# Shiva FARASHAHI, Ph.D.

Machine Learning | Data Science

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I am a Machine learning Engineer, with 9+ years of applying machine learning tools in academic and industry settings. Proficient in statistical analysis of large datasets, applying machine learning and model-driven approaches, as well as scripting languages including Python.

## EMPLOYMENT

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|---|---|
| **1/2024-present** | Associate Principal, Machine Learning |
| **6/2022-1/2024** | Senior Machine Learning Engineer<br>Harbinger Health, Flagship Pioneering, MA, USA |
| **10/2019-6/2022** | Flatiron Research Fellow<br>Center for Computational Neuroscience, Flatiron Institute, NY, USA |

## EDUCATION

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|---|---|
| **9/2014-8/2019** | Ph.D. in Computational Neuroscience<br>Department of Psychological and Brain Sciences, Dartmouth College, NH, USA |
| **9/2011-6/2013** | M.S. in Biomedical Engineering<br>School of ECE, University of Tehran, Tehran, Iran |
| **9/2007-9/2011** | B.S. in Control systems Engineering<br>Department of EE, Ferdowsi University of Mashhad, Khorasan, Iran |

## PROFESSIONAL SKILLS

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| **Programming** | Python, Pandas, Scikit-Learn, SciPy, NumPy, TensorFlow, PyTorch, MLFlow, SQL |
| **Machine Learning** | Regression, Classification, Clustering, Latent variable/Dimensionality reduction models, Ensemble methods, Reinforcement Learning, Convolutional Neural Networks, Transformer models, Time-series analysis |
| **Additional** | Amazon AWS, Study design and measurement (Power analysis, A/B testing, Experimental design), Biophysical modeling of brain dynamics |

## PROFESSIONAL EXPERIENCE

**Harbinger Health,** *Associate Principle, Machine Learning*

- Developed Recurrent Neural Network and Transformer models tailored for methylation-based cancer detection at the CpG-sites and read level.
- Collaborated in design and implementation of Transfer learning models for pan-cancer classification.
- Developed a robust data augmentation method to enhance generalization of ML models.
- Established end-to-end ML pipeline to enable tracking, training, and deploying of models at scale.
- *Tools:* Python, PyTorch, TensorFlow, Transformers, Convolutional Neural Networks, Transfer Learning, Hierarchical Classification, MLFlow, AWS SageMaker.

**Flatiron Institute,** *Flatiron Research Fellow*

- Analyzed large neural recordings and behavioral data to investigate continual learning in rodents.
- Investigated stability of learned representations in a biologically plausible Neural Network during noisy continual learning.
- *Tools*: Python, SciPy, NumPy, Time-series analysis.

**Dartmouth College,** *Ph.D. Computational Neuroscience*

- Developed a meta-learning Reinforcement Learning agent and explored its behavior in various tasks.
- Designed a Recurrent Neural Network based Reinforcement Learning agent to explore adaptation of generalizable representations.
- *Tools*: Python, TensorFlow, Reinforcement Learning, Latent variable models, Study design.

## SELECTED PUBLICATIONS

8. Qin S, **Farashahi S**, Lipshutz D, Sengupta A, Chklovskii D, Pehlevan C (2023). Coordinated drift of receptive fields in Hebbian/anti-Hebbian network models during noisy representation learning. *Nature Neuroscience*, 1-11.
7. **Farashahi S**, Soltani A (2021). Computational mechanisms of distributed value representations and mixed learning strategies, *Nature Communications*, 12, 7191.
6. Friedrich J, Golkar S, **Farashahi S**, Genkin A, Sengupta A, Chklovskii D (2021). Neural optimal feedback control with local learning rules. *Advances in Neural Information Processing Systems*, 34.
5. **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.
4. **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.
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 C, **Farashahi S**, Liu J (2016). Neural Substrates of Cognitive Biases during Probabilistic Inference. *Nature Communications*, 7(1), 1-14.