

# MARIUS CĂTĂLIN IORDAN

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## ACADEMIC APPOINTMENTS & EDUCATION

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- 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)

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- 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 research 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 first 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

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- Iordan MC**, Giallanza T, Ellis CT, Beckage NM, Cohen JD. (under revision). 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  $\mu$ -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 IN PREPARATION

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- Iordan MC**, Ritvo VJH, Norman KA, Turk-Browne NB, Cohen JD. Creating visual categories using closed-loop real-time fMRI neurofeedback.
- Iordan MC**, Giallanza T, Ellis CT, Cohen JD. Predicting semantic similarity judgments from neural responses jointly elicited across frontal, parietal, and occipito-temporal cortices.
- 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.
- Hoskin AN, Musslick S, **Iordan MC**, Cohen JD. Why we struggle to multitask: Converging evidence from computational modeling, human behavior, and neuroimaging.

## AWARDS AND HONORS

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| 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, <i>elected</i>   |
| 2009 | Computing Research Association (CRA) Outstanding Undergraduate Awards, <i>Honorable Mention</i> |
| 2008 | Phi Beta Kappa Academic Honor Society, <i>elected</i>   |

## INVITED TALKS

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- 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

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- 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)**

- lordan MC**, Joulin A, Beck DM, Fei-Fei L. (2014). Locally-optimized inter-subject alignment of functional cortical regions. *Vision Sciences Society Annual Meeting (VSS)*.
- lordan 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)*.
- lordan MC**, Greene MR, Beck DM, Fei-Fei L. (2013). Object typicality sharpens neural representations in object-selective cortex. *Vision Sciences Society Annual Meeting (VSS)*.
- lordan MC**, Greene MR, Beck DM, Fei-Fei L. (2012). Neural representations of object categories at multiple taxonomic levels. *Vision Sciences Society Annual Meeting (VSS)*.
- lordan MC**, Greene MR, Beck DM, Fei-Fei L. (2011). Translation invariance of natural scene categories. *Vision Sciences Society Annual Meeting (VSS)*.

## OTHER CONFERENCE PRESENTATIONS

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- Slaughter J, Peterson J, **lordan MC\***, Cohen JD\*. (2020). Using convolutional neural networks to predict human behavior and neural representations. *Leadership Alliance National Symposium (LANS)*.
- lordan 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)*.
- 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)*.
- 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. Why we struggle to multitask: Converging evidence from computational modeling, human behavior, and neuroimaging. *Society for Neuroscience Annual Meeting (SfN)*.
- 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. (2017). KL-Evidence: A novel multivariate method for differentiating representations. *Real-Time Functional Imaging and Neurofeedback Conference (rtfIN)*. **(Travel Award) (Best Poster Award)**
- lordan 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, **lordan MC**, Lew-Williams C, Hasson U. (2017). The importance of “motherese”: Early drivers of successful communication. *Society for Neuroscience Annual Meeting (SfN)*.
- Piazza EA, **lordan MC**, Lew-Williams C. (2017). Mothers consistently alter their unique vocal fingerprints to communicate with their infants. *Interdisciplinary Advances in Statistical Learning (IASL)*.
- lordan 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

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- 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

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- 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

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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 Neuroscience*  
*Nature Human Behaviour*  
*Neuroimage*  
*PLOS Biology*  
*PLOS Computational Biology*  
*Pattern Recognition in Neuroimaging (PRNI)*  
*Psychonomic Bulletin 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

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**Dr. Jonathan D. Cohen**, M.D., Ph.D.

Professor, Princeton Neuroscience Institute & Psychology Department  
Princeton University  
Email: [jdc@princeton.edu](mailto:jdc@princeton.edu)

**Dr. Diane M. Beck**, Ph.D.

Professor, Beckman Institute & Psychology Department  
University of Illinois  
Email: [dbeck@illinois.edu](mailto:dbeck@illinois.edu)

**Dr. Kenneth A. Norman**, Ph.D.

Professor, Psychology Department  
Princeton University  
Email: [knorman@princeton.edu](mailto:knorman@princeton.edu)

**Dr. Nicholas B. Turk-Browne**, Ph.D.

Professor, Psychology Department

Yale University

Email: [nicholas.b.turk-browne@yale.edu](mailto:nicholas.b.turk-browne@yale.edu)

**Dr. Fei-Fei Li**, Ph.D.

Professor, Computer Science Department

Stanford University

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