MARIUS CĂTĂLIN IORDAN

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ACADEMIC APPOINTMENTS & EDUCATION

Present **Postdoctoral Researcher**, Princeton Neuroscience Institute & Psychology Department | **Princeton University**
Advisors: Jonathan D. Cohen, Kenneth A. Norman, Nicholas B. Turk-Browne, & Daniel N. Osherson
Focus: Cognitive and computational neuroscience, neural networks, real-time fMRI, neurofeedback

2016 **Ph.D., Computer Science** | M.S., Computer Science | **Stanford University**
Advisors: Fei-Fei Li & Diane M. Beck
Focus: Cognitive and computational neuroscience, machine learning, fMRI, psychophysics

2009 **B.A, Computer Science, Mathematics, Cognitive Science** | **Williams College**
Magna cum laude, Highest Honors in Computer Science

GRANTS & FELLOWSHIPS

DUAL CITIZENSHIP: UNITED STATES AND ROMANIA (EUROPEAN UNION)

2020 GRAMMY Museum Foundation **Research Grant**, *Investigating the Neural Hierarchy of Audio-Motor Integration During Naturalistic Music Performance*, Co-PI, $19,758 (33% share).

2018 Princeton University Psychology Department Langfeld Fund **Professional Development Grant**, Funding for organizing Alan Alda Center for Communicating Science workshop at PNI, $42,610.

2015 Phi Beta Kappa William and Adeline Hendess **Graduate Fellowship**, Doctoral dissertation award, $5,000.

2014 Stanford University VPGE **Community Engagement Grant**, Funding for organizing Science Teaching Through Art (STAr) professional development and outreach program, $2,500.

2014 Stanford University SPICE **Community Enhancement Grant**, Funding for organizing Science Teaching Through Art (STAr) professional development and outreach program, $700.

2009 William R. Hewlett Stanford University **Graduate Fellowship**, Full support for 3 years of doctoral dissertation research, $224,900.

2009 Williams College Horace F. Clark **Graduate Fellowship** Prize, Support for graduate studies, $4,000.

2006 Williams College Edgar M. Bronfman Class of 1960 **Undergraduate Fellowship**, Full support for 1 year of undergraduate studies, $45,140.

PUBLICATIONS

Iordan MC, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2020) Sculpting new visual concepts into the human brain. *Preprint at* https://www.biorxiv.org/content/10.1101/2020.10.14.339853v1.

Iordan MC, Giallanza T, Ellis CT, Beckage NM, Cohen JD. (2019). 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, 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 40th 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 μ-compatible metrics and measurable sensitivity. *Colloquium Mathematicum*.

Heeringa BA, **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

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

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

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

Riberto M, **Iordan MC**, Paz R, Pobric G, Talmi D. Effects of emotional valence of natural stimuli on semantic similarity. (in preparation)

AWARDS AND HONORS

2018 Society for Neuroscience (SfN) Postdoctoral Trainee Professional Development Award (TPDA)
2017 Real-Time Functional Imaging and Neurofeedback Conference (rtfIN) Best Poster Award
2017 Real-Time Functional Imaging and Neurofeedback Conference (rtfIN) Travel Award
2015 Society for Neuroscience (SfN) Graduate Student Trainee Professional Development Award (TPDA)
2015 Stanford University Bio-X Vision Sciences Society (VSS) Travel Award
2015 Cognitive Neuroscience Society (CNS) Travel Award
2014 Stanford University Bio-X Society for Neuroscience (SfN) Travel Award
2013 Science Teaching Through Art (STAr) Best Presenter Award
2013 Science Teaching Through Art (STAr) Best Poster Award
2009 Sigma Xi Scientific Society, *elected*
2009 Computing Research Association (CRA) Outstanding Undergraduate Awards, *Honorable Mention*
2008 Phi Beta Kappa Academic Honor Society, *elected*

INVITED TALKS

2020/02 Princeton University, Bio-Engineering Colloquium Series
2020/01 Williams College, Computer Science Department Seminar
2019/05 University of Rochester, Brain and Cognitive Sciences Department Seminar
2019/04 McMaster University, Psychology, Neuroscience, and Behavior Colloquium
2019/03 Indiana University, Machine Learning and Psychology Colloquium
2019/01 University of Toronto, Statistics & Psychology Colloquium
2018/12 Pomona College, Computer Science Department Colloquium Series
2017/09 Princeton University, Cognitive Research Seminar Series
2016/11 Williams College, Cognitive Science Colloquium Series
2016/02 University of California, Berkeley, Psychology Department Seminar
2015/09 Princeton University, Princeton Neuroscience Institute Seminar
2015/01 Stanford University, Psychology Department Vision Lunch Seminar
2014/10 Cañada College, STEM Speaker Series
2013/08 University of Rochester, Brain and Cognitive Sciences Department Seminar
2012/12 University of California, Berkeley, Vision Science Department Annual Retreat

