

# Marius Cătălin Iordan

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## ACADEMIC APPOINTMENTS & EDUCATION

Postdoctoral Researcher 2016 - present

**Princeton Neuroscience Institute, Princeton University**

Advisors: Jonathan D. Cohen, Kenneth A. Norman, Nicholas B. Turk-Browne, and Daniel N. Osherson

Ph.D., Computer Science, M.S., Computer Science 2009 - 2016

**Stanford University**

Advisors: Fei-Fei Li and Diane M. Beck (University of Illinois)

Degree Focus: Cognitive and Computational Neuroscience, Machine Learning

B.A., Computer Science, Mathematics, Cognitive Science 2005 - 2009

**Williams College**

*Magna cum laude*, Highest Honors in Computer Science

## FELLOWSHIPS, HONORS, & AWARDS

Society for Neuroscience (SfN) Postdoctoral Trainee Professional Development Award	2018
Real-Time Functional Imaging and Neurofeedback Conference (rtFIN) Best Poster Award	2017
Real-Time Functional Imaging and Neurofeedback Conference (rtFIN) Travel Award	2017
Society for Neuroscience (SfN) Graduate Student Trainee Professional Development Award	2015
Phi Beta Kappa William and Adeline Hendess Graduate Fellowship	2015
Stanford University Bio-X Vision Sciences Society (VSS) Travel Award	2015
Cognitive Neuroscience Society (CNS) Travel Award	2015
Stanford University Bio-X Society for Neuroscience (SfN) Travel Award	2014
Stanford University SPICE Community Enhancement Grant	2014
Stanford University VPGE Community Engagement Grant	2014
William R. Hewlett Graduate Fellowship (SGF)	2009 - 2014
Science Teaching Through Art (STAr) Best Presenter Award	2013
Science Teaching Through Art (STAr) Best Poster Award	2013
Sigma Xi Scientific Society, <i>elected</i>	2009
Williams College Horace F. Clark Fellowship Prize	2009
Computing Research Association (CRA) Undergraduate Awards, <i>Honorable Mention</i>	2009
Phi Beta Kappa Academic Honor Society, <i>elected</i>	2008
Williams College Edgar M. Bronfman Class of 1960 Fellowship	2006 - 2007

## PUBLICATIONS AND SUBMITTED MANUSCRIPTS

**Iordan MC**, Giallanza T, Ellis CT, Beckage N, Cohen, JD. (submitted). Context Matters: Recovering Human Semantic Structure from Machine Learning Analysis of Large-Scale Text Corpora. Preprint at <https://arxiv.org/abs/1910.06954>.

**Iordan MC**, Greene MR, Fei-Fei L, Beck DM. (submitted). Sequential warping of cortical representational geometries according to cognitive principles contributes to the emergence of separable categories.

**Iordan MC**, Ellis CT, Lesnick M, Osherson DN, Cohen JD. (2018). Feature ratings and empirical dimension-specific similarity explain distinct aspects of semantic similarity. *Proceedings of the 40<sup>th</sup> Annual Meeting of the Cognitive Science Society*.

Piazza EA, **Iordan MC**, Lew-Williams C. (2017). Mothers consistently alter their unique vocal fingerprints to communicate with infants. *Current Biology*.

**Iordan MC**, Greene MR, Beck DM, Fei-Fei L. (2016). Typicality sharpens neural representations in object-selective cortex. *Neuroimage*.

**Iordan MC**, Joulin A, Beck DM, Fei-Fei L. (2015). Locally-optimized inter-subject alignment of functional cortical regions. *Proceedings of the 4th Annual Machine Learning and Interpretation in Neuroimaging (MLINI) Workshop, Advances in Neural Processing Systems (NIPS)*.

**Iordan MC**, Greene MR, Beck DM, Fei-Fei L. (2015). Basic level category structure emerges gradually across human ventral visual cortex. *Journal of Cognitive Neuroscience*.

Baldassano C, **Iordan MC**, Beck DM, Fei-Fei L. (2012). Discovering voxel-level functional connectivity between cortical regions. *Proceedings of the 1st Annual Machine Learning and Interpretation in Neuroimaging (MLINI) Workshop, Advances in Neural Processing Systems (NIPS)*.

