Maggie K. **Delano**

Medical Device Designer · Assistant Professor

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Education

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

Swarthmore College — *Swarthmore, PA, USA*
Assistant Professor of Engineering — *January 2018 – Present*

- Teach introductory and advanced elective courses in Digital and Embedded Systems.
- Developed and teach Inclusive Engineering Design elective.
- Supervise senior design projects and research students.
- Maintain active research program in developing medical devices for patients with chronic diseases and in inclusive engineering design.
- Serve on commitees including the Maker Space Committee.

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.

Boston Scientific (Cardiac Rhythm Management) *St. Paul, MN, USA*

Research Intern *June 2009 – August 2009*

- 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

Journal Articles and Conference Papers

* = contributed equally

- Albert K*, **Delano M***, Sex Trouble: Sex/Gender Slippage, Sex Confusion, and Sex Obsession in Machine Learning Using Electronic Health Records. *Patterns*, In Press.
- **Delano M**, Ganapati V, Kamal R, Le B, Le J, Evaluating Research Grade Bioimpedance Hardware Using Textile Electrodes for Long-Term Fluid Status Monitoring. *Frontiers In Electronics*, January, 2022.
- Albert K*, **Delano M***, Kulynych B*, Kumar R*, Adversarial for Good? How the Adversarial ML Community's Values Impede Socially Beneficial Uses of Attacks, in *ICML 2021 Workshop on Adversarial Machine Learning*, June 2021.
- **Delano M**, Teaching Inclusive Engineering Design at a Small Liberal Arts College, in *Co-Designing Resources for Ethics Education in HCI Workshop at CHI 2021*, May 2021.
- Albert K*, **Delano M***, "The Whole Thing Smacks of Gender": Algorithmic Exclusion in Bioimpedance-based Body Composition Analysis, in *ACM Conference on Fairness, Accountability, and Transparency (ACM FAccT)*, March 2021.
- Albert K*, **Delano M***, Penny J*, Rigot A*, Kumar R*, Ethical Testing in the Real World: Evaluating Physical Testing of Adversarial Machine Learning, in *Neural Information Processing Systems Conference, Workshop on Dataset Curation and Security and Workshop on Navigating the Broader Impacts of AI Research*, 2020.
- **Delano M**, Band Electrodes Reduce Simulated Calf Bioimpedance Measurement Errors Due to Muscle Anisotropy, in *Engineering in Medicine and Biology Conference*, 2020.
- Wang K, Zelko D, **Delano M**, Textile band electrodes as an alternative to spot Ag/AgCl electrodes for calf bioimpedance measurements, *Biomedical Physics & Engineering Express*, 6(1), 2019.
- **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**, "Quantifying My PhD: Pomodoros and Productivity." Show & Tell Talk, Quantified Self Global Conference, Portland, OR September 22, 2018.

- **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: "Sex Trouble: Challenges and Opportunities for Trans-Inclusive Medical AI", at The future of medicine: development and applications of AI in disease biology and health care, May 24, 2022.
- Invited Talk: "The Whole Thing Smacks Of Gender: Algorithmic Exclusion In Body Composition Analysis And Beyond" (with Kendra Albert), UmeåUniversity Humlab Talk, March 9, 2022.
- Invited Talk: "Inclusive Engineering Design," Swarthmore Board of Managers, February, 2021.
- Guest Lecture: "Wearable Sensing: Opportunities, Limitations, and Considerations," Olin College, October 28th, 2019.
- Invited Talks: "Inclusive Design Quizzo," Swarthmore College and Olin College, Fall 2019.
- 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.

Service 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
- NeurIPS (Dataset and Benchmarks Track)

Committees

- Provost Advisory Committee (Summer 2020)
- Maker Space Committee (Spring 2019 – Summer 2021)
- Sigma Xi Engineering Representative (Fall 2019 – Summer 2021)

Memberships

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

Teaching

Swarthmore College *Swarthmore, PA, USA*

Assistant Professor *Jan. 2018 – Present*

- Embedded Systems (Spring 2018, Spring 2019, Spring 2020).
- Digital Systems and Computer Engineering Fundamentals (Fall 2018, Fall 2019, Fall 2020).
- Computer Architecture (Spring 2019, Spring 2021).
- Inclusive Engineering Design (Fall 2020).

Design of Medical Devices (MIT 2.75/6.025) *Cambridge, MA, USA*

Electrical Engineering Instructor *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 ran yearly ECG lab.
- Designed, wrote, and graded problem sets.

Preparation for Undergraduate Thesis (MIT 6.UAT) *Cambridge, MA, USA*

Teaching Assistant *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) *Cambridge, MA, USA*

Laboratory Assistant *Spring 2010*

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

Community Involvement

MIT Senior House *Cambridge, MA, USA*

Graduate Residence Tutor (GRT) *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) *Cambridge, MA, USA*

Meetup Organizer *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) *Cambridge, MA, USA*

Vice President *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

2020	**Reviewer of the Year,** Physiological Measurement	
2016	**Top Pitch in Session,** Microsystems Technology Lab Annual Research Conference	*Bretton Woods, NH*
2014	**Top Pitch in Session,** Microsystems Technology Lab Annual Research Conference	*Bretton Woods, NH*
2010	**Analog Minority Scholarship,** Texas Instruments	*Dallas, TX*
2006	**Second Place in Category,** Intel International Science and Engineering Fair (ISEF)	*Indianapolis, IN*
2006	**Top 6,** National Junior Sciences and Humanities Symposium (JSHS)	*Albuquerque, NM*
2005	**Semi-Finalist,** Intel Science Talent Search (STS)	*Washington, DC*

Selected Writing and Press

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

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