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
Mentor: Daniel Cohen

University of California, Berkeley

Ph.D in Electrical Engineering 2018
Mentors: Michel Maharbiz & Caroline Ajo-Franklin

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, SCHEEPDOG: 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

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

Research Posters

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

Public Outreach

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

Service

Advising

MS Advising, CMU ECE	2022-present

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