Baldassano C, **Iordan MC**, Beck DM, Fei-Fei L. (2012). Voxel-level functional connectivity using spatial regularization. *NeuroImage*.

Grigoriev I, **Iordan MC**, Lubin A, Ince N, Silva CE. (2012). On  $\mu$ -compatible metrics and measurable sensitivity. *Colloquium Mathematicum*.

Heeringa B, **Iordan MC**, Theran L. (2011). Searching in dynamic partial orders. *Algorithms and Data Structures Symposium (WADS)*.

Barker S, **Iordan MC**, Albrecht J, Raghavan B. (2008). Kudzu: A self-balancing P2P file transfer system. *Proceedings of the 3rd Workshop on Tackling Computer Systems Problems with Machine Learning (SysML)*.

## MANUSCRIPTS IN PREPARATION

**Iordan MC**, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (in preparation). Using closed-loop real-time fMRI neurofeedback to induce neural plasticity and influence perceptual similarity.

**Iordan MC**, Ellis CT, Lesnick M, Osherson DN, Cohen JD. (in preparation). Predicting semantic similarity judgments from neural responses jointly elicited across frontal, parietal, and occipito-temporal cortices.

**lordan MC**, Ellis CT, Lesnick M, Osherson DN, Cohen JD. (in preparation). Semantic similarity judgments exhibit anchoring effects when cued across specific features.

**lordan MC**, Fannjiang C, Fei-Fei L, Beck DM. (in preparation). Pushing the boundaries of fine-grained object classification using fMRI decoding in human occipito-temporal cortex.

Hoskin AN, Musslick S, **lordan MC**, Cohen JD. (in preparation). Why we struggle to multitask: Converging evidence from computational modeling, human behavior, and neuroimaging.

## CONFERENCE PRESENTATIONS

### 2019

**lordan MC**, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2019). Creating visual categories with closed-loop real-time fMRI neurofeedback. *Real-Time Functional Imaging and Neurofeedback Conference (rtFIN)*.

**lordan MC**, Ellis CT, Osherson DN, Cohen JD. (2019). Uncovering the neural underpinnings of Semantic similarity judgments. *Society for Neuroscience Annual Meeting (SfN)* **(Oral)**.

Giallanza T, **lordan MC**, Ellis CT, Cohen JD. (2019). Context-aware word embedding models significantly improve prediction of human conceptual relationships. *Society for Neuroscience Annual Meeting (SfN)* **(Oral)**.

**lordan MC**, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2019). Using closed-loop real-time fMRI neurofeedback to induce neural plasticity and influence perceptual similarity. *Vision Sciences Society Annual Meeting (VSS)*.

Riberto M, **lordan MC**, Paz R, Pobric G, Talmi D. (2019). Using representational similarity analysis to investigate emotional effects on mental representation. *Israel Society for Neuroscience Annual Meeting (ISFN)*.

### 2018

**lordan MC**, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2018). Using closed-loop real-time fMRI neurofeedback to induce neural plasticity and influence perceptual similarity. *Society for Neuroscience Annual Meeting (SfN)* **(Professional Development Award)**.

Hoskin AN, Musslick S, **lordan MC**, Cohen JD. (2018). Why we struggle to multitask: Converging evidence from computational modeling, human behavior, and neuroimaging. *Society for Neuroscience Annual Meeting (SfN)*.

**lordan MC**, Ellis CT, Lesnick M, Osherson DN, Cohen JD. (2018). Feature ratings and empirical dimension-specific similarity explain distinct aspects of semantic similarity. *Cognitive Science Society Annual Meeting (CogSci)* **(Oral)**.

**lordan MC**, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2018). Inducing neural plasticity and perceptual similarity using real-time fMRI neurofeedback. *Organization for Human Brain Mapping Annual Meeting (OHBM)*.

**lordan MC**, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2018). Inducing neural plasticity and perceptual similarity using real-time fMRI neurofeedback. *Vision Sciences Society Annual Meeting (VSS)* **(Oral)**.

