Shiva Farashahi

Curriculum Vitae
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Flatiron Institute,
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EMPLOYMENT

Flatiron Research Fellow — 10/2019-present
Flatiron Institute, Simons Foundation, NY, USA

EDUCATION

Ph.D. in Psychological and Brain Sciences — 9/2014-8/2019
Department of Psychological and Brain Sciences, Dartmouth College, NH, USA

M.S. in Biomedical Engineering — 9/2011-6/2013
School of ECE, University of Tehran, Tehran, Iran

B.S. in Control systems Engineering — 9/2007-9/2011
Department of EE, Ferdowsi University of Mashhad, Khorasan, Iran

OTHER TRAINING

Summer Workshop on the Dynamic Brain — 8/2019-9/2019
Friday Harbor Laboratory, WA, USA

Methods in Computational Neuroscience course — 7/2018-8/2018
Marine Biology Laboratory, MA, USA

PUBLICATIONS **Peer-reviewed Publications**

10. **Farashahi S**†, Soltani A†(2021). Computational mechanisms of distributed value representations and mixed learning strategies, *Nature Communications*, 12, 7191.
9. Friedrich J, Golkar S, **Farashahi S**, Genkin A, Sengupta AM, Chklovskii D†(2021). Neural optimal feedback control with local learning rules. *Advances in Neural Information Processing Systems*, 34.
8. **Farashahi S***, Xu J*, Wu SW, Soltani A†(2020). Learning arbitrary stimulus-reward associations for naturalistic stimuli involves transition from learning about features to learning about objects. *Cognition*, 205, 104425.
7. **Farashahi S**, Donahue C, Hayden B, Lee D, Soltani A†(2019) Flexible combination of reward information across primates. *Nature human behaviour*, 3(11), 1215-1224.
6. **Farashahi S**, Azab H, Hayden B, Soltani A†(2018). On the flexibility of basic risk attitudes in monkeys. *Journal of Neuroscience*, 38(18), 4383-4398.
5. **Farashahi S**, Ting CC, Kao CH, Wu SW, Soltani A†(2018) Dynamic combination of sensory and reward information under time pressure. *PLOS Computational Biology*, 14(3):e1006070.
4. **Farashahi S**, Rowe K, Aslami Z, Gobbini MI, Soltani A†(2018). Influence of learning strategy on response time during complex value-based learning and choice. *PLOS ONE*, 13(5):e0197263.
3. **Farashahi S***, Rowe K*, Aslami Z, Lee D, Soltani A†(2017). Feature-based learning improves adaptability without compromising precision. *Nature Communications*, 8(1), 1-16.
2. **Farashahi S**, Seo H, Donahue C, Khorsand P, Lee D, Soltani A†(2017). Metaplasticity as a neural substrate for adaptive learning and choice under uncertainty. *Neuron*, 94(2), 401-414.
1. Soltani A†, Khorsand P, Guo CZ, **Farashahi S**, Liu J (2016). Neural Substrates of Cognitive Biases during Probabilistic Inference. *Nature Communications*, 7(1), 1-14.

* Equal contributions
† Corresponding author

Book Chapters

1. Bahrami F, **Farashahi S** (2017), How Do We Navigate Our Way to Places?. *Computational Models of Brain and Behavior*, 357-372.

Manuscripts under Review and in Preparation

5. Kashalikar A, **Farashahi S**, Lipshutz D†(In prep.). A linear discriminant analysis model of associative learning in the insect mushroom body.
4. **Farashahi S***, Saleki S*, Wu SW, Soltani A†(In prep.). Neural correlates of learning strategies in non-generalizable multi-dimensional environments.
3. **Farashahi S**†, Soltani A (In prep.). A circuit mechanism for adjustments of learning to uncertainty in reward environment.
2. Taleb F*, **Farashahi S***, Izquierdo A, Soltani A†(In prep.). A circuit level model of reward learning under uncertainty.
1. Qin S, **Farashahi S***, Lipshutz D*, Sengupta A, Chklovskii D, Pehlevan C†(Under review). Coordinated drift of receptive fields during noisy representation learning.

