

Maggie K. Delano

MEDICAL DEVICE DESIGNER · ASSOCIATE PROFESSOR

✉ mdelano1@swarthmore.edu | 🏠 maggiedelano.com | 📺 maggiedelano

Education

Massachusetts Institute of Technology

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

Cambridge, MA, USA

Sept. 2012 - Jan. 2018

Massachusetts Institute of Technology / Harvard Medical School

GRADUATE EDUCATION IN MEDICAL SCIENCES (GEMS) CERTIFICATE PROGRAM

Cambridge, MA, USA

Feb. 2013 - Dec. 2015

Massachusetts Institute of Technology

MASTER'S OF ENGINEERING IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Cambridge, MA, USA

Aug. 2010 - June 2012

Massachusetts Institute of Technology

BACHELOR OF SCIENCE IN ELECTRICAL SCIENCE AND ENGINEERING

Cambridge, MA, USA

Sept. 2006 - June 2010

Experience

Swarthmore College

ASSOCIATE PROFESSOR OF ENGINEERING

Swarthmore, PA, USA

February 2024 – Present

Swarthmore College

ASSISTANT PROFESSOR OF ENGINEERING

Swarthmore, PA, USA

January 2018 – February 2024

- Teach introductory and advanced elective courses in Digital and Embedded Systems, along with an 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 committees including the Maker Space Committee and Strategic Planning Committee.

Sodini Medical Electronics Research Group

PHD THESIS PROJECT

Cambridge, MA, USA

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

RESEARCH INTERN

San Francisco, CA, USA

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

MENG THESIS PROJECT

Cambridge, MA, USA

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)

RESEARCH INTERN

St. Paul, MN, USA

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, underline = undergraduate or high school researcher

- Aghi, K, et al., Rigorous science demands support of transgender scientists, *Cell* 187(6):1327-1334 March 2024.
- Scagliusi S, **Delano M**, Pérez P, Martín D, Huertas G, Olmo A, Yúfera A, A Novel Wearable Device for Continuous Bioimpedance Monitoring in Congestive Heart Failure Patients, in *16th International Workshop on Impedance Spectroscopy 2023*. **Best Paper Award**
- Scagliusi S, **Delano M**, Characterization and Correction of Low Frequency Artifacts in Segmental Bioimpedance Measurements, in *IEEE Engineering in Medicine and Biology Conference 2023*.
- Scagliusi S, Pérez P, Martín D, Huertas G, Olmo A, Yúfera A, **Delano M**, Enhancing the Precision of AD5940 Segmental Bioimpedance Measurements through Self-Calibration, in *IEEE Biosensors Conference 2023*.
- Albert K*, **Delano M***, Algorithmic Exclusion, in *Handbook of Critical Studies of Artificial Intelligence*, Edward Elgar Publishing, 2023.
- Albert K*, **Delano M***, Two researchers share how their cross disciplinary collaboration enables work to guide the future of data science. *Patterns* 3(8):100573 August 2022.
- Albert K*, **Delano M***, Sex Trouble: Sex/Gender Slippage Sex Confusion and Sex Obsession in Machine Learning Using Electronic Health Records. *Patterns* 3(8):100534 August 2022.
- **Delano M**, Ganapati V, Kamal R, Le B, Le J, Mendoza R, 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 *IEEE 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 *IEEE 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** “Quantifying My PhD: Pomodoros and Productivity.” Show & Tell Talk, Quantified Self Global Conference, Portland, OR September 22, 2018.
- **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: “Designing Inclusive Medical Machine Learning Datasets: Challenges and Opportunities”, Cornell Medical Machine Learning Seminar Series, October 25, 2024.
- Invited Talk: “Supporting Trans Scientists: From Healthcare to Academia”, American Statistical Association LGBTQ+ Advocacy Committee Webinar, June 12, 2024.
- Invited Talks: “Designing Trans Inclusive Medical Machine Learning Datasets and Models: Challenges and Opportunities”, Queer in AI at NeurIPS, December 11, 2023, GLEAM Security at Microsoft, March 29, 2024.
- Faculty Lecture: “Improving Healthcare through Engineering Design and Methods”, Swarthmore College Faculty Lecture Series, September 13, 2022.
- 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), Umeå University 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

- Feminist perspectives on gender/sex in medical AI, Radboud University, November 7th–8th, 2024, Ravenstein, Netherlands (invite only).
- 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 (SELECTED)

