

# 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

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

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

## **PUBLICATIONS Manuscripts under Review and in Preparation**

2. **Farashahi S**<sup>†</sup>, Xu J, Soltani A<sup>†</sup>(in preparation). Emergence of distributed value representations and learning in naturalist environments.
1. Soltani A<sup>†</sup>, **Farashahi S**, Izquierdo A (in preparation). A circuit level model of reward learning under uncertainty.

### **Peer-reviewed Publications**

8. **Farashahi S**<sup>\*</sup>, Xu J<sup>\*</sup>, Wu SW, Soltani A<sup>†</sup>(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<sup>†</sup>(2019) Flexible combination of reward information across primates. *Nature human behaviour*, 3(11), 1215-1224.
6. **Farashahi S**, Azab H, Hayden B, Soltani A<sup>†</sup>(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<sup>†</sup>(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<sup>†</sup>(2018). Influence of learning strategy on response time during complex value-based learning and choice. *PLOS ONE*, 13(5):e0197263.
3. **Farashahi S**<sup>\*</sup>, Rowe K<sup>\*</sup>, Aslami Z, Lee D, Soltani A<sup>†</sup>(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<sup>†</sup>(2017). Metaplasticity as a neural substrate for adaptive learning and choice under uncertainty. *Neuron*, 94(2), 401-414.
1. Soltani A<sup>†</sup>, 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

<sup>†</sup> 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.

## CONFERENCE POSTERS

20. Lipshutz D, **Farashahi S**, Sengupta A, Chklovskii D. Simple neural network models exhibit representational drift, CoSyNe, Feb 24-26, 2021.
19. **Farashahi S**, Xu J, Soltani A. Emergence of distributed value representations and learning in naturalistic environments, SfN, Jan 11-13, 2021.
18. **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.
17. **Farashahi S**, Nomof V, Aslami Z, Soltani A, Learning from reward feedback in high-dimensional environments, SfN, San Diego, USA, Nov 3-7, 2018.
16. Soltani A, **Farashahi S**, Izquierdo A, Circuit-level model of reward learning under uncertainty, SNE, Philadelphia, USA, Oct 5-7, 2018.
15. **Farashahi S**, Nomof V, Aslami Z, Soltani A, Learning from reward feedback in high-dimensional environments, SNE, Philadelphia, USA, Oct 5-7, 2018.
14. **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.
13. **Farashahi S**, Azab H, Hayden B, Soltani A, On the flexibility of basic risk attitudes in monkeys, SNE, Toronto, CA, Oct 6-8, 2017.
12. **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.
11. **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.
10. P. Khorsand, **Farashahi S**, Soltani A, Adaptability-precision trade off: a metaplasticity study, SfN, San Diego, USA, Oct 12-16, 2016.
9. **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.
8. **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.
7. Chu E, Harris L, Lee V, **Farashahi S**, Soltani A, Influence of value-dependent endogenous signals on saccadic choice, SfN, Chicago, USA, Oct 17-21, 2015.
6. **Farashahi S**, Seo H, Lee D, Soltani A, Metaplasticity and choice under uncertainty, CoSyNe, Salt Lake City, USA, Mar 4-8, 2015.
5. Mohammadi M, **Farashahi S**, Mahdavi A, Bahrami F, Allocentric Spatial Navigation Impairment in Schizophrenic Subject: A Model-based Study, ICEE, Tehran, Iran, May 10-14, 2015.
4. **Ghaani S**, Lienard J, Ingram S, Dimitrov A, Model of dynamics of intracellular chloride based on fluorescent imaging, CNS, Quebec City, Canada, Jul 26-31, 2014.
3. **Ghaani-Farashahi S**, Bahrami F, Modeling Alzheimer's disease deficits in place field representation, ICIS, Tehran, Iran, Feb 26-28, 2013.
2. **Ghaani-Farashahi S**, Bahrami F, Does Deficits in Place Field Formation Cause Spatial Navigation Impairment in Alzheimer's Disease?, ICBME, Tehran, Iran, Dec 18-20, 2013.
1. **Ghaani-Farashahi S**, Bahrami F, Modeling place field formation considering recurrent connections in CA3 and STDP, ICEE, Mashhad, Iran, May 14-16, 2013.

<b>INVITED TALKS</b>	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>Reviewing service</b>	
	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 Marie A. Center Award for Excellence in Research, Dartmouth College Neukom prize for outstanding graduate research, Dartmouth College Neukom travel grant to present at the SfN, Dartmouth College Graduate Fellowship grant, Dartmouth College Merit abstract award at 21st Iranian Conf. Electrical Engineering, ICEE	6/2019 6/2018 6/2017 5/2015-2017 09/2014-09/2019 5/2013
<b>TEACHING EXPERIENCE</b>	<b>Teaching Assistant</b> Experimental Design and Methodology (Dartmouth College) Systems Neuroscience with Laboratory (Dartmouth College) Introduction to Neuroscience (Dartmouth College) Probability and Statistics (Washington State University) Dynamical Systems in Neuroscience (University of Tehran)	
	<b>Student Advising</b> Jane Xu (WISP*, Dartmouth College) May Nguyen (Honors thesis, Dartmouth College) Zohra Aslami (WISP, Dartmouth College) Emily Chu (WISP, Dartmouth College) Katherine Rowe (WISP and Honors thesis, Dartmouth College) Farzaneh Taleb (Master's thesis, University of Tehran)	
		Fall 2017 Spring 2016 Winter 2015 Spring 2014 Spring 2013  Fall 2018 Spring 2018 Fall 2017 Fall 2016 Fall 2015-Spring 2016 Fall 2020
	*WISP: Women in Science Program	