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

Spring 2023	18-059: *Introduction to Amateur Radio* 18-095: *Getting Started in Electronics* 18-100: *Introduction to ECE* (with Greg Kesden)
Fall 2022	18-095: *Getting Started in Electronics* 18-358: *Introduction to Amateur Radio* 18-729: *Board-level RF Systems for the Internet of Things* (with Rick Carley)
Spring 2022	18-100: *Introduction to ECE* (with Greg Kesden) 18-358: *Introduction to Amateur Radio*

Fall 2021	18-100: *Introduction to ECE* (with Jimmy Zhu)

University of California, Berkeley (Graduate Student Instructor)

Spring 2018	EE198: *Hands on Ham Radio* (Acting Instructor for Miki Lustig)
Fall 2017	EE198: *Hands on Ham Radio* (Acting Instructor for Miki Lustig)
Summer 2016	*PREP Physics* for incoming Engineering students (Instructor)
Summer 2015	EE40LX: *Analog Interfaces MOOC* (with Michel Maharbiz)
	PREP Physics for incoming Engineering students (Instructor)
Spring 2015	EE40LX: *Analog Interfaces MOOC* (with Michel Maharbiz)
Summer 2014	*PREP Physics* for incoming Engineering students (Instructor)
Fall 2014	EE40: *Intro to Microelectronic Circuits* (Lead Lab GSI for Michel Maharbiz)
Summer 2013	*PREP Physics* for incoming Engineering students (Instructor)

Ohio State University (Undergraduate Teaching Assistant)

Spring 2012	ENG H193: *Fundamentals of Engineering: Design* (UTA for Rick Freuler)
Winter 2012	ENG H192: *Fundamentals of Engineering: Programming* (UTA for Rick Freuler)
Fall 2011	ECE 301: *Electronic Circuit Design* (Grader for Steve Bibyk)
Winter 2011	ENG H192: *Fundamentals of Engineering: Programming* (UTA for Paul Clingan)
Spring 2010	ENG H193: *Fundamentals of Engineering: Design* (UTA for Kathy Harper)
Winter 2010	ENG H192: *Fundamentals of Engineering: Programming* (UTA for Mike Hoffmann)
Fall 2009	ENG H191: *Fundamentals of Engineering: CAD* (Lab UTA for Will Wolfe)

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

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

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

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