SELECTED CONFERENCE POSTERS

10. **Farashahi S**, Soltani A. Neural mechanisms of distributed value representations and learning strategies, Bernstein, Sep 21-23, 2021.
9. Qin S, **Farashahi S***, Lipshutz D*, Sengupta A, Chklovskii D, Pehlevan C. Dynamics of drifting receptive fields during noisy representation learning, Bernstein, Sep 21-23, 2021.
8. Lipshutz D*, **Farashahi S***, Sengupta A, Chklovskii D. Simple neural network models exhibit representational drift, CoSyNe, Feb 24-26, 2021.
7. **Farashahi S**, Xu J, Soltani A. Emergence of distributed value representations and learning in naturalistic environments, SfN, Jan 11-13, 2021.
6. **Farashahi S**, Nomof V, Aslami Z, Soltani A, Learning from reward feedback in high-dimensional environments, SfN, San Diego, USA, Nov 3-7, 2018.
5. **Farashahi S**, Rowe K, Aslami Z, Lee D, Soltani A, Removing the curse of dimensionality: a trade-off between adaptability and precision, SfN, San Diego, USA, Oct 12-16, 2016.
4. P. Khorsand, **Farashahi S**, Soltani A, Adaptability-precision trade off: a metaplasticity study, SfN, San Diego, USA, Oct 12-16, 2016.
3. **Farashahi S**, Rowe K, Aslami Z, Lee D, Soltani A, Removing the curse of dimensionality: a trade-off between adaptability and precision, SfN, San Diego, USA, Oct 12-16, 2016.
2. **Farashahi S**, Rowe K, Aslami Z, Lee D, Soltani A, Hierarchical selection, reward-dependent metaplasticity, and choice under uncertainty, CoSyNe, Salt Lake City, USA, Feb 25-28, 2016.
1. **Farashahi S**, Seo H, Lee D, Soltani A, Metaplasticity and choice under uncertainty, CoSyNe, Salt Lake City, USA, Mar 4-8, 2015.

INVITED TALKS

Department of Biomedical Engineering, Boston University, MA	1/2022
Department of Neurobiology and Behavior, Cornell University, NY	12/2021
Department of Psychological Sciences, Purdue University, IN	12/2021
Center for Neuroscience, UC Davis, CA	2/2021
Department of Neural Science, NYU Shanghai, CN	2/2021
Shenhav Lab, Brown University, RI	11/2020
National Institute of Mental Health (NIMH), MD	10/2020
Center for Neural Science, NYU, NY	11/2019
Center for Neural Science, NYU, NY	11/2018
Wang Lab, NYU, NY	10/2018
Methods in Neuroscience at Dartmouth, Dartmouth, NH	10/2017
Society for Neuroscience (SfN), Nano-Symposium, IL	10/2015

SERVICE

Ad-hoc reviewing service

eLife, Philosophical Transactions of the Royal Society B, Cognitive Affective and Behavioral Neuroscience, Scientific Reports, NeuroImage, PLOS Computational Biology, PLOS One, CoSyNe conference

RESEARCH EXPERIENCE

Machine/Statistical Learning: Regression, Generalized Linear Mixed Effects, Bayesian Statistics, Reinforcement Learning, Deep Learning, Clustering, Dimension Reduction

Optimization Methods: Genetic Algorithm, Particle Swarm Optimization, Ant Colony Optimization, Game theory, ANFIS

Computational Neuroscience: Biological neural modeling, Generalized linear models of neural spike data, fMRI data analysis, eye-tracking hardware and software (EyeLink)

PROGRAMMING SKILLS

C/C++, Python, R, MATLAB, Bash
Neuron, XPPAUT
psychtoolbox
PSpice, LABVIEW, Protel, Proteus, ORCAD, CodeVision AVR, Bascom AVR

HONORS AND AWARDS

William M. Smith Promise Award in the Brain Sciences, Dartmouth College	6/2019
Marie A. Center Award for Excellence in Research, Dartmouth College	6/2018
Neukom prize for outstanding graduate research, Dartmouth College	6/2017
Neukom travel grant to present at the SfN, Dartmouth College	5/2015-2017
Graduate Fellowship grant, Dartmouth College	09/2014-09/2019
Merit abstract award at 21st Iranian Conf. Electrical Engineering, ICEE	5/2013

TEACHING EXPERIENCE

Teaching Assistant

Experimental Design and Methodology (Dartmouth College)	Fall 2017
Systems Neuroscience with Laboratory (Dartmouth College)	Spring 2016
Introduction to Neuroscience (Dartmouth College)	Winter 2015
Probability and Statistics (Washington State University)	Spring 2014
Dynamical Systems in Neuroscience (University of Tehran)	Spring 2013

Student Advising

Farzaneh Taleb (Master's thesis, University of Tehran)	Fall 2020
Jane Xu (WISP*, Dartmouth College)	Fall 2018
May Nguyen (Honors thesis, Dartmouth College)	Spring 2018
Zohra Aslami (WISP, Dartmouth College)	Fall 2017
Emily Chu (WISP, Dartmouth College)	Fall 2016
Katherine Rowe (WISP and Honors thesis, Dartmouth College)	Fall 2015-Spring 2016

*WISP: Women in Science Program