments.

## **Microcontroller Laboratory (MIT 6.115)**

LABORATORY ASSISTANT

*Cambridge, MA, USA*

*Spring 2010*

- Helped students during staffed lab hours.
- Ran lab checkoffs.
- Graded laboratory notebooks.

# Community Involvement

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## **MIT Senior House**

GRADUATE RESIDENCE TUTOR (GRT)

*Cambridge, MA, USA*

*Aug. 2014 - Jun. 2017*

- Work as part of team of GRTs, faculty, and staff.
- Provide individualized and community support and resources for undergraduate students.
- Served on Housemaster Search Committee.
- Served on GRT Feedback Committee.
- Participated in GRT Role Meetings with Chancellor Barnhart.

## **Quantified Self (QS)**

MEETUP ORGANIZER

*Cambridge, MA, USA*

*Jan. 2013 - Jun. 2017*

- Started a Boston based women's meetup group.
- Select show & tell speakers for Quantified Self Boston meetups.
- Wrote Quantified Self's first Code of Conduct.
- Served on Quantified Self's diversity committee for the 2015 Global Conference.

## **MIT Undergraduate Association (UA)**

VICE PRESIDENT

*Cambridge, MA, USA*

*Spring 2009 - Spring 2010*

- Elected in four ticket election with 50% of undergraduate vote (919/1806).
- Represented MIT undergraduates on issues ranging from student life to academic policy.
- Oversaw over 10 UA Committees.
- Ran UA's Institute Committee Nomination Process (Nomcomm).

## Honors & Awards

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2016	<b>Top Pitch in Session</b> , Microsystems Technology Lab Annual Research Conference	<i>Bretton Woods, NH</i>
2014	<b>Top Pitch in Session</b> , Microsystems Technology Lab Annual Research Conference	<i>Bretton Woods, NH</i>
2010	<b>Analog Minority Scholarship</b> , Texas Instruments	<i>Dallas, TX</i>
2006	<b>Second Place in Category</b> , Intel International Science and Engineering Fair (ISEF)	<i>Indianapolis, IN</i>
2006	<b>Top 6</b> , National Junior Sciences and Humanities Symposium (JSHS)	<i>Albuquerque, NM</i>
2005	<b>Semi-Finalist</b> , Intel Science Talent Search (STS)	<i>Washington, DC</i>

## Selected Writing and Press

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### WRITING

- **Delano M**, How Bad Institutional Support Cost Douglas Prasher a Nobel Prize. Medium, October 11 2016.
- **Delano M**, Using Inclusive Language in Research Articles. Medium, November 16 2015.
- **Delano M**, I tried tracking my period and it was even worse than I could have imagined. Medium, February 23, 2015.
- **Delano M**, "A Code of Conduct." Quantified Self Blog, June 27, 2014.
- **Delano M**, My Roommate Has An Iron Uterus. Period. The Zine., 2013.

### PRESS

- Abrams A., "These real-life cyborgs hack their bodies with chips, magnets and other tech." The Washington Post, June, 2016.
- "Ahead of What's Possible, Health Innovations Stem from Great Partnerships." MEDRC Research Feature, Analog.com, June, 2015.
- Eveleth R., "How Self-Tracking Apps Exclude Women." The Atlantic, December 15, 2014.
- Ramirez E., "Inclusion and Diversity at QS15." Quantified Self Blog, October 14, 2014.
- Dooe M. "Apps for Better Sleep, Apps to Keep you awake." WGBH Innovation Hub, April 11, 2014.
- Greenhall A, "Quantified Self at the Frontier of Feminism." Model View Culture Quarterly No. 1, 2014.

## Skills

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<b>Hardware</b>	Basic and Advanced Electronics Lab Skills (Soldering, Oscilloscopes, Impedance Analyzers, etc.)
<b>PCBs</b>	Altium and Eagle, for schematic design and layout
<b>Software</b>	Embedded C, MATLAB, Version Control (Git, SVN), $\text{\LaTeX}$ , some: Objective C (iOS), Python, Javascript
<b>OS</b>	Windows, Mac, Linux
<b>People</b>	Certified Mediator (completed 40 hr training), QPR trained