- Physiological Measurement (2x Reviewer of the Year Award)
- 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)
- Cell Patterns
- ACM Fairness Accountability and Transparency Conference (FAccT)

COMMITTEES

- Teaching and Learning Commons Advisory Board (Fall 2023 – Spring 2024)
- Student Disability Services Advisory Board (Fall 2023 – Spring 2024)
- Strategic Working Group Subcommittee Chair: Engineering and the Liberal Arts (Fall 2022 – Spring 2023)
- Sigma Xi Engineering Representative (Fall 2019 – Summer 2021, Fall 2022 – Spring 2024)
- Provost Advisory Committee (Summer 2020)
- Maker Space Committee (Spring 2019 – Summer 2021)

MEMBERSHIPS

- IEEE Young Professionals
- IEEE Engineering in Medicine and Biology Society (EMBS)
- IEEE EMBS Technical Community on Cardiopulmonary Systems and Physiology-Based Engineering (CSPE)
- Sigma Xi
- Design Justice Network
- AAUP (Swarthmore Chapter)

Teaching

Swarthmore College

Swarthmore, PA, USA

ASSISTANT PROFESSOR

Jan. 2018 – Present

- Introduction to Engineering Design (Fall 2023).
- Inclusive Engineering Design (Fall 2020, Fall 2022, Fall 2023).
- Computer Architecture (Spring 2019, Spring 2021, Spring 2023).
- Digital Systems and Computer Engineering Fundamentals (Fall 2018, Fall 2019, Fall 2020, Fall 2022).
- Embedded Systems (Spring 2018, Spring 2019, Spring 2020, Spring 2023, Spring 2024).

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

Tech Abuse Roster Project

Online

MEMBER

Jan. 2022 - Present

- Work with an interdisciplinary team to develop platforms and resources to combat tech facilitated gender based violence.
- Document author and member of the Internet Engineering Task Force's Detected Unwanted Location Tracking Group (IETF DULT).

MIT Senior House

Cambridge, MA, USA

GRADUATE RESIDENCE TUTOR (GRT)

Aug. 2014 - Jun. 2017

- Worked as part of team of GRTs, faculty, and staff.
- Provided 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 MIT's Chancellor.

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

2024	Reviewer of the Year , Physiological Measurement	
2020	Reviewer of the Year , Physiological Measurement	
2016	Top Pitch in Session , Microsystems Technology Lab Annual Research Conference	<i>Bretton Woods, NH</i>
2014	Top Pitch in Session , Microsystems Technology Lab Annual Research Conference	<i>Bretton Woods, NH</i>
2010	Analog Minority Scholarship , Texas Instruments	<i>Dallas, TX</i>
2006	Second Place in Category , Intel International Science and Engineering Fair (ISEF)	<i>Indianapolis, IN</i>
2006	Top 6 , National Junior Sciences and Humanities Symposium (JSHS)	<i>Albuquerque, NM</i>
2005	Semi-Finalist , Intel Science Talent Search (STS)	<i>Washington, DC</i>

Selected Writing and Press

WRITING

- Albert K, **Delano M**, Weil E, Fear Uncertainty and Period Trackers. Medium June 28, 2022.
- **Delano M**, Enough with the beeping: Apple needs to enable active Bluetooth scanning on iOS to prevent stalking using Apple AirTags. Personal Blog February 21, 2022.
- **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

- Mithani, J., "Would you trust AI to scan your genitals for STIs?" 19th News, September, 2024.
- Willyard, C., "Why engineers are working to build better pulse oximeters." MIT Technology Review, February, 2024.
- Hertz M., "Falling Through The Cracks: Cataloguing Gender and Sex in Electronic Health Records." Farsight January, 2023.
- Roberts C., "How to Keep Your Apple Watch Ovulation Data Private." Consumer Reports September, 2022.
- "Taking care with source security when reporting on abortion." Freedom of the Press Foundation July, 2022.
- Riley, T., "Post-Roe reproductive privacy goes beyond period trackers, experts say." Cyberscoop, June, 2022.
- Heinrichs A., "These Women Were Stalked With AirTags. They Never Got Justice." Jezebel March, 2022.
- 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.
- Krantz, L. and Rocheleau M. MIT eases workload offers support after recent suicides. Boston Globe March 17, 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
Programming	C/C++, MATLAB, Python, Git, LaTeX , some: Objective C (iOS), Javascript, Datalog
OS	Windows, Mac, Linux
People	Certified Mediator (completed 40 hr training), QPR trained