

Gabriel Fajardo

Columbia University,
Department of Psychology
352 Schermerhorn Hall

Website: fajardgb.github.io
E-mail: gjf2118@columbia.edu
Github: github.com/fajardgb

Education

Boston College, Morrissey College of Arts and Sciences
Bachelor of Science, *cum laude*

Chestnut Hill, MA
May 2023

Major: Neuroscience | **Minor:** Mathematics | **GPA:** 3.70/4.00

Research Experience

Columbia University | Social Cognitive & Neural Sciences Lab | *Lab Manager* Aug 2023 - Present
Advisor: **Dr. Jon Freeman**, Associate Professor, Department of Psychology

- Explore the neural basis of categorical & individuated social processing using behavioral paradigms, functional magnetic resonance imaging (fMRI), and multivariate pattern analysis (MVPA)
- Investigate the cognitive and neural relationship between conceptual representations of personality traits and facial stereotypes using fMRI MVPA cross-modal classification
- Challenge contemporary models of facial impressions and expressions by using representative stimuli, computational models, and representational similarity analysis (RSA)
- Implement automated annotation systems for various features, including facial expressions, speech, and identity detection, across 60 hours of naturalistic video clips

Columbia University | Business School | *Summer Intern* May 2023 - July 2023
Advisor: **Dr. Paul Ingram**, Kravis Professor of Business, Management Division

- Analyzed Identity Maps—network representations that provide a comprehensive view of multifaceted identities—to investigate identity concealment, tie formation, and shared identities
- Transformed identity maps into analyzable formats and used word embeddings to examine the stigma and social class associations of identity elements
- Explored factors influencing the concealment of identities, identifying key predictors that increase the likelihood of an identity being hidden

Harvard University | Vision Lab | *Research Assistant* June 2022 - Aug 2022
Advisor: **Dr. George Alvarez**, Fred Kavli Professor of Neuroscience, Department of Psychology

- Investigated the weight space of voxel-wise encoding representational similarity analysis (veRSA) and identified model features that significantly predict neural activity
- Conceptualized a study using ‘dropout’ as a method to systematically manipulate sparse versus distributed coding in deep neural networks
- Evaluated the geometric representations and accuracies of computer vision models with varying degrees of dropout and compared these model representations to neural representations

Boston College | Social & Cognitive Comp Neuro Lab | Research Assistant May 2021 - May 2023
Advisor: **Dr. Stefano Anzellotti**, Associate Professor, Department of Psychology and Neuroscience

- Employed univariate fMRI analyses to identify auditory regions of interest (ROIs) in the brain, complemented by an anatomical probability atlas to define visual ROIs
- Conducted multivariate statistical dependence analyses based on neural networks (MVPN) to identify brain regions involved in audio-visual integration
- Analyzed multi-stream dependence metrics in the fusiform face area, occipital face area, and face-selective superior temporal sulcus

Boston College | Canine Cognition Center | Research Assistant Sep 2020 - May 2023
Advisor: **Dr. Angela Johnston**, Assistant Professor, Department of Psychology and Neuroscience

- Designed a flexible paradigm to evaluate dogs' ability to follow human goal-directed actions
- Ran several behavioral studies with dogs, ensuring a positive experience for dogs and their parents
- Developed an efficient pipeline for the random assignment of experimental conditions, optimizing study design and execution

Publications

Fajardo, G., Fang, M., Anzellotti, S. (Under Review). Distinct Brain Regions Combine Auditory Representations with Different Visual Streams. [\[Preprint\]](#)

Prince, J.S., **Fajardo, G.**, Alvarez, G.A., Konkle, T. (2024). Manipulating dropout reveals an optimal balance of efficiency and robustness in biological and machine visual systems. *International Conference on Learning Representations 2024*. [\[Paper\]](#)

Conference Presentations

Fajardo, G., Hong, Y., Freeman, J. (February 2025). *Facial Stereotyping Relies on a Dynamic and High-Dimensional Trait Space*. Data Blitz presented at the Society for Personality and Social Psychology annual convention - Computational Psychology Preconference, Denver, CO.

Fajardo, G., Chwe, J.A., Davachi, L., Freeman, J. (April, 2024). *The neural basis of social categorization and individuation*. Poster presented at the Social and Affective Neuroscience society annual conference, Toronto, Canada.

Fajardo, G., Hong, Y., Freeman, J. (February, 2024). *The shared cognitive and neural mechanisms of trait concepts and facial stereotyping*. Poster presented at the Society for Personality and Social Psychology annual convention, San Diego, CA.

Prince, J.S., **Fajardo, G.**, Alvarez, G.A., Konkle, T. (August, 2023). *Dropout as a tool for understanding information distribution in human and machine visual systems*. Poster presented at the Cognitive Computational Neuroscience annual conference, Oxford, UK.

Fajardo, G., Alvarez, G.A., Konkle, T., Prince, J. (July, 2022). *Artificial vision model features most predictive of neural data*. Poster presented at the Leadership Alliance National Symposium, Hartford, CT.

Selected Courses

Neuroscience and Psychology: Cognitive and Neural Bases of Person Knowledge, fMRI, Research Practicum in AI, Current Topics in Moral Psychology, Computational Models of Cognition

Computer Science: Data Science, Biomedical Image Analysis, Computer Vision, NLP

Mathematics: Multivariable Calculus, Linear Algebra, Probability, Statistics, Math and ML

Teaching Experience

Teaching Assistant in the course *Biomedical Image Analysis* (CSCI 3397)

Jan 2023 - May 2023

Honors and Awards

National Science Foundation (NSF) Graduate Fellowship (GRFP), Honorable Mention 2025

Cientifico Latino Graduate Student Mentorship Initiative Scholar 2024

Boston College Honors Program in Psychology and Neuroscience 2021-2023

Dean's List 2nd Honors 2020-2023

Course Projects

How Latent and Perceptual Features Jointly Shape Social Group Inference

Employed a Bayesian computational model of cognition to investigate how perceptual features and latent trait attributions interact to inform inferences about an agent's social group membership.

Reliable Comparison Between DNN Models and the Brain

Designed a way to match the subject-to-subject variability of fMRI data for deep neural network vision models by training models with identical architectures but different initial weights.

Convolutional Neural Network Perception of Global and Local Facial Features

Trained a convolutional neural network to classify faces, then tested it on "scrambled faces" with disrupted global features but intact local features. We found that classification performance dropped to chance, suggesting that the model primarily relied on global facial features.

Political Twitter Sentiment Analysis

Applied deep and statistical machine learning sentiment classifiers to analyze tweets about political candidates, aiming to predict Senatorial election outcomes.

Anatomical and Behavioral Correlates of Dementia

Used logistic regression, KNN, Gaussian Naive Bayes, and decision tree classifiers to identify dementia in subjects based on MRI and behavioral data.

Relevant Skills

Programming: Python, Java, R, HTML, CSS, JavaScript, jsPsych, WebPPL, GitHub, Bash, Slurm

Data Science/ML: PyTorch, TensorFlow, Keras, SKlearn, Scipy, statsmodels, Pandas, NumPy, Matplotlib, Seaborn, NetworkX, NLTK, SpaCy, Gensim, OpenCV, BeautifulSoup

Cognitive Neuroscience: Nilearn, NLTools, fMRIPrep, MRICroGL, Nibabel, PsychoPy, FSL, SPM, SnPM, PyMVPD, AFNI

Languages: English (Fluent), Spanish (Fluent), French (Intermediate)