

# ALISON I WEBER

Park Science Center 210, Department of Biology, Bryn Mawr College  
aiweber@brynmawr.edu

## EDUCATION

<b>University of Washington</b> a	Neuroscience, Ph.D. Certificate in Neural Computation & Engineering March 2019
<b>University of Chicago</b> a	Biological Sciences, B.A. Minor in Computational Neuroscience June 2011

## RESEARCH

<b>A t t</b> Bryn Mawr College Aug 2023 - present	Research areas: mechanosensory encoding in insect wings efficient & robust sensing strategies interaction of neural encoding, body structure, & behavior
<b>S t t F t D t</b> University of Washington Oct 2019 - Jul 2023	Advisors: Tom Daniel, Dept. of Biology Bing Brunton, Dept. of Biology
<b>D t C t</b> University of Washington Sep 2012 - Mar 2019	Advisors: Fred Rieke, Dept. of Physiology & Biophysics Eric Shea-Brown, Dept. of Applied Mathematics
<b>t A t t</b> University of Chicago Jun 2009 - Dec 2011	Advisor: Sliman Bensmaia, Dept. of Organismal Biology & Anatomy

## MENTORSHIP

<b>G t</b>	Aman Mamo, master's student in Materials Science & Engineering
<b>t t &amp; t</b>	Christina Wang, post-baccalaureate research assistant Mars Torres, post-baccalaureate research assistant Abby von Hagel, Washington Research Foundation Innovation Post-baccalaureate Fellow in Neuroengineering
<b>H t</b>	Lucie Wolf, summer research assistant

## TEACHING

---

*I t t* , Sensory Physiology (original course)

Bryn Mawr College, Spring 2024

*I t t* , Senior Seminar in Science & Society

Bryn Mawr College, Spring 2024

*I t t* , Computational Methods in the Sciences (original course)

Bryn Mawr College, Fall 2023

*C-I t t* , Controlling the Brain: Scientific, Therapeutic, & Ethical Implications of New Neurotechnologies (original course)

University of Washington Bothell, Spring 2022

*G t t* , Neurobiology

University of Washington, Winter 2021

*C-I t t* , Introduction to Brains & Neuroscience

University of Washington, Spring 2020

*I t t* , Readings in Neurobiology: Linking Single Neuron3-207.372Td(Instructor)Tj/F310.364Tf(,)eoBraF310.3


7. **Weber AI\***, Krishnamurthy K\*, & Fairhall A. (2019) Coding principles in adaptation. *Nature* 5: 427-449. v
8. Saal HP, Suresh AK, Solorzano LE, **Weber AI** & Bensmaia SJ. (2018) The effect of contact force on the responses of tactile nerve fibers to scanned textures. *Nature* 389: 99-103.
9. **Weber AI** & Pillow JW. (2017) Capturing the dynamical repertoire of single neurons with generalized linear models. *Neuron* 29(12): 3260-3289.  
Code available: [github.com/aiweber/GLM\\_and\\_Izhikevich](https://github.com/aiweber/GLM_and_Izhikevich)
10. Lieber JD, Xia X, **Weber AI** & Bensmaia SJ. (2017) The neural code for tactile roughness in the somatosensory nerves. *Nature* 118(6):3107-3117.
11. Brinkman BAW\*, **Weber AI\***, Rieke F<sup>◇</sup>, & Shea-Brown E<sup>◇</sup>. (2016) How do efficient coding strategies depend on origins of noise in neural circuits? *Neuron* 12(10): e1005150. ● m
12. **Weber AI\***, Saal HP\*, Cheng JW, Lieber JD, Manfredi LR, Dammann JF, & Bensmaia SJ. (2013) Spatial and temporal codes mediate the tactile perception of natural textures. *Nature* 110(42): 17107-12.
13. Cheng JW, **Weber AI** & Bensmaia SJ. (2013) Comparing the effects of isoflurane and pentobarbital on the responses of cutaneous mechanoreceptive afferents. *Nature* 13: 10.
14. Yau JM, **Weber AI** & Bensmaia SJ. (2010) Separate mechanisms for audio-tactile pitch and loudness interactions. *Nature* 1: 160.

