SARAH M. PUGLIESE

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EDUCATION

University of Washington, Ph.D. Candidate in Neuroscience 2022–*present*
Brown University, Sc.B. in Applied Mathematics-Biology 2016–2020

RESEARCH EXPERIENCE

Tuthill Lab and **Brunton Lab**, Graduate Student 2022–*present*
University of Washington · Seattle, WA
Studying the circuit basis of leg motor control in the *Drosophila melanogaster* ventral nerve cord using connectome datasets and data-driven network modeling.

Flavell Lab, Research Support Associate 2020–2022
Massachusetts Institute of Technology · Cambridge, MA
Investigated neural circuit mechanisms of persistent behavioral changes in *C. elegans* using optogenetics, calcium imaging, and behavioral data analysis.

Jones Lab, Undergraduate Researcher 2017–2020
Brown University · Providence, RI
Adapted the lab's computational model of neocortex to study the simulated effect of dendritic calcium events in pyramidal cells on canonical EEG/MEG waveforms.

Engineering Design Research Laboratory, REU in Mathematics
Indiana University-Purdue University Indianapolis · Indianapolis, IN 2018
Applied phase field models to topology optimization problems during a NSF-funded research opportunity focused on mathematical applications to medical sciences and bioengineering.

AWARDS AND GRANTS

Student Travel Grant, UW CoNECT and Weill NeuroHUB 2026
Honorable Mention, NSF Graduate Research Fellowship Program 2024
Jerome L. Stein Memorial Award for Undergraduate Excellence, Brown University Division of Applied Mathematics 2020
Katherine T. Romer Undergraduate Teaching and Research Award, Brown University 2019

PUBLICATIONS

† *Authors contributed equally*

Published articles

T. S. Kramer, F. K. Wan, **S. M. Pugliese**, A. A. Atanas, S. Pradhan, A. W. Hiser, L. M. Godinez, J. Luo, E. Bueno, T. Felt, S. W. Flavell, Neural sequences underlying directed turning in Caenorhabditis elegans. *Nature Neuroscience*. 2026

U. Dag, I. Nwabudike, D. Kang, M. A. Gomes, J. Kim, A. A. Atanas, E. Bueno, C. Estrem, **S. Pugliese**, Z. Wang, E. Towlson, S. W. Flavell, Dissecting the functional organization of the C. elegans serotonergic system at whole-brain scale. *Cell* **186**, 2574-2592.e20. 2023

R. G. Law, **S. Pugliese**, H. Shin, D. D. Sliva, S. Lee, S. Neymotin, C. Moore, S. R. Jones, Thalamocortical Mechanisms Regulating the Relationship between Transient Beta Events and Human Tactile Perception. *Cerebral Cortex* **32**, 668–688. 2022

Preprints

S. N. Baskoylu, A. Kundra, **S. Pugliese**, J. Kim, K. W. Maher, A. Hiser, F. Meng, C. Estrem, D. Kang, E. Bueno, S. W. Flavell, Deconstructing a behavioral state: parallel neural integrators control distinct features of an aversive behavioral state in C. elegans. *bioRxiv*. 2026

S. M. Pugliese, G. M. Chou, E. T. T. Abe, D. Turcu, J. K. Lancaster, J. C. Tuthill†, B. W. Brunton†, Connectome simulations identify a central pattern generator circuit for fly walking. *bioRxiv*. 2025

OTHER NOTABLE TRAINING

Connectomics from micro- to meso- and macro-scales, CAJAL Advanced Neuroscience Training Programme, Bordeaux School of Neuroscience — 2023

PRESENTATIONS

S. M. Pugliese, G. M. Chou, E. T. T. Abe, D. Turcu, J. K. Lancaster, J. C. Tuthill†, B. W. Brunton†, Connectome simulations identify a central pattern generator circuit for fly walking. *UW Neurobiology and Biophysics Hendrickson Trainee Symposium*. [Poster] — 2026

S. M. Pugliese. Connectome simulations predict a central pattern generator circuit for fly walking. *Synapses at Scale COSYNE Workshop*. [Talk] — 2026

