

# Shiva Farashahi

Curriculum Vitae

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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 Manuscripts under Review and in Preparation

6. **Farashahi S\***, Saleki S\*, Wu SW, Soltani A†(In prep.). Neural correlates of learning strategies in non-generalizable multi-dimensional environments.
5. **Farashahi S†**, Soltani A (In prep.). A circuit mechanism for adjustments of learning to uncertainty in reward environment.
4. Taleb F\*, **Farashahi S\***, Izquierdo A, Soltani A†(In prep.). A circuit level model of reward learning under uncertainty.
3. Qin S, **Farashahi S\***, Lipshutz D\*, Sengupta A, Chklovskii D, Pehlevan C†(Submitted). Coordinated drift of receptive fields during noisy representation learning.
2. Friedrich J, Golkar S, **Farashahi S**, Genkin A, Sengupta AM, Chklovskii D†(Submitted). Neural optimal feedback control with local learning rules.
1. **Farashahi S†**, Soltani A†(Under revision). Neural mechanisms of distributed value representations and learning strategies.

## Peer-reviewed Publications

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.

### SELECTED CONFERENCE POSTERS

17. **Farashahi S**, Soltani A. Neural mechanisms of distributed value representations and learning strategies, Bernstein, Sep 21-23, 2021.
16. 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.
15. Saleki S\*, **Farashahi S\***, Soltani A. Neural correlates of learning strategies in non-generalizable multi-dimensional environments, OHBM, June 21-25, 2021.
14. Lipshutz D\*, **Farashahi S\***, Sengupta A, Chklovskii D. Simple neural network models exhibit representational drift, CoSyNe, Feb 24-26, 2021.
13. **Farashahi S**, Xu J, Soltani A. Emergence of distributed value representations and learning in naturalistic environments, SfN, Jan 11-13, 2021.
12. **Farashahi S**, Donahue C, Hayden B, Lee D, Soltani A, Flexible combination of reward information during choice under uncertainty, SNE, Dublin, Ireland, Oct 4-6, 2019.
11. **Farashahi S**, Nomof V, Aslami Z, Soltani A, Learning from reward feedback in high-dimensional environments, SfN, San Diego, USA, Nov 3-7, 2018.
10. Soltani A, **Farashahi S**, Izquierdo A, Circuit-level model of reward learning under uncertainty, SNE, Philadelphia, USA, Oct 5-7, 2018.
9. **Farashahi S**, Nomof V, Aslami Z, Soltani A, Learning from reward feedback in high-dimensional environments, SNE, Philadelphia, USA, Oct 5-7, 2018.
8. **Farashahi S**, Rowe K, Aslami Z, Gobbini MI, Soltani A, Pattern of response time reveals the construction of reward value during adaptive learning and choice, SfN, Washington DC, USA, Nov 11-15, 2017.
7. **Farashahi S**, Azab H, Hayden B, Soltani A, On the flexibility of basic risk attitudes in monkeys, SNE, Toronto, CA, Oct 6-8, 2017.
6. **Farashahi S**, Rowe K, Aslami Z, Gobbini MI, Soltani A, Pattern of response time reveals the construction of reward value during adaptive learning and choice, SNE, Toronto, CA, Oct 6-8, 2017.
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.

<b>INVITED TALKS</b>	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
<b>SERVICE</b>	<b>Ad-hoc reviewing service</b>	
	eLife, Philosophical Transactions of the Royal Society B, Scientific Reports, PLOS One, NeuroImage, PLOS Computational Biology, CoSyNe conference	
<b>RESEARCH EXPERIENCE</b>	<b>Machine/Statistical Learning:</b> Regression, Generalized Linear Mixed Effects, Bayesian Statistics, Reinforcement Learning, Deep Learning, Clustering, Dimension Reduction	
	<b>Optimization Methods:</b> Genetic Algorithm, Particle Swarm Optimization, Ant Colony Optimization, Game theory, ANFIS	
	<b>Computational Neuroscience:</b> Biological neural modeling, Generalized linear models of neural spike data, fMRI data analysis, eye-tracking hardware and software (EyeLink)	
<b>PROGRAMMING SKILLS</b>	C/C++, Python, R, MATLAB, Bash	
	Neuron, XPPAUT	
	psychtoolbox	
	Pspice, LABVIEW, Protel, Proteus, ORCAD, CodeVision AVR, Bascom AVR	
<b>HONORS AND AWARDS</b>	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
<b>TEACHING EXPERIENCE</b>	<b>Teaching Assistant</b>	
	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
	<b>Student Advising</b>	
	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	