\*<sup>◇</sup> Equal contributions

## PRESENTATIONS

---

- v a
1. Sparse and efficient sensing in flight: Lessons from insect wings. (2023, December) Department of Mechanical Engineering, Villanova University.
2. Wing structure and neural encoding jointly determine sensing strategies in insect flight. (2023, September) SOAR 11, Annual Meeting of the Air Force Research Laboratory and Defence Laborator

3. Babaei M, **Weber AI**, Daniel TL, & Bergbreiter S. (2022, January) Nonuniform stiffness of insect wings enhances sensing performance. Society for Integrative & Comparative Biology Annual Meeting, Phoenix, AZ.
4. Stanchak KE, Deora T, Aiello BR, **Weber AI**, Moalin A, Sponberg S, & Brunton BW. (2022, January) Comparing the distribution of campaniform sensilla across insect wings to understand the functional consequences of sensor placement. Society for Integrative & Comparative Biology Annual Meeting, Phoenix, AZ.
5. **Weber AI**, Daniel TL, & Brunton BW. (2021, January) Neural encoding and structural properties interact to determine optimal placement of sparse, spiking sensors on an insect wing. Society for Integrative & Comparative Biology Annual Meeting, Washington, DC (Virtual).
6. Mamo AH, **Weber AI**, Mohren TL, Babaei M, & Daniel TL. (2021, January) Finite element analyses of flapping wings meets inertial sensing. Society for Integrative & Comparative Biology Annual Meeting, Washington, DC (Virtual).
7. Saal HP, Lieber JD, **Weber AI**, & Bensmaia SJ. (2014, February) & 

9. Saal HP, Lieber JD, Boundy-Singer ZM, **Weber AI**, & Bensmaia SJ. (2016, November) Tactile texture invariance and its peripheral neural basis. Society for Neuroscience Annual Meeting, San Diego, CA.
10. Saal HP, Lieber JD, Boundy-Singer ZM, **Weber AI**, & Bensmaia SJ. (2015, November) Inferring the neural representations underlying perceptual invariance in touch. Society for Neuroscience Annual Meeting, Chicago, IL.
11. Brinkman BAW\*, **Weber AI\***, Rieke F<sup>◇</sup>, & Shea-Brown E<sup>◇</sup>. (2015, March) Multiple noise sources shape optimal encoding strategies in fundamentally different ways. Computational & Systems Neuroscience (COSYNE), Salt Lake City, UT.
12. Brinkman BAW, **Weber AI**, Rieke F<sup>◇</sup>, & Shea-Brown E<sup>◇</sup>. (2014, July) Noise- and stimulus-dependence of the optimal encoding nonlinearities in a simple ON/OFF retinal circuit model. Annual Computational Neuroscience Meeting (CNS), Quebec City, Canada.
13. Saal HP, Lieber JD, Manfredi LR, **Weber AI**, Dammann JF, & Bensmaia SJ. (2013, November) The influence of fingerprint skin on texture perception. Society for Neuroscience Annual Meeting, San Diego, CA.
14. Lieber JD, **Weber AI**, Saal HP, & Bensmaia SJ. (2013, November) The peripheral neural code of tactile roughness for natural textures. Society for Neuroscience Annual Meeting, San Diego, CA.
15. Harvey MA, **Weber AI**, Best MD, & Bensmaia SJ. (2011, November) Spectro-temporal receptive field properties of neurons in primate somatosensory cortex. Society for Neuroscience Annual Meeting, Washington, DC.

\*<sup>◇</sup> Equal contributions



## FELLOWSHIPS, AWARDS, & HONORS







---

UW Data Science Postdoctoral Fellow, eScience Institute, Univ. of Washington  
 Washington Research Foundation Postdoctoral Fellow  
 NSF Graduate Research Fellow (GRFP), Mathematical Sciences  
 Achievement Rewards for College Scientists (ARCS) Fellow  
 Student Marshal, Univ. of Chicago  
 Phi Beta Kappa  
 Undergraduate Fellow in Neuroscience & Neuroengineering, Univ. of Chicago  
 Summer Program for Undergraduates in Neuroscience & Neuroengineering,  
 Univ. of Chicago  
 University Scholar (academic scholarship), Univ. of Chicago

## ADDITIONAL TRAINING

---

**S**   , Spring 2022  
 University of Washington, Seattle, WA  
 Mentored apprenticeship to learn inclusive, evidence-based, student-centered pedagogies

**C**       , Winter 2017  
 University of Washington, Seattle, WA  
 Quarter-long course culminating in a public lecture at Town Hall Seattle  
 Video: <https://www.youtube.com/watch?v=NXXjUXKUR6w&t=115s>

*t* **C** *St t* **Q** , Summer 2014  
Marine Biological Laboratory, Woods Hole, MA  
Summer course including an individual research project, from which publication [9] arose

## **SERVICE**