

# Tom J. Zajdel

Assistant Teaching Professor at Carnegie Mellon University

## Academic Appointments

*Carnegie Mellon University*

**Assistant Teaching Professor**, Department of Electrical and Computer Engineering 2021-present

## Education and Training

*Princeton University*

**Postdoctoral Research Associate** in Mechanical & Aerospace Engineering 2018-2021

*University of California, Berkeley*

**Ph.D in Electrical Engineering** 2018

*The Ohio State University*

**B.S. in Electrical and Computer Engineering** 2012

## Awards & Honors

**NJ ACTS Postdoctoral Fellowship**, NIH Clinical and Translational Science Awards 2019-2020

**Outstanding Graduate Student Instructor Award**, UC Berkeley 2018

**Best Paper, ECE Division**, ASEE Annual Conference & Exposition 2016

**Biophysical Journal Outstanding Student Poster Award** 2016

**Berkeley EECS Chair's Special Award** 2015

**NSF Graduate Research Fellowship** 2012-2017

**UC Berkeley Chancellor's Fellowship** 2012-2014

**Most Outstanding Undergraduate Teaching Assistant**, OSU First-Year Eng. Honors 2010

## Teaching

### Carnegie Mellon University

18095 - Getting Started in Electronics: An Experiential Approach

F22

18100 - Introduction to ECE

w/ Greg Kesden

S22

w/ Jimmy Zhu

F21

18059 - Introduction to Amateur Radio

S22/F22

18729 - Board-level RF Systems for the Internet of Things

w/ Rick Carley

F22

## University of California Berkeley

EE198/298 - Hands-on Ham Radio

Acting Instructor

F16/S17

EE40LX - Electronic Interfaces MOOC

w/ Michel Maharbiz

S14/Su15

EE40 - Introduction to Microelectronic Circuits

Head Laboratory Graduate Student Instructor

F14

Pre-Engineering Program: Introduction to Mechanics

Instructor

Aug13/Aug14/Aug15/Aug16

## Ohio State University

ECE301 - Design and Analysis in Circuits

Grader

F11

ENG191/192/193 - Fundamentals of Engineering Honors Sequence

Undergraduate Teaching Assistant

F09/W10/W11/W12/S11/S12

## Undergraduate Research Mentorship

Student	Program	Epoch
Janet Wang	Princeton ECE	2021
Linus Wang	Princeton ME	2019-2021
Heather Cho	Princeton Chem/BioE	2019
Meera Lester	UC Berkeley EECS	2018
Andrew Nam	UC Berkeley EECS	2017-2018
Jove Yuan	UC Berkeley EECS	2017-2018
Debleena Sengupta	UC Berkeley EECS	2015-2017
Victor Tieu	UC Berkeley BioE	2015-2017
Alex Walczak	UC Berkeley EECS	2014-2017
Robin Herbert	Berkeley CC Biotech	2012-2013

## Publications

\*indicates equal contribution

### Journal Publications

1. J. LaChance, M. Schottdorf, **T.J. Zajdel**, J.L. Saunders, S. Dvali, C. Marshall, L. Seirup, I. Sammour, R.L. Chatburn, D.A. Notterman, D.J. Cohen, PVP1—The People’s Ventilator Project: A fully open, low-cost, pressure-controlled ventilator research platform compatible with adult and pediatric uses, *PLOS One*, vol. 17, no. 5, pg. e0266810, 2022.
2. A.E. Wolf, M.A. Heinrich, I.B. Breinyn, **T.J. Zajdel**, D.J. Cohen, Short-term stimulation of collective cell migration in tissues reprograms long-term supracellular dynamics, *PNAS nexus*, vol. 1, no. 1, pg. pgac002, 2021.
3. **T.J. Zajdel**, G. Shim, and D.J. Cohen, Come together: On-chip bioelectric wound closure, *Biosensors and Bioelectronics*, vol. 192, p. 113479, 2021.
4. **T.J. Zajdel\***, G. Shim\*, L. Wang, A. Rossello-Martinez, D.J. Cohen, SCHEPDOG: programming electric cues to dynamically herd large-scale cell migration, *Cell Systems*, vol. 10, no. 6, pp. 506-514, 2020.
5. M.H. Heinrich, J.M. LaChance, R. Alert, **T.J. Zajdel**, A. Košmrlj, D.J. Cohen, Size-dependent patterns of cell proliferation and migration in freely-expanding epithelia, *eLife*, vol. 9, p. e58945, 2020.
6. L. Su, T. Fukushima, A. Prior, M. Baruch, **T.J. Zajdel**, C.M. Ajo-Franklin, Enhancing current production in engineered *E. coli* by modifying the cytochrome *c* maturation pathway, *ACS Synthetic Biology*, vol 9. no. 1, pp.115-124, 2019.
7. **T.J. Zajdel\***, M. Baruch\*, G. Mehes\*, D.T. Simon, M.M. Maharbiz, C.M. Ajo-Franklin, PEDOT:PSS-based multilayer bacterial-composite films for bioelectronics, *Scientific Reports*, vol. 8, p. 1529314, 2018.
8. M.A. TerAvest, **T.J. Zajdel**, and C.M. Ajo-Franklin, The Mtr pathway of *Shewanella oneidensis* MR-1 couples substrate utilization to current production in *Escherichia coli*, *ChemElectroChem*, vol. 1, no. 11, pp. 1874-1879, 2014.
9. M.A. Demir, J.T. Johnson, and **T.J. Zajdel**, A Study of the Fourth-Order Small Perturbation Method for Scattering from Two-Layer Rough Surfaces, *IEEE Transactions on Geoscience and Remote Sensing*, vol. 50, no. 9, pp. 3374-3382, 2012.