### 2017

**Iordan MC**, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2017). KL-evidence: A novel multivariate method for differentiating representations. *Real-Time Functional Imaging and Neurofeedback Conference (rtFIN)* **(Travel Award) (Best Poster Award)**.

**Iordan MC**, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2017). Inducing neural plasticity and perceptual similarity using real-time fMRI neurofeedback. *Society for Neuroscience Annual Meeting (SfN)*.

Piazza EA, **Iordan MC**, Lew-Williams C, Hasson U. (2017). The importance of "motherese": Early drivers of successful communication. *Society for Neuroscience Annual Meeting (SfN)*.

Piazza EA, **Iordan MC**, Lew-Williams C. (2017). Mothers consistently alter their unique vocal fingerprints to communicate with their infants. *Interdisciplinary Advances in Statistical Learning (IASL)* **(Oral)**.

**Iordan MC**, Ellis CT, Osherson DN, Cohen JD. (2017). The relative contribution of features and dimensions to semantic similarity. *Vision Sciences Society Annual Meeting (VSS)*.

Piazza EA, **Iordan MC**, Lew-Williams C. (2017). Timbre code-switching: How mothers alter their unique vocal statistics to communicate with their children. *Biennial Meeting of the Society for Research in Child Development (SRCD)* **(Oral)**.

## 2016

**Iordan MC**, Greene MR, Beck DM, Fei-Fei L. (2016). Sequential warping of neural representations according to cognitive principles across the ventral stream. *Society for Neuroscience Annual Meeting (SfN)*.

**Iordan MC**, Greene MR, Beck DM, Fei-Fei L. (2016). Category boundaries and typicality warp the neural representation space of real-world categories. *Cognitive Neuroscience Society Annual Meeting (CNS)*.

**Iordan MC**, Greene MR, Beck DM, Fei-Fei L. (2016). Typicality sharpens category boundaries in object-selective cortex. *Stanford University Bio-X Interdisciplinary Initiatives (IIP) Symposium*.

## 2015

**Iordan MC**, Joulin A, Beck DM, Fei-Fei L. (2015). Locally-optimized inter-subject alignment of functional cortical regions. *Machine Learning and Interpretation in Neuroimaging (MLINI) Workshop, NIPS*.

**Iordan MC**, Greene MR, Beck DM, Fei-Fei L. (2015). Typicality sharpens neural representation in object-selective cortex. *Society for Neuroscience Annual Meeting (SfN)* **(Oral) (Professional Development Award)**.

**Iordan MC**, Fannjiang C, Beck DM, Fei-Fei L. (2015). Pushing the boundaries of fine-grained object fMRI decoding in human visual cortex. *Organization for Human Brain Mapping Annual Meeting (OHBM)*.

**Iordan MC**, Greene MR, Beck DM, Fei-Fei L. (2015). Category boundaries and typicality warp the neural representation space of real-world categories. *Vision Sciences Society Annual Meeting (VSS)* **(Oral) (Travel Award)**.

Fannjiang C, **Iordan MC**, Beck DM, Fei-Fei L. (2015). Pushing the boundaries of fine-grained object classification using fMRI decoding in human visual cortex. *Vision Sciences Society Annual Meeting (VSS)*.

**Iordan MC**, Greene MR, Beck DM, Fei-Fei L. (2015). Typicality sharpens neural representation in object-selective cortex. *Cognitive Neuroscience Society Annual Meeting (CNS)* **(Oral) (Travel Award)**.

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2015). Basic level category structure emerges gradually across human ventral visual cortex. *Bay Area Vision Research Day (BAVRD)*.

## 2014

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2014). Cohesion and distinctiveness in human visual cortex favor basic level representations. *Society for Neuroscience Annual Meeting (SfN) (Oral) (Travel Award)*.

**Jordan MC**, Joulin A, Beck DM, Fei-Fei L. (2014). Locally-optimized inter-subject alignment of functional cortical regions. *Vision Sciences Society Annual Meeting (VSS) (Oral)*.

