

# Stanford

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## Justin Gardner

Assistant Professor of Psychology

 Curriculum Vitae available Online

### Bio

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#### ACADEMIC APPOINTMENTS

- Assistant Professor, Psychology
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

#### PROGRAM AFFILIATIONS

- Symbolic Systems Program

#### PROFESSIONAL EDUCATION

- PhD, University of California, Berkeley and UCSF , Bioengineering (2002)
- BS, Yale University , Computer Science (1993)

#### LINKS

- Lab website: <http://gru.stanford.edu>

### Research & Scholarship

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#### CURRENT RESEARCH AND SCHOLARLY INTERESTS

How does neural activity in the human cortex create our sense of visual perception? We use a combination of functional magnetic resonance imaging, computational modeling and analysis, and psychophysical measurements to link human perception to cortical brain activity.

### Teaching

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#### COURSES

##### 2019-20

- Brain decoding: PSYCH 164 (Spr)
- Cognitive Neuroscience: PSYCH 202 (Spr)
- Neurosciences Cognitive Core: NEPR 207 (Spr)

##### 2018-19

- Brain Machine Interfaces: Science, Technology, and Application: NSUR 287, PSYCH 287 (Spr)
- Brain decoding: PSYCH 164 (Spr)
- Introduction to Cognitive Neuroscience: PSYCH 50 (Win)

- Neurosciences Cognitive Core: NEPR 207 (Spr)
- Practicum in Teaching: Intro to Cognitive Neuroscience: PSYCH 50A (Win)

#### 2017-18

- Brain Machine Interfaces: Science, Technology, and Application: NSUR 287, PSYCH 287 (Spr)
- Brain decoding: PSYCH 164 (Aut)
- Introduction to Cognitive Neuroscience: PSYCH 50 (Win)
- Neurosciences Cognitive Core: NEPR 207 (Spr)
- Practicum in Teaching: Intro to Cognitive Neuroscience: PSYCH 50A (Win)

#### 2016-17

- Brain Machine Interfaces: Science, Technology, and Application: PSYCH 287 (Spr)
- Brain decoding: PSYCH 164 (Aut)
- Introduction to Cognitive Neuroscience: PSYCH 50 (Win)
- Neurosciences Cognitive Core: NEPR 207 (Spr)
- Practicum in Teaching: Intro to Cognitive Neuroscience: PSYCH 50A (Win)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

Minseung Choi, Corey Fernandez, Arielle Keller, Anna Khazenon, Eshed Margalit, tyler bonnen

#### Orals Chair

Darrel Deo

#### Doctoral Dissertation Advisor (AC)

Akshay Jagadeesh, Minyoung Lee, Guillaume Riesen

#### Master's Program Advisor

Aarush Selvan

#### Doctoral (Program)

Minyoung Lee

## Publications

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### PUBLICATIONS

- **Optimality and heuristics in perceptual neuroscience** *NATURE NEUROSCIENCE*  
Gardner, J. L.  
2019; 22 (4): 514–23
- **A flexible readout mechanism of human sensory representations.** *Nature communications*  
Birman, D., Gardner, J. L.  
2019; 10 (1): 3500
- **Inverted Encoding Models of Human Population Response Conflate Noise and Neural Tuning Width.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*  
Liu, T., Cable, D., Gardner, J. L.  
2018; 38 (2): 398–408
- **A Switching Observer for Human Perceptual Estimation** *Neuron*  
Laquitaine, S., Gardner, J. L.

