Shiva FARASHAHI, Ph.D.

Data Science | Machine Learning

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I am a highly driven scientist, with 7+ years of applying statistical and machine learning tools in academic settings. Proficient in statistical analysis of large datasets, applying machine learning and model-driven approaches, as well as scripting languages including Python.

EMPLOYEMENT

10/2019-present Flatiron Research Fellow
Center for Computational Neuroscience, Flatiron Institute, NY, USA

EDUCATION

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

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

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

DATA ANALYTICS SKILLS

Programming	Python, Pandas, Scikit-Learn, SciPy, NumPy, TensorFlow, SQL, MATLAB
Machine/Statistical Learning	Regression, Classification, Clustering, Latent variable/Dimensionality reduction models, Ensemble methods, Reinforcement Learning, Deep Learning, Time-series analysis
Additional	Study design and measurement (Power analysis, A/B testing, Experimental design), Biophysical modeling of brain dynamics, Human behavioral modeling

PROJECTS

Noisy sensory representation learning

I explored how a biologically plausible neural network, driven from normative approaches, can explain 'representational drift', a recently observed neurological phenomena in the sensory areas of the brain.

Reward representation learning

I developed a Reinforcement Learning model, as well as a biologically inspired Recurrent Neural Network (RNN) model to investigate the neural mechanisms underlying reward representation learning.

Neural basis of adaptive learning

Using various statistical and machine learning tools, I explored large neural recordings and behavioral data collected in humans and non-human primates during a learning task.

PUBLICATIONS (Citations ~ 290)

9. **Farashahi S**, Soltani A (2021). Computational mechanisms of distributed value representations and mixed learning strategies, *Nature Communications*, 12, 7191.

8. 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.

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, Lee D, Soltani A (2017). Feature-based learning improves adaptability without compromising precision. *Nature Communications*, 8(1), 1-16.

3. **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.

2. Bahrami F, **Farashahi S** (2017), How do we navigate our way to places?. *Computational Models of Brain and Behavior*, 357-372.

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.

HONORS AND AWARDS

6/2019	William M. Smith Promise Award in the Brain Sciences
6/2018	Marie A. Center Award for Excellence in Research
6/2017	Neukom Prize for Outstanding Graduate Research in Computational Science
5/2017	Neukom travel grant to present at the SfN, Dartmouth College
5/2013	Merit Abstract Award at 21st Iranian Conf. Electrical Engineering, ICEE

REFERENCES

Dmitri 'Mitya' Chklovskii, Ph.D.
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