S. M. Pugliese, G. M. Chou, E. T. T. Abe, D. Turcu, J. K. Lancaster, J. C. Tuthill†, B. W. Brunton†, Connectome simulations identify a central pattern generator circuit for fly walking. *COSYNE*. [Poster] — 2026

S. M. Pugliese, J. Lancaster, G. M. Chou, E. T. T. Abe, J. C. Tuthill, & B. W. Brunton. Connectome simulations reveal a central pattern generator (CPG) circuit for fly walking. *Analysis and Modeling of Connectomes Janelia Conference.* [Poster] — 2025

S. M. Pugliese. Connectome simulations reveal a core central pattern generator (CPG) circuit for fly walking. *UW CoNectome Symposium*. [Talk] — 2025

S. M. Pugliese, J. Lancaster, G. M. Chou, E. T. T. Abe, J. C. Tuthill, & B. W. Brunton. Connectome simulations reveal a central pattern generator (CPG) circuit for fly walking. *COSYNE.* [Poster] — 2025

S. Pugliese. Bridging connectomics and kinematics to model *Drosophila* locomotion. *NISC MURI Telecon.* [Talk] — 2024

S. Pugliese. Dynamical models of neurons and networks. *UW Computational Neuroscience Center Tea-Time Tutorial.* [Tutorial] — 2023

S. Pugliese, B. W. Brunton, & J. C. Tuthill. Constructing a connectome-based neuronal network model of fly locomotion. *CAJAL Connectomics from micro- to meso- and macro-scales.* [Poster] — 2023

S. Pugliese & S. Jones. Mathematical model of neocortex predicts that dendritic calcium spikes are visible in human EEG signals, *Brown University Summer Research Symposium.* [Poster] — 2019

S. Pugliese & A. Tovar. Investigation of Phase Field Methods in Topology Optimization, *IUPUI Center for Research and Learning Student Summer Poster Symposium.* [Poster] — 2018

TEACHING AND MENTORSHIP

Teaching Intern, BIOL 461: Neurobiology, University of Washington — 2024, 2025

Mentor, Neuroscience Mentorship Program, University of Washington — 2024

Mentor, Graduate Program in Neuroscience First Year Mentorship, University of Washington — 2024

Peer Advisor, Applied Math Peer Advising Program, Brown University — 2018–2020

Undergraduate Teaching Assistant, APMA 1710: Information Theory, Brown University — 2019

Undergraduate Teaching Assistant, NEUR 0680: Introduction to Computational Neuroscience, Brown University — 2018

Undergraduate Teaching Assistant, APMA 0330: Methods of Applied Mathematics I, Brown University — 2017

COMMUNITY AND OUTREACH ACTIVITIES

Volunteer with Neurosci Community Outreach Group (NCOG), UW Biology Open House — 2026

Contributor to Tuthill Lab "Illuminating Circuits" table, UW Brain Awareness Open House — 2026

Volunteer with NCOG, Echo Lake Science Night — 2025

Graduate Student Editor, Grey Matters Journal — 2023–*present*

Volunteer, Issaquah High School AP Psychology Center for Neurotechnology Visit — 2025

DIY Science Zone volunteer, GeekGirlCon — 2024, 2025

PacSci BrainFest volunteer, Pacific Science Center — 2024, 2025

"Record Electricity from Your Muscles!" workshop co-presenter, Expanding Your Horizons (EYH) Conference at Edmonds College — 2024, 2025

Volunteer with NCOG, STEM Pals STEM Expo — 2024

Co-organizer and contributor, UW Brain Awareness Open House — 2024

Volunteer with NCOG, STEAM Night at Woodside Elementary School — 2023

Panelist, UW CoNECT Open House — 2023

Neuroanatomy station volunteer, Doctor for a Day Neurosurgery/Neurology Workshop — 2023

Head coordinator, Brown Brain Bee — 2018–2020

Publicity coordinator, Brown Brain Bee — 2017–2018

Mentor, Brown Elementary Afterschool Mentoring (BEAM) Program 2016

SERVICE

Graduate Student Representative, UW Department of Neurobiology and Biophysics (NBIO) 2024–*present*
Seminar Committee, UW Graduate Program in Neuroscience 2022–2025