

# Atlas Kazemian

## COGNITIVE SCIENCE RESEARCHER

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### 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).

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### 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**

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### Conference Presentations and Posters

2023





**Poster** 

"Predicting visual cortex representations with high dimensional untrained neural networks", Kazemian A., Elmoznino E., Bonner M.  
*Johns Hopkins AI-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 eye-tracking glasses, contributing to fund-raising and marketing efforts.
- 2021 **Neobi,** Calgary, AB  
**Data Science Intern**
  - Extracted online product information from various e-commerce 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.

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## Projects

2022-Now	<b>Modeling visual cortex with high dimensional, learning free convolutional neural networks</b>  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	<b>A deep learning approach for studying face scanning in prosopagnosia</b>  An ensemble of CNNs to distinguish subjects with prosopagnosia from healthy controls using their gaze pattern during a face recognition task.
2022	<b>A proposed neuro-imaging experiment for studying compositionality in visual perception</b>  An fMRI experiment proposal for exploring the compositionality of neural representations during visual perception of object relations.
2021	<b>Predicting grasp and lift motions using EEG</b>  A PyTorch project for predicting intended motor movement using EEG data collected from subjects while performing a series of grasp and lift motions.
2021	<b>Mental state decoder</b>  A TensorFlow project for predicting mental state using data collected from a consumer grade EEG headband.

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## 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
Software Tools	Git, Jupyter Notebook

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## Languages

Farsi	Native language
English	Advanced Listener, Advanced Speaker, Advanced Reading and Writing