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2018; 97 (2): 462-474

- **Humans perceive binocular rivalry and fusion in a tristable dynamic state.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*  
Riesen, G., Norcia, A. M., Gardner, J. L.  
2019
- **Computing Social Value Conversion in the Human Brain.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*  
Fukuda, H., Ma, N., Suzuki, S., Harasawa, N., Ueno, K., Gardner, J. L., Ichinohe, N., Haruno, M., Cheng, K., Nakahara, H.  
2019
- **Inverted Encoding Models Reconstruct an Arbitrary Model Response, Not the Stimulus.** *eNeuro*  
Gardner, J. L., Liu, T.  
2019; 6 (2)
- **A quantitative framework for motion visibility in human cortex.** *Journal of neurophysiology*  
Birman, D., Gardner, J. L.  
2018
- **Task-dependent enhancement of facial expression and identity representations in human cortex** *NEUROIMAGE*  
Dobs, K., Schultz, J., Buelthoff, I., Gardner, J. L.  
2018; 172: 689–702
- **Adaptable history biases in human perceptual decisions** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Abrahamyan, A., Silva, L. L., Dakin, S. C., Carandini, M., Gardner, J. L.  
2016; 113 (25): E3548-E3557
- **Parietal and prefrontal: categorical differences?** *Nature neuroscience*  
Birman, D., Gardner, J. L.  
2015; 19 (1): 5-7
- **A CASE FOR HUMAN SYSTEMS NEUROSCIENCE** *NEUROSCIENCE*  
Gardner, J. L.  
2015; 296: 130-137
- **Encoding of graded changes in spatial specificity of prior cues in human visual cortex** *JOURNAL OF NEUROPHYSIOLOGY*  
Hara, Y., Gardner, J. L.  
2014; 112 (11): 2834-2849
- **Differing effects of attention in single-units and populations are well predicted by heterogeneous tuning and the normalization model of attention** *FRONTIERS IN COMPUTATIONAL NEUROSCIENCE*  
Hara, Y., Pestilli, F., Gardner, J. L.  
2014; 8
- **Cortical Correlates of Human Motion Perception Biases** *JOURNAL OF NEUROSCIENCE*  
Vintch, B., Gardner, J. L.  
2014; 34 (7): 2592-2604
- **Functional Signalers of Changes in Visual Stimuli: Cortical Responses to Increments and Decrements in Motion Coherence** *CEREBRAL CORTEX*  
Costagli, M., Ueno, K., Sun, P., Gardner, J. L., Wan, X., Ricciardi, E., Pietrini, P., Tanaka, K., Cheng, K.  
2014; 24 (1): 110-118
- **Demonstration of Tuning to Stimulus Orientation in the Human Visual Cortex: A High-Resolution fMRI Study with a Novel Continuous and Periodic Stimulation Paradigm** *CEREBRAL CORTEX*  
Sun, P., Gardner, J. L., Costagli, M., Ueno, K., Waggoner, R. A., Tanaka, K., Cheng, K.  
2013; 23 (7): 1618-1629
- **Modulation of Visual Responses by Gaze Direction in Human Visual Cortex** *JOURNAL OF NEUROSCIENCE*  
Merriam, E. P., Gardner, J. L., Movshon, J. A., Heeger, D. J.  
2013; 33 (24): 9879-9889

- **Learning to Simulate Others' Decisions** *NEURON*  
Suzuki, S., Harasawa, N., Ueno, K., Gardner, J. L., Ichinohe, N., Haruno, M., Cheng, K., Nakahara, H.  
2012; 74 (6): 1125-1137
- **Attentional Enhancement via Selection and Pooling of Early Sensory Responses in Human Visual Cortex** *NEURON*  
Pestilli, F., Carrasco, M., Heeger, D. J., Gardner, J. L.  
2011; 72 (5): 832-846
- **Feature-Specific Attentional Priority Signals in Human Cortex** *JOURNAL OF NEUROSCIENCE*  
Liu, T., Hospadaruk, L., Zhu, D. C., Gardner, J. L.  
2011; 31 (12): 4484-4495
- **Is cortical vasculature functionally organized?** *NEUROIMAGE*  
Gardner, J. L.  
2010; 49 (3): 1953-1956
- **Differential roles for frontal eye fields (FEFs) and intraparietal sulcus (IPS) in visual working memory and visual attention** *JOURNAL OF VISION*  
Offen, S., Gardner, J. L., Schluppeck, D., Heeger, D. J.  
2010; 10 (11)
- **Executed and Observed Movements Have Different Distributed Representations in Human aIPS** *JOURNAL OF NEUROSCIENCE*  
Dinstein, I., Gardner, J. L., Jazayeri, M., Heeger, D. J.  
2008; 28 (44): 11231-11239
- **Maps of visual space in human occipital cortex are retinotopic, not spatiotopic** *JOURNAL OF NEUROSCIENCE*  
Gardner, J. L., Merriam, E. P., Movshon, J. A., Heeger, D. J.  
2008; 28 (15): 3988-3999
- **A temporal frequency-dependent functional architecture in human V1 revealed by high-resolution fMRI** *NATURE NEUROSCIENCE*  
Sun, P., Ueno, K., Waggoner, R. A., Gardner, J. L., Tanaka, K., Cheng, K.  
2007; 10 (11): 1404-1406
- **Contrast adaptation and representation in human early visual cortex** *NEURON*  
Gardner, J. L., Sun, P., Waggoner, R. A., Ueno, K., Tanaka, K., Cheng, K.  
2005; 47 (4): 607-620
- **A population decoding framework for motion aftereffects on smooth pursuit eye movements** *JOURNAL OF NEUROSCIENCE*  
Gardner, J. L., Tokiyama, S. N., Lisberger, S. G.  
2004; 24 (41): 9035-9048
- **Directional anisotropies reveal a functional segregation of visual motion processing for perception and action** *NEURON*  
Churchland, A. K., Gardner, J. L., Chou, I. H., Priebe, N. J., Lisberger, S. G.  
2003; 37 (6): 1001-1011
- **Serial linkage of target selection for orienting and tracking eye movements** *NATURE NEUROSCIENCE*  
Gardner, J. L., Lisberger, S. G.  
2002; 5 (9): 892-899
- **Linked target selection for saccadic and smooth pursuit eye movements** *JOURNAL OF NEUROSCIENCE*  
Gardner, J. L., Lisberger, S. G.  
2001; 21 (6): 2075-2084
- **Linear and nonlinear contributions to orientation tuning of simple cells in the cat's striate cortex** *VISUAL NEUROSCIENCE*  
Gardner, J. L., Anzai, A., Ohzawa, I., Freeman, R. D.  
1999; 16 (6): 1115-1121