CONFERENCE TALKS

Iordan MC, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2020) Programming the human brain with new visual concepts. *The 3rd NeuroMatch Conference (NeuroMatch 3.0).*

Iordan MC, Giallanza T, Ellis CT, Beckage, NM, Cohen JD. (2020). Context matters: Recovering human semantic structure from machine learning analysis of large-scale text corpora. *Cognitive Science Society Annual Meeting, Neural Network Models of Cognition Affinity Group (CogSci).*

Iordan MC, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. (2020) Creating visual categories using closed-loop real-time fMRI neurofeedback. *Vision Sciences Society Annual Meeting (VSS).*

Iordan MC, Giallanza T, Ellis CT, Osherson DN, Cohen JD. (2019). Uncovering the neural underpinnings of semantic similarity judgments. *Society for Neuroscience Annual Meeting (SfN).*

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

Iordan 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).*

Iordan 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).*

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

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).* **(Travel Award)**

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

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).* **(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).*

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 Annual Symposium (CBIS).*

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

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).*

Iordan MC, Greene MR, Beck DM, Fei-Fei L. (2011). Translation invariance of natural scene categories. *Vision Sciences Society Annual Meeting (VSS).*

OTHER CONFERENCE PRESENTATIONS

Slaughter J, Peterson J, **Iordan MC***, Cohen JD*. (2020). Using convolutional neural networks to predict human behavior and neural representations. *Leadership Alliance National Symposium (LANS).*

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

Iordan 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, **Iordan 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).*

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

Iordan 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).*

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).*

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).*

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 Symposium (IIP).*

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, Advances in Neural Processing Systems (NIPS).*

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).*

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

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). 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 occipito-temporal cortex. *Bay Area Vision Research Day (BAVRD).*

Iordan MC, Greene MR, Beck DM, Fei-Fei L. (2013). Real-world objects acquire basic-level advantage 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, Advances in Neural Processing Systems (NIPS).*

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, Advances in Neural Processing Systems (NIPS).*

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

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

Heeringa BA, **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. *Workshop on Tackling Computer Systems Problems with Machine Learning (SysML)*.

TEACHING EXPERIENCE

Fall 2020 **Instructor,** Princeton University, Neuroscience Senior Thesis Workshop, 11 students
Developing a Strong Rationale for Performing Empirical Research and for Scientific Communication

Sum 2020 **Guest Lecturer,** Princeton University, Scientific Computing Using Matlab and Python, 25 students
Multivariate Pattern Separation Using Applied Machine Learning Algorithms

Fall 2017 **Instructor,** Princeton University, Neuroscience Junior Tutorial, 11 students
Cognitive and Computational Concerns in Cortical Concept Categorization
Overall teaching effectiveness (average rating): 4.6 / 5.0

Fall 2014 **Guest Lecturer,** Stanford University, CS 131. Computer Vision and Applications, 50 students
Networks and Hierarchical Processing: Object Recognition in Human and Computer Vision

Fall 2014 **Guest Lecturer,** Stanford University, CS 131. Computer Vision and Applications, 50 students
A Primer on Human Vision: Insights and Inspiration for Computer Vision

Fall 2014 **Course Assistant,** Stanford University, CS 131. Computer Vision, 50 students
Overall teaching effectiveness (average rating): 5.6 / 7.0

Fall 2011 **Course Assistant,** Stanford University, CS 229. Machine Learning, 460 students

Spr 2009 **Teaching Assistant,** Williams College, CS 334. Programming Languages, 30 students

Fall 2008 **Teaching Assistant,** Williams College, CS 361. Theory of Computation, 25 students

Spr 2008 **Teaching Assistant,** Williams College, CS 334. Programming Languages, 30 students

Spr 2008 **Teaching Assistant,** Williams College, MATH 211. Linear Algebra, 60 students

Fall 2007 **Teaching Assistant,** Williams College, CS 361. Theory of Computation, 20 students