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2014). Cohesion and distinctiveness in human visual cortex favor basic level representations. *Stanford Center for Biomedical Imaging Symposium Annual Meeting (CBIS) (Oral)*.

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2014). Real-world objects acquire basic-level advantage in occipito-temporal cortex. *Biomedical Computation at Stanford University (BCATS) (Best Poster Award Runner-Up)*.

## 2013

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2013). Real-world objects acquire basic-level advantage in occipito-temporal cortex. *Bay Area Vision Research Day (BAVRD)*.

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2013). Object typicality sharpens neural representation in object-selective cortex. *Vision Sciences Society Annual Meeting (VSS) (Oral)*.

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2013). Real-world objects acquire basic-level advantage in occipito-temporal cortex. *Cognitive Neuroscience Society Annual Meeting (CNS)*.

## 2012

Baldassano C, **Jordan MC**, Beck DM, Fei-Fei L. (2012). Discovering voxel-level functional connectivity between cortical regions. *Machine Learning and Interpretation in Neuroimaging (MLINI) Workshop, Advances in Neural Information Processing Systems (NIPS) (Oral)*.

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2012). Neural representations of object categories at multiple taxonomic levels. *Vision Sciences Society Annual Meeting (VSS) (Oral)*.

## 2011

Baldassano C, **Jordan MC**, Beck DM, Fei-Fei L. (2011). Fine-grained functional connectivity using spatial regularization. *Machine Learning and Interpretation in Neuroimaging (MLINI) Workshop, Advances in Neural Information Processing Systems (NIPS)*.

Baldassano C, **Jordan MC**, Beck DM, Fei-Fei L. (2011). Objects in context: Decoding and connectivity. *Collaborative Research in Computational Neuroscience Principal Investigator Annual Meeting (CRCNS)*.

**Jordan MC**, Baldassano C, Beck DM, Fei-Fei L. (2011). Translation invariance of natural scene categories. *Vision Sciences Society Annual Meeting (VSS) (Oral)*.

Baldassano C, **Jordan MC**, Beck DM, Fei-Fei L. (2011). Decoding objects undergoing Contextual violations. *Vision Sciences Society Annual Meeting (VSS)*.

## INVITED TALKS

- Computational Approaches to Manipulating Semantic Knowledge in the Human Brain. May 2019  
*University of Rochester — Brain and Cognitive Sciences Department Seminar.*
- Computational Approaches to Manipulating Semantic Knowledge in the Human Brain. Apr 2019  
*McMaster University — Psychology, Neuroscience, and Behavior Colloquium.*
- Computational Approaches to Understanding the Organization of Semantic Knowledge. Mar 2019  
*University of Indiana, Bloomington — Machine Learning & Psychology Colloquium.*
- Using Closed-Loop Real-Time fMRI Neurofeedback to Influence Categorical Perception. Jan 2019  
*University of Toronto — Statistics & Psychology Colloquium.*
- Computational Approaches to Understanding Human Visual and Semantic Categorization. Dec 2018  
*Pomona College — Computer Science Department Colloquium Series.*
- Using Real-Time fMRI Neurofeedback to Induce Neural Plasticity and Perceptual Similarity. Sep 2017  
*Princeton University — Cognitive Research Seminar Series.*
- Object Categories: From Cognitive Structure to Neural Representation. Nov 2016  
*Williams College — Cognitive Science Colloquium Series.*
- Cognitive Utility Effects on Neural Dimensions of Object Categorization. Feb 2016  
*University of California, Berkeley — Psychology Department Seminar.*
- Uncovering the Neural Representation of Multiple Dimensions of Object Categorization. Sep 2015  
*Princeton University — Princeton Neuroscience Institute Seminar.*
- Basic Level Category Structure Emerges Gradually Across Human Ventral Visual Cortex. Jan 2015  
*Stanford University — Psychology Department Vision Lunch Seminar.*
- Cohesion and Distinctiveness in Visual Cortex Favor Basic Level Representations. Oct 2014  
*Cañada College — STEM Speaker Series.*
- Typicality Sharpens Neural Representations in Object-Selective Cortex. Aug 2013  
*University of Rochester — Brain and Cognitive Sciences Department Seminar.*
- Real-World Objects Acquire Basic Level Advantage in Occipito-Temporal Cortex. Dec 2012  
*University of California, Berkeley — Vision Science Department Annual Retreat.*