### Reviewed Conference Proceedings

1. **T.J. Zajdel**, A. Nam, J. Yuan, V. Shirsat, B. Rad, and M.M. Maharbiz, Applying machine learning to the flagellar motor for biosensing, *Proceedings of the 2018 IEEE Engineering in Medicine and Biology Conference*, Jul 2018.
2. **T.J. Zajdel**, A.N. Walczak, D. Sengupta, V. Tieu, B. Rad, and M.M. Maharbiz, Towards a biohybrid sensing platform built on impedance-based bacterial flagellar motor tachometry, *Proceedings of the 2017 IEEE BioCAS Conference*, Oct 2017.
3. **T.J. Zajdel** and M.M. Maharbiz, Teaching design with a tinkering-based circuits laboratory, *Proceedings of 2016 IEEE Frontiers in Education Conference*, Oct 2016.
4. **T.J. Zajdel** and M.M. Maharbiz, Introducing electronics at scale with a massive online circuits lab, *Proceedings of 123rd ASEE Annual Conference and Exposition*, Jun 2016.

5. A.Y. Zhou, **T.J. Zajdel**, M.A. TerAvest, and M.M. Maharbiz, A miniaturized monitoring system for electrochemical biosensing using *Shewanella oneidensis* in environmental applications, *Proceedings of 2015 Engineering in Medicine and Biology Conference*, Aug 2015.
6. **T.J. Zajdel**, M.A. TerAvest, B. Rad, C.M. Ajo-Franklin, and M.M. Maharbiz, Probing the dynamics of the proton-motive force of *E. coli*, *Proceedings of the 2014 IEEE Sensors Conference*, Nov 2014.

## **Preprints**

1. D. Suo, U. Ghai, E. Minasyan, P. Gradu, X. Chen, N. Agarwal, C. Zhang, K. Singh, J. LaChance, **T. Zajdel**, M. Schottdorf, D. Cohen, and E. Hazan, Machine learning for mechanical ventilation control, *arXiv*, 2021.

## **Presentations**

### **Research Talks**

<u>Characterizing electrotaxis for control of cellular migration</u> , APS Annual Meeting	March 2019
<u>Environmental BioSensing: Engineering bacteria-based floating sensor nodes</u> , Berkeley BSAC IAB	March 2016
<u>Electronic interfaces for synthetic biology</u> , Agilent-UC Berkeley SBI Technical Exchange Workshop	October 2014

### **Research Posters**

<u>A chemotactic bacteria-based biohybrid sensor</u> , LBNL Molecular Foundry User Meeting	August 2017
<u>Impedance-based electrochemical readout of bacterial flagellar rotation</u> , BPS Biomolecular Motors	June 2016

### **Public Outreach**

<u>J. R. Brinkley: The Goat Doctor is on the Air</u> , Odd Salon NYC	August 2019
<u>The radio spectrum and you</u> , Princeton Public Library Tower to Town Lecture Series	June 2019

## **Service**

### **Advising**

MS Advising, CMU ECE	2022-present
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### **Internal Committees**

Undergraduate Studies, CMU ECE	2021-present
Curriculum Core, CMU ECE	2021-present

### **Reviewer**

NJ ACTS Fellowship Program	2022-present
American Society for Engineering Education Annual Conference	2016-present
IEEE Engineering in Medicine and Biology Conference	2018
IEEE Frontiers in Education Conference	2016