

# Marius Cătălin Iordan

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## ACADEMIC APPOINTMENTS

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Postdoctoral Research Associate 2016 - present

**Princeton Neuroscience Institute, Princeton University**

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

## EDUCATION

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Ph.D., 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, AND AWARDS

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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) 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

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

**Jordan MC** (2016). Uncovering the Neural Representation of Multiple Dimensions of Object Categorization in Human Visual Cortex. *Ph.D. Thesis in Computer Science, Stanford University*.

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2016). Typicality Sharpens Neural Representations in Object-Selective Cortex. *Neuroimage*.

**Jordan 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, NIPS*.

**Jordan MC**, Greene MR, Beck DM, Fei-Fei L. (2015). Basic Level Category Structure Emerges Gradually Across Human Ventral Visual Cortex. *Journal of Cognitive Neuroscience (JOCN)*.

Baldassano C, **Jordan 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, NIPS*.

Baldassano C, **Jordan MC**, Beck DM, Fei-Fei L. (2012). Voxel-Level Functional Connectivity Using Spatial Regularization. *NeuroImage*.

Grigoriev I, **Jordan MC**, Lubin A, Ince N, Silva CE. (2012). On  $\mu$ -compatible Metrics and Measurable Sensitivity. *Colloquium Mathematicum*.

Heeringa B, **Jordan MC**, Theran L. (2011). Searching in Dynamic Partial Orders. *Algorithms and Data Structures Symposium (WADS)*.

**Jordan MC**. (2009). Leaf-Line Tree: A Data Structure for Searching in Dynamic Tree-Like Partial Orders. *Honors Thesis in Computer Science, Williams College*.

Barker S, **Jordan MC**, Albrecht J, Raghavan B. (2008). Kudzu: A Self-Balancing P2P File Transfer System. *Workshop on Tackling Computer Systems Problems with Machine Learning (SysML)*.

## MANUSCRIPTS UNDER REVIEW OR IN PREPARATION

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**Jordan MC**, Greene MR, Fei-Fei L, Beck DM. (in preparation). Sequential Warping of Cortical Representational Geometries According to Cognitive Principles Contributes to the Emergence of Separable Categories.

**Jordan 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.

**Jordan MC**, Ellis CT, Lesnick M, Osherson DN, Cohen JD. (in preparation). Feature Ratings and Dimension-Cued Similarity Explain Distinct Aspects of Semantic Similarity.

## CONFERENCE PRESENTATIONS

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**Jordan 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)**.

**Jordan 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)*.

**Jordan 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)**.

**Jordan 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)**.

**Jordan 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, **Jordan MC**, Lew-Williams C, Hasson U. (2017). The Importance of “Motherese”: Early Drivers of Successful Communication. *Society for Neuroscience Annual Meeting (SfN)*.

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

**Jordan 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, **Jordan 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)**.

**Jordan 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)*.

**Jordan 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)*.

**Jordan 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*.

**Jordan 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*.

**Jordan 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)**.

**Jordan 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)**.

**Iordan 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)*.

**Iordan 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)**.

**Iordan 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)**.

**Iordan 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)**.

**Iordan 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)**.

**Iordan 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)*.

**Iordan 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)**.

**Iordan 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)*.

Baldassano C, **Iordan MC**, Beck DM, Fei-Fei L. (2012). Discovering Voxel-Level Functional Connectivity Between Cortical Regions. *Machine Learning and Interpretation in Neuroimaging (MLINI) Workshop, NIPS* **(Oral)**.

**Iordan 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)**.

Baldassano C, **Iordan MC**, Beck DM, Fei-Fei L. (2011). Fine-Grained Functional Connectivity using Spatial Regularization. *Machine Learning and Interpretation in Neuroimaging (MLINI) Workshop, NIPS*.

**Iordan MC**, Baldassano C, Beck DM, Fei-Fei L. (2011). Translation Invariance of Natural Scene Categories. *Vision Sciences Society Annual Meeting (VSS)* **(Oral)**.

