

Atlas Kazemian

COGNITIVE SCIENCE RESEARCHER

Research Experience	2022 - Now	Department of Cognitive Science, Johns Hopkins University Baltimore, MD MA Researcher, advised by Michael Bonner. Reverse engineering the computations and algorithms of human visual cortex using deep neural networks.
	2021 - 2022	Department of Ophthalmology and Visual Sciences, University of British Columbia, Vancouver, BC Research Assistant, advised by Jason Barton and Ipek Oruc. Using deep learning to study the face scanning patterns of patients with Prosopagnosia (face agnosia).
Education	2022 - 2023	Johns Hopkins University MA Cognitive Science
		Thesis: "Predicting visual cortex representations with high dimensional untrained neural networks"
	2021	Lighthouse Labs Diploma Data Science
	2015 - 2020	University of British Columbia BAS Integrated Engineering
Conference Presentations and Posters	2023	Poster © "Predicting visual cortex representations with high dimensional untrained neural networks", Kazemian A., Elmoznino E., Bonner M. Johns Hopkins Al-X Foundry Fall 2023 Symposium
	2023	Keynote Tutorial Presentation 🗗

"A high dimensional view of computational neuroscience", Gauthaman R. M., Kazemian A., Chen Z., Guth F., Bonner M. Conference on Cognitive Computational Neuroscience

2023 **Poster ©**

"High-dimensional sampling in random neural networks competes with deep learning models of visual cortex", Kazemian A., Elmoznino E., Bonner M.

Conference on Cognitive Computational Neuroscience

2023 Talk Presentation

"Toward a computational neuroscience of visual cortex without deep learning", Kazemian A., Elmoznino E., Bonner M. Vision Sciences Society Conference

2022 **Poster** 🗗

"Towards high-performance encoding models of visual cortex using modules of canonical computations", Kazemian A., Elmoznino E., Bonner M.

Conference on Cognitive Computational Neuroscience

2022 **Poster**

"Scanning faces: A deep learning approach to studying the eye movements of subjects with Prosopagnosia", Kazemian A., Oruc I., Barton J.

North American Neuro-Ophthalmology Society Annual Meeting

Work Experience

2021 AdHawk Microsystems. Toronto, ON Data Science Intern

Designed an end-to-end pipeline for predicting mental fatigue based on reading behavior:

- Led the experimental design, data collection and processing, supervised model training and results presentation.
- Developed the first case study for the AdHawk eyetracking glasses, contributing to fund-raising and marketing efforts.

2021 **Neobi**, Calgary, AB **Data Science Intern**

- Extracted online product information from various ecommerce sites to gain insights into the Canadian cannabis market.
- Enhanced web scraping and data processing pipelines, reducing data anomalies.
- Conducted topic modeling and sentiment analysis on online customer reviews, revealing key market trends for clients.

2019 **Entuitive,** Calgary, AB **R&D Intern**

 Automated the pricing workflow for parking renovations by developing models to forecast

parking renovation expenses based on previous data. Resulting in price estimation accuracy.

Projects

2022-Now Modeling visual cortex with high dimensional, learning free

convolutional neural networks 🗗

A family of Convolutional Neural Networks (CNNs) that explain image-evoked neural responses in the primate brain

without pre-training on a computer vision task.

2021-2022 A deep learning approach for studying face scanning in

prosopagnosia 🗗

An ensemble of CNNs to distinguish subjects with

prosopagnosia from healthy controls using their gaze pattern

during a face recognition task.

2022 A proposed neuro-imaging experiment for studying

compositionality in visual perception 🗗

An fMRI experiment proposal for exploring the

compositionality of neural representations during visual

perception of object relations.

2021 Predicting grasp and lift motions using EEG 🗗

A PyTorch project for predicting intended motor movement using EEG data collected from subjects while performing a

series of grasp and lift motions.

2021 Mental state decoder 🗗

A TensorFlow project for predicting mental state using data

collected from a consumer grade EEG headband.

Technical Skills

Programming Python, SQL, C++

Computational Neuroscience fMRI data analysis, dimensionality

reduction techniques, cross-validated regression methods for comparing brain and model representations, eye-tracking

data analysis

Deep Learning PyTorch, TensorFlow

Machine Learning Scikit-learn, Scipy

Data Manipulation and Analysis Torch, Xarray, NumPy, Pandas

Visualization Matplotlib, Seaborn, Plotly

Languages

Native language Farsi

English Advanced Listener, Advanced Speaker, Advanced Reading and Writing