Exponent®
Engineering & Scientific Consulting

Amir Akbarian, Ph.D.

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Professional Profile

Dr. Amir Akbarian specializes in designing studies focused on user research and human machine interaction. His area of expertise lies in the intersection of artificial intelligence, data sciences, and systems neuroscience.

He specializes in developing machine learning-based algorithms and models to solve complex interdisciplinary problems faced in the development of emerging technologies with the goal of understanding the interaction between the brain's oscillatory and spiking activity so that it can be used by the visual system toward building a stable perception of the world; areas of focus include sensory and motor prostheses, autonomous driving, wearable consumer electronics, and therapeutic neural interfaces. He has extensive experience in developing data pipelines and models using various types of data including physiological signals, images, text, videos, OMICs data, and medical digital records.

Prior to joining Exponent, Dr. Akbarian worked as a computational neuroscientist in the Ophthalmology & Visual Sciences and Electrical Engineering Departments of the University of Utah in Salt Lake City, Utah, while pursuing his Ph.D., as well as post-doc. His research has focused on the stability of visual perception during eye movements and the dynamics of the sensory information encoding in the neural activity of the brain and he has designed electrophysiology experiments to record data from the visual cortex of the brain in awake-behaving macaque monkeys. His research resulted in the discovery of a novel sensory memory in the early visual system contributing to the stability of visual perception.

Academic Credentials & Professional Honors

Ph.D., Electrical and Computer Engineering, University of Utah, 2020

M.Sc., Biomedical Engineering, Sharif University of Technology, Iran, 2014

B.Sc., Electrical and Computer Engineering, Sharif University of Technology, Iran, 2011

Kirschstein Institutional National Research Service Award (NRSA), UT, US

Benjamin Ph.D. Fellowship award by the state of Montana, MT, US

Kirschstein Institutional National Research Service Award, UT, US, Jul 2022

Benjamin PhD Fellowship award by the state of Montana, MT, US, Sep 2014

Prior Experience

Postdoctoral Research Associate, Moran Eye Center, University of Utah, Salt Lake City, UT. 2019-2022.

Graduate Research Assistant, Department of Electrical and Computer Engineering, University of Utah, Salt Lake City, UT. 2017-2019.

Graduate Research Assistant, Department of Electrical and Computer Engineering, Montana State University, Bozeman, MT. 2014-2017.

Professional Affiliations

Society for Neuroscience (SfN)

Institute of Electrical and Electronics Engineers (IEEE)

Publications

Lim, T., Kim, M., Akbarian, A., Kim, J., Tresco, P. A., & Zhang, H. (2022). Conductive polymer enabled biostable liquid metal electrodes for bioelectronic applications. Advanced Healthcare Materials, 2102382.

Lim, T., Kim, M., Akbarian, A., Kim, J., Tresco, P. A., & Zhang, H. (2022). Conductive polymer enabled biostable liquid metal electrodes for bioelectronic applications. Advanced Healthcare Materials, 2102382.

Niknam, K., Akbarian, A., Clark, K., Zamani, Y., Noudoost, B., & Nategh, N. (2019). Characterizing and dissociating multiple time-varying modulatory computations influencing neuronal activity. PLoS computational biology, 15(9), e1007275.

Lim, T., Kim, M., Akbarian, A., Kim, J., Tresco, P. A., & Zhang, H. (2022). Conductive polymer enabled biostable liquid metal electrodes for bioelectronic applications. Advanced Healthcare Materials, 2102382.

Akbarian, A., Clark, K., Noudoost, B., & Nategh, N. (2021). A sensory memory to preserve visual representations across eye movements. Nature communications, 12(1), 1-9.

Roy, M., Akbarian, A., Noudoost, B., & Nategh, N. (2020, November). The Population Map of Changes in the Spatiotemporal Sensitivity of Visual Neurons Across Saccadic Eye Movements. In 2020 54th Asilomar Conference on Signals, Systems, and Computers (pp. 97-100). IEEE.