Spr 2007 **Teaching Assistant,** Williams College, MATH 211. Linear Algebra, 60 students

Fall 2006 **Teaching Assistant,** Williams College, CS 237. Microarchitecture, 35 students

Fall 2006 **Teaching Assistant,** Williams College, MATH 211. Linear Algebra, 120 students

MENTORSHIP, OUTREACH, & SCIENCE COMMUNICATION

2020-21 **Undergraduate Research Mentor**, Joshua Slaughter, Princeton University
Project: *Using convolutional neural networks to predict human behavior and neural representations*
Poster at the *Leadership Alliance National Symposium (LANS)* 2020

2019-20 **Undergraduate Research Mentor**, Tyler Giallanza, Princeton University
Project: *Predicting human semantic judgments using deep neural network word embedding models*
Talk at the *Society for Neuroscience Annual Meeting (SfN)* 2019
Currently: Ph.D. student in Neuroscience, Princeton University (2020-present)

2018 **Science Communication Training & Professional Development Coordinator**, Princeton University
Alan Alda Center for Communicating Science Workshop
Organized workshop, secured program funding (Langfeld Fund Grant: $42,610)

2013-17 **Outreach Instructor, SPLASH Teaching and Outreach Program**, Stanford & Princeton University
Designed and taught class: *The Art of Effective Communication: A Primer on Telling a Good Story*
Twice per year, two sections of 19 high-school students each (~350 students total)

2015 **Professional Development Session Organizer**, Stanford AI Lab Outreach Summer Program
Designed and taught session on scientific communication for 40 high-school students

2014-15 **Outreach Instructor, Dinner with a Scientist Community Outreach Program**, Oakland, CA
Designed and taught science demo: *Visual Illusions: What You See and What's Really There*
Three groups of 8-12 elementary school students per year (~50 students total)

2014-15 **Undergraduate Research Mentor**, Clara Fannjiang, Stanford University
Project: *Fine-grained fMRI decoding of object categories in human visual cortex*
Poster at the *Vision Sciences Society Annual Meeting (VSS)* 2015
Currently: Ph.D. student in Computer Science, University of California, Berkeley (2018-present)

2013-14 **Science Communication Training Professional Development Coordinator**, Stanford University
Science Teaching Through Art (STAr) professional development for graduate students and postdocs (~25 per year) and science outreach to high school and community college students (~200 per year)
Developed and organized workshops, outreach events, poster sessions, secured program funding

PROFESSIONAL ACTIVITIES & SERVICE

2017-21 Princeton Neuroscience Institute Professional Development Committee

2020 Undergraduate Honors Thesis Committee, Neuroscience Program, Bates College: Alyssa Rohan

2016 Conference Program Committee: Pattern Recognition in Neuroimaging (PRNI)

2015-16 Stanford Vision Lab IRB Protocol Director

2012-14 Stanford University Computer Science Graduate Admissions, *Ph.D. Student Buddy*

2007-08 Williams College Student Mathematics and Statistics Advisory Board (SMASAB)

2006-08 Williams College Computer Science Student Advisory Committee (CoSSAC)

Volunteer Reviewer – Neuroscience and Psychology:

Cerebral Cortex

Journal of Cognitive Neuroscience

Journal of Neuroscience

Nature Human Behaviour

Neuroimage

PLOS Biology

PLOS Computational Biology

Pattern Recognition in Neuroimaging (PRNI)

Psychonomic Bulleting and Review

Volunteer Reviewer – Computer Vision and Machine Learning:

Advances in Neural Information Processing Systems (NIPS)

European Conference on Computer Vision (ECCV)

IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

REFERENCES

Dr. Jonathan D. Cohen, M.D., Ph.D.
Professor, Princeton Neuroscience Institute & Psychology Department
Princeton University
Email: jdc@princeton.edu

Dr. Diane M. Beck, Ph.D.
Professor, Beckman Institute & Psychology Department
University of Illinois
Email: dmbeck@illinois.edu

Dr. Kenneth A. Norman, Ph.D.
Professor, Psychology Department
Princeton University
Email: knorman@princeton.edu

Dr. Nicholas B. Turk-Browne, Ph.D.
Professor, Psychology Department
Yale University
Email: nicholas.b.turk-browne@yale.edu

Dr. Fei-Fei Li, Ph.D.
Professor, Computer Science Department
Stanford University
Email: feifeili@cs.stanford.edu