Connor Brennan

Redwood City, California
sharsnik@gmail.com
con-bren.github.io/website/
con-bren

Education

2016–2022 **PhD (Neuroscience)**, *University of Pennsylvania*, Philadelphia, PA.
- PI: Alex Proekt

2016–2018 **MS (Neuroscience)**, *University of Pennsylvania*, Philadelphia, PA.
- PI: Alex Proekt

2014–2016 **BS (Physics)**, *University of Washington*, Seattle, WA.

2009–2010 **Information-Technology Engineers Examination**, *HAL Tokyo College of Technology and Design*, Tokyo, Japan.

Publications

2023 **One dimensional approximations of neuronal dynamics reveal computational strategy**, *C Brennan, A Aggarwal, R Pei, D Sussillo, A Proekt*, PLOS Computational Biology.

2023 **Attractor dynamics with activity-dependent plasticity capture human working memory across time scales**, *C Brennan, A Proekt*, Communications Psychology.

2023 **A neural signature of social support mitigates negative emotion**, *R Pei, AL Courtney, I Ferguson, C Brennan, J Zaki*, Scientific Reports.

2022 **Visual evoked feedforward–feedback traveling waves organize neural activity across the cortical hierarchy in mice**, *A Aggarwal, C Brennan, J Luo, H Chung, D Contreras, MB Kelz, A Proekt*, Nature Communications.

2020 **LOOPER: Inferring computational algorithms enacted by neuronal population dynamics**, *C Brennan, A Proekt*, arXiv preprint arXiv:.

2019 **Duration of EEG suppression does not predict recovery time or degree of cognitive impairment after general anaesthesia in human volunteers**, *BP Shortal, LB Hickman, RA Mak-McCully, W Wang, C Brennan, H Ung, ...*, British journal of anaesthesia.

2019 **A quantitative model of conserved macroscopic dynamics predicts future motor commands**, *C Brennan, A Proekt*, Elife.

2019 **Coherence of visual-evoked gamma oscillations is disrupted by propofol but preserved under equipotent doses of isoflurane**, *A Aggarwal, C Brennan, B Shortal, D Contreras, MB Kelz, A Proekt*, Frontiers in systems neuroscience.

2019 **ReCCognition Study Group: Duration of EEG suppression does not predict recovery time or degree of cognitive impairment after general anaesthesia in human volunteers**, *BP Shortal, LB Hickman, RA Mak-McCully, W Wang, C Brennan, H Ung, ...*, Br J Anaesth.

2018 **A Model of Conserved Global Neuronal Dynamics Predicts Future Behaviors in Caenorhabditis Elegans**, *C Brennan, A Proekt*, Available at SSRN.

2017 **Universality of macroscopic neuronal dynamics in Caenorhabditis elegans**, *C Brennan, A Proekt*, arXiv preprint arXiv:.

2016 **SuperSegger: robust image segmentation, analysis and lineage tracking of bacterial cells**, *S Stylianidou, C Brennan, SB Nissen, NJ Kuwada, PA Wiggins*, Molecular microbiology.

Research Experience

2022–Present **Postdoctoral Researcher**, *Mila*, Montreal, Quebec.
- Led a team training language and vision models with billions of parameters on high performance computing cluster
- Developed large-scale reinforcement learning architecture for training adaptive agents
- Created customizable procedurally generated 3D environments for reinforcement learning

2016–2022 **Research fellow**, *Proekt Lab*, Philadelphia, PA.
- Developing methods for predicting future timing of behavior switches based on calcium imaging in C. elegans
- Developing methods to model dynamics of biological and artificial networks
- Assisting with electrophysiological recordings in mouse
- Building machine learning algorithms for decoding neuronal data

2016 **Laboratory Technician**, *Wiggin's Biophysics Lab*, Seattle, WA.
- In charge of computer and network maintenance, laboratory upkeep, ordering and maintaining laboratory supplies and equipment

2015 **Undergraduate Research Assistant**, *Wiggin's Biophysics Lab*, Seattle, WA.
- Wrote a massively parallel graphics processing unit based Escherichia coli simulator for modeling the MinE/MinD interaction
- Worked my own project detailing the dynamics of F-Plasmid conjugation in E. coli
- Assisted in a project on E. coli cytoplasmic dynamics
- Several in-lab presentations on my work

Teaching Experience

2019–2020 **Graduate Teaching Assistant**, *University of Pennsylvania*, Philadelphia, PA.
- PHYS 585/ BE 530 Theoretical and Computational Neuroscience
- Ran office hours, advised students and wrote a machine learning based homework assignment

2016 **Instructor**, *iD Tech*, Villanova, PA.
- Worked with high school children teaching C++, Arduino and game design

2008–2009 **Undergraduate Teaching Assistant**, *Edmonds Community College*, Edmonds, WA.
- Worked with a class of Japanese students studying english

Grants

Aug 2020 **Google PhD Fellowship**.
- Up to three years of tuition and $35,000 stipend.

Presentations

Research Talks

Apr 2020 **LOOPER: Modeling neuronal dynamics**, *Mahoney Institute for Neuroscience "Year of Brain Science Technology"*, Philadelphia, PA (Online).

Mar 2020 **LOOPER: Modeling neuronal dynamics**, *Invited speaker for Stephen's Lab*, Amsterdam, Netherlands (Online).

Posters

Feb 2020 **LOOPER: A tool for the semi-supervised extraction of behaviorally relevant dynamics from observations of neural data.**, *Cosyne 2020*, Denver, CO.

Nov 2017 **Topologically invariant manifolds of C. elegans pan-neuronal activity.**, *Society for Neuroscience*, Washington, D.C.

Aug 2017 **Topologically invariant manifolds of C. elegans pan-neuronal activity.**, *Philadelphia Chapter of Society for Neuroscience*, Philadelphia, PA.

Industry experience

2012–2015 **Project Leader/Owner**, *Fractal Entertainment*, Edmonds, WA.

- Team leader, business manager and lead programmer
- Worked with a team of full time employees and contract workers
- Dealt with all aspects of business: financials, product design, workflow, marketing and team communication

2011–2012 **Software Engineer**, *Polygon Magic*, Tokyo, Japan.

- Helped build and maintain a multi-million dollar game Sengoku Kingdom
- Entrusted with several key game systems to implement and maintain with autonomy
- Heavy use of PHP, MySQL and HTML
- Worked and communicated entirely in Japanese