Baldassano C, **Iordan MC**, Beck DM, Fei-Fei L. (2011). Decoding Objects Undergoing Contextual Violations. *Vision Sciences Society Annual Meeting (VSS)*.

## INVITED TALKS

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Using Real-Time fMRI Neurofeedback to Induce Neural Plasticity and Perceptual Similarity. <i>Princeton University — Cognitive Research Seminar Series.</i>	Sep 2017
Object Categories: From Cognitive Structure to Neural Representation. <i>Williams College — Cognitive Science Colloquium Series.</i>	Nov 2016
Cognitive Utility Effects on Neural Dimensions of Object Categorization. <i>University of California, Berkeley — Psychology Department Seminar.</i>	Feb 2016
Uncovering the Neural Representation of Multiple Dimensions of Object Categorization. <i>Princeton University — Princeton Neuroscience Institute Seminar.</i>	Sep 2015
Basic Level Category Structure Emerges Gradually Across Human Ventral Visual Cortex. <i>Stanford University — Psychology Department Vision Lunch Seminar.</i>	Jan 2015
Cohesion and Distinctiveness in Visual Cortex Favor Basic Level Representations. <i>Cañada College — STEM Speaker Series.</i>	Oct 2014
Typicality Sharpens Neural Representations in Object-Selective Cortex. <i>University of Rochester — Brain and Cognitive Sciences Department Seminar.</i>	Aug 2013
Real-World Objects Acquire Basic Level Advantage in Occipito-Temporal Cortex. <i>University of California, Berkeley — Vision Science Department Annual Retreat.</i>	Dec 2012

## TEACHING EXPERIENCE

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### Instructor

*Discussion-based group tutorial that taught students how to analyze and interpret modern neuroscience literature. Topics focused on semantic and visual categorization in humans and non-human primates, covering multiple modalities (fMRI, ECoG, MEG, DNNs, modeling).*

Cognitive and Computational Concerns in Cortical Concept Categorization <i>Princeton University. Neuroscience Junior Tutorial. 11 students</i>	Fall 2017
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### Guest Lectures

Networks and Hierarchical Processing: Object Recognition in Human and Computer Vision <i>Stanford University. CS 131. Computer Vision and Applications</i>	Dec 2014
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A Primer on Human Vision: Insights and Inspiration for Computer Vision <i>Stanford University. CS 131. Computer Vision and Applications</i>	Oct 2014
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### Course Assistant | Stanford University

*Taught discussion sections, held office hours, graded assignments, assisted students with problem sets and code. Assignments included Matlab programming and extensive theoretical proofs.*

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

### Teaching Assistant | Williams College

*Assisted students with coding assignments held informal meetings and consulting hours, graded student work. Assignments included extensive theoretical proofs and programming in Java, C, C++, Lisp, ML, Smalltalk, and Assembly language.*

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

## MENTORING AND OUTREACH

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

*Volunteer instructors design and teach their own class to middle school and high school students.*

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

### Undergraduate Research Mentor

*Taught one-on-one "Introduction to Computational Neuroimaging" weekly tutorial sessions, supervised undergraduate research.*

Clara Fannjiang, Stanford University 2014 - 2015

Project: "Fine-Grained fMRI Decoding of Object Categories in Visual Cortex"

### SAILORS: Stanford AI Lab Outreach Summer Program

*Summer camp program for high school students designed to spark interest in the STEM fields for underrepresented minorities and foster personal growth through career development workshops, mentoring, and social events.*

Personal Growth Session Organizer: Scientific Communication 2015

### Dinner with a Scientist - Community Outreach Program

*Scientists from Bay Area schools develop a hands-on activity based on their research to share with groups of 4<sup>th</sup> and 5<sup>th</sup> grade students.*

"Visual Illusions: What You See and What's Really There" 2014 - 2015

### STAR: Science Teaching through Art

*Science graduate students and postdocs are trained to showcase their research in a visually engaging and artistic manner. Interactive teaching poster sessions focus on encouraging local high school and community college students to pursue careers in science research.*

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

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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*

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)*

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