Niknam, K., Akbarian, A., Clark, K., Zamani, Y., Noudoost, B., & Nategh, N. (2019). Characterizing and dissociating multiple time-varying modulatory computations influencing neuronal activity. PLoS computational biology, 15(9), e1007275.

Niknam, K., Akbarian, A., Noudoost, B., & Nategh, N. (2018, November). Characterizing unobserved factors driving local field potential dynamics underlying a time-varying spike generation. In 2018 IEEE Global Conference on Signal and Information Processing (GlobalSIP) (pp. 464-468). IEEE.

Niknam, K., Akbarian, A., Noudoost, B., & Nategh, N. (2018, June). A Neuro-Inspired Model for Image Motion Processing. In Computational Optical Sensing and Imaging (pp. CW3B-1). Optica Publishing Group.

Akbarian, A., Niknam, K., Parsa, M., Clark, K., Noudoost, B., & Nategh, N. (2017). Developing a nonstationary computational framework with application to modeling dynamic modulations in neural spiking responses. IEEE Transactions on Biomedical Engineering, 65(2), 241-253.

Niknam, K., Akbarian, A., Noudoost, B., & Nategh, N. (2017, October). Model-based decoding of time-varying visual information during saccadic eye movements using population-level information. In 2017

51st Asilomar Conference on Signals, Systems, and Computers (pp. 1491-1495). IEEE.

Niknam, K., Akbarian, A., Noudoost, B., & Nategh, N. (2017, May). A computational model for characterizing visual information using both spikes and Local Field Potentials. In 2017 8th International IEEE/EMBS Conference on Neural Engineering (NER) (pp. 656-659). IEEE.

Monfared, S. S. M. S., Lashgari, E., Akbarian, A., & Khalaj, B. H. (2013, December). Method as a preprocessing stage for tracking sperms progressive motility. In IEEE International Symposium on Signal Processing and Information Technology (pp. 000170-000174). IEEE.

Presentations

Akbarian, A., Niknam, K., Clark. K., Noudoost B., Nategh N., Tracing the neural basis of integration of spatial information across a saccade in extrastriate visual cortex. Program No. 226.14. 2019 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2019. Online.

Akbarian, A., Niknam, K., Clark. K., Noudoost B., Nategh N., Inferring saccadic modulation sources and their computations using a model-based characterization of spiking responses in extrastriate visual cortex. Program No. 091.06. 2018 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2018. Online.

Akbarian, A., Parsa, M., Clark. K., Noudoost B., Nategh N., MT neurons preserve visually selective signals across eye movements. Program No. 715.01. 2016 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2016. Online.

Akbarian, A., Parsa, M., Clark. K., Noudoost B., Nategh N., Spatiotemporal dynamics of MT receptive fields during eye movements. Program No. 110.06. 2015 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2015. Online.

Akbarian, A., Niknam, K., Parsa, M., Clark, K., Noudoost, B., & Nategh, N. (2017). Developing a nonstationary computational framework with application to modeling dynamic modulations in neural spiking responses. IEEE Transactions on Biomedical Engineering, 65(2), 241-253.

Niknam, K., Akbarian, A., Clark, K., Zamani, Y., Noudoost, B., & Nategh, N. (2019). Characterizing and dissociating multiple time-varying modulatory computations influencing neuronal activity. PLoS computational biology, 15(9), e1007275.

Akbarian, A., Clark, K., Noudoost, B. and Nategh, N., 2021. A sensory memory to preserve visual representations across eye movements. Nature communications, 12(1), pp.1-9.

Research Grants

Kirschstein Institutional National Research Service Award (NRSA), UT, US. (2022)

Benjamin Ph.D. Fellowship award by the state of Montana, MT, US. (2014)

Peer Reviews

Reviewer for Elsevier Neurocomputing journal

Reviewer for Plos One journal

Reviewer for Asilomar Conference