Elaheh Akbari

PhD Candidate, Computational Cognitive Neuroscience

Visual Cognition and Computational Neuroscience Lab
Expected PhD Graduation Date: December 2026
elahakbri@gmail.com | Google Scholar | GitHub | Personal Website | Linkedin

Research Interests

Representational structure and alignment between vision models and human; mechanistic interpretability of vision models; leveraging principles of biological vision to build more robust, fair, and interpretable AI systems.

Education

PhD in Computational Cognitive Neuroscience
Justus Liebig University of Giessen, Germany | 2023-Present
Erasmus+ Exchange (Computational Neuroscience)
Ecole Normale Supérieure, Paris, France | 2021-2022
MSc in Cognitive Neuroscience
Sapienza University, Rome, Italy | 2019-2022
BSc in Chemical Engineering
Amirkabir University of Technology (Polytechnic of Tehran), Tehran, Iran | 2008-2014

Publications & Preprints

- **Akbari, E.**, & Dobs, K. (2025). Distinct Computational Mechanisms Underlie Holistic Processing of Faces and Non-Face Line Patterns. Extended abstract, Conference on Cognitive Computational Neuroscience (CCN).
- **Akbari, E.**, & Dobs, K. (2025). Diverse Visual Experience Promotes Integrated Representations and Mitigates Bias in Deep Neural Networks for Face Perception. bioRxiv. Under revision at Proceedings of the National Academy of Sciences of the United States of America.
- Kollenda, D., **Akbari, E.**, Broda, M.D., de Haas, B. (2025). Active vision is tuned to representational distinctiveness in the individual brain. Preprint on OSF. Under revision at Nature Human Behaviour.
- Bencivenga, F., **Akbari, E.**, Galati, G. (2022). Functional parcellation of the human face-selective areas: a resting-state connectivity homogeneity analysis. Conference abstract, FENS 2022 E-Book of Abstracts.

Research Experiences

Visual Cognition and Computational Neuroscience Lab
Justus Liebig University of Giessen | PhD Researcher | 2023-Present

- **Formulating and pursuing original research questions on representational structure and alignment between vision models and human visual behavior, informed by theoretical analysis and literature.**
- **Developing, Developing, training, and probing computational models of vision (e.g., CNNs), and designing and conducting behavioral experiments with human participants to test hypotheses at the interface of cognitive neuroscience and artificial vision.**
- **Analyzing human behavioral data and model representations using statistical and computational methods, and synthesizing findings into research papers, conference posters, and presentations.**
- **Presenting research outcomes at international conferences and workshops; engaging in feedback discussions with supervisors, collaborators, and interdisciplinary researchers.**

- Supervising and mentoring MSc students by supporting project design, implementation, analysis, and thesis writing.

Brain Imaging Lab

Sapienza University, Rome, Italy | M.Sc. Thesis Researcher | 2021-2022

- Conducted an independent MSc thesis on the functional heterogeneity of face-selective regions in the human ventral visual pathway.
- Developed connectivity fingerprint and dissimilarity analyses from resting-state and task-based fMRI data to study representational homogeneity and functional parcellation in face-selective regions of the visual cortex.

Group for Neural Theory

Ecole Normale Supérieure, Paris, France | Research Intern | 2022

- Independently implemented and explored a Wilson–Cowan–based neural population model to study oscillatory activity in prefrontal cortex during working memory tasks.
- Built a working theoretical understanding of dynamical systems modeling, complemented by in-depth investigation of prefrontal cortex circuitry, to simulate biologically plausible cortical dynamics.

Summer Schools & Advanced Training

Analytical Connectionism, University College London, UK | 2025

- Selective summer school focused on analytical methods for neural-network analysis and connectionist theories of higher-level cognition and psychology.
- Participated in a collaborative research project on biologically plausible learning in vision models, examining how biologically-inspired learning rules and architectures give rise to human-like holistic processing.

Neuromatch Academy, Deep Learning Course | 2022

- Participated in a collaborative project using behavioral data from a 2-back working memory task to train and evaluate reinforcement learning agents, comparing agent behavior with human performance to probe mechanistic similarities.

Bayesian Modeling Workshop, Justus Liebig University of Giessen | Participant | 2024

Grant Application Writing workshop, Justus Liebig University of Giessen | Participant | 2023

Barcelona Summer School For Advanced Modeling of Behavior | Participant | 2023

Machine Learning Crash Course Workshop, University of Genova | Participant | 2022

Neuromatch Academy, Computational Neuroscience Course | Participant | 2020

Teaching & Academic Services

Co-organizer, Large Language Models in Brain Research

Justus Liebig University of Giessen| 2025

Teaching Assistant, Deep Learning in Psychology workshop

Conference of Experimental Psychologists (TeaP), Goethe University Frankfurt | 2025

Teaching Assistant, Computational Neuroscience Course

Neuromatch Academy | 2021

Technical Skills

Python (PyTorch, NumPy, SciPy, Matplotlib, TensorBoard), MATLAB
PsychoPy, Psychtoolbox
fMRI data analysis (SPM, FreeSurfer, MRtrix)
Linux, Git, Jupyter, HPC/Slurm, Docker, LaTeX, Hugging Face