## TEACHING EXPERIENCE

### Instructor

- Cognitive and Computational Concerns in Cortical Concept Categorization Fall 2017  
*Princeton University. Neuroscience Junior Tutorial. 11 students*

### Guest Lectures

Networks and Hierarchical Processing: Object Recognition in Human and Computer Vision  
*Stanford University. CS 131. Computer Vision and Applications* Dec 2014

A Primer on Human Vision: Insights and Inspiration for Computer Vision  
*Stanford University. CS 131. Computer Vision and Applications* Oct 2014

### Course Assistant | Stanford University

CS 131. Computer Vision, 50 students Fall 2014  
CS 229. Machine Learning, 460 students Fall 2011

### Teaching Assistant | Williams College

CS 334. Programming Languages, 30 students Spring 2009  
CS 361. Theory of Computation, 25 students Fall 2008  
CS 334. Programming Languages, 30 students Spring 2008  
MATH 211. Linear Algebra, 60 students Spring 2008  
CS 361. Theory of Computation, 20 students Fall 2007  
MATH 211. Linear Algebra, 60 students Spring 2007  
CS 237. Microarchitecture, 35 students Fall 2006  
MATH 211. Linear Algebra, 120 students Fall 2006

## OUTREACH, COMMUNICATION, AND MENTORING

### Undergraduate Research Mentor

Tyler Giallanza, Southern Methodist University & Princeton University 2019 - present  
Project: "Predicting Human Semantic Judgments Using Contextually-Specific  
Data-Driven Word Embeddings Models"

Talk at the *Society for Neuroscience Annual Meeting* (SfN 2019)

Clara Fannjiang, Stanford University 2014 - 2015  
Project: "Fine-Grained fMRI Decoding of Object Categories in Visual Cortex"  
Poster at the *Vision Sciences Society Annual Meeting* (VSS 2015)

### Alan Alda Center for Communicating Science Workshop | Princeton University

Professional Development Coordinator 2018  
Organized workshop, secured program funding: Langfeld Fund Grant (\$42,610)

### SPLASH - Teaching and Outreach Program | Stanford University & Princeton University

"The Art of Effective Communication: A Primer on Telling a Good Story" 2013 - 2017

## SAILORS: Stanford University AI Lab Outreach Summer Program

Personal Growth Session Organizer: Scientific Communication 2015

## Dinner with a Scientist – Community Outreach Program

“Visual Illusions: What You See and What’s Really There” 2014 – 2015

## STAR: Science Teaching through Art

Program Coordinator 2014

Secured program funding: VPGE CEG Grant (\$2,500), VPGE SPICE Grant (\$700)

Developed and organized workshops, outreach events, and poster sessions

Presenter, *Best Poster Award, Best Presenter Award* 2013

## SERVICE

Princeton Neuroscience Institute Professional Development Committee 2017 – present

Stanford University Vision Lab IRB Protocol Director 2015 – 2016

Stanford University Computer Science Graduate Admissions, *Ph.D. Student Buddy* 2012 – 2014

Williams College Student Mathematics and Statistics Advisory Board (SMASAB) 2007 – 2008

Williams College Computer Science Student Advisory Committee (CoSSAC) 2006 – 2008

Conference Program Committee:

*Pattern Recognition in Neuroimaging (PRNI) 2016*

Volunteer Reviewer – Neuroscience & Psychology:

*Cerebral Cortex*

*Journal of Neuroscience*

*Neuroimage*

*PLOS Computational Biology*

*Pattern Recognition in Neuroimaging (PRNI)*

*Psychonomic Bulletin and Review*

Volunteer Reviewer – Computer Vision & Machine Learning:

*Advances in Neural Information Processing Systems (NIPS)*

*European Conference on Computer Vision (ECCV)*

*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*