

JINGYANG ZHOU

Center for Computational Neuroscience, Flatiron Institute

160 5th Avenue, NY 10010, USA

jyzhou@flatironinstitute.org

(917) 340-6720

ACADEMIC POSITIONS

Postdoctoral researcher

11/2019 - present

Center for Computational Neuroscience, Flatiron Institute / Center for Neural Science, NYU/ Howard Hughs Medical Institute.

Supervisor: Eero Simoncelli

Research: perceptual theory, computational neuroscience, machine learning.

EDUCATION

Psychology department at New York University

09/2013 - 09/2019

Ph.D in Psychology (Cognition and Perception).

Advisor: Jonathan Winawer.

Research: Neuroimaging, computational models of perceptual and cognitive processing, and object recognition.

Experience: I analyzed data from single-neuron spiking activities, local field potential (LFP), multi-unit activities (MUA), voltage sensitive dye (VSD), genetically-encoded Calcium imaging (GCaMP), fMRI, human Electrocorticography (ECoG), psychophysics and cognitive behavioral experiments. I collected fMRI data.

Coursework: Math tools for computational neuroscience, Signal processing (NYU engineering), image processing, advanced statistics, neuro-imaging methods, and psychophysics.

Mathematics and Economics department at New York University

09/2007 - 01/2012

B.A. in Mathematics and Economics (theory, 2007–2012), *Magna cum laude*.

Research: Topology, theoretical economics and behavioral experiments.

Methods: Building axiomatic models, and design behavioral experiments.

Coursework: Real analysis (undergraduate and Phd-level), topology (undergraduate and Phd-level), abstract algebra (undergraduate), numerical methods (graduate), probability (graduate), linear algebra (graduate), microeconomics theory (graduate).

GRANTS, FELLOWSHIPS, AND AWARDS

Ted Coons Graduate Student Travel Award (\$1000)	2018-2019
NYU Dean's Dissertation Fellowship (\$27526)	2018-2019
Vision Science Society (VSS) Student Travel Award (\$500)	2018
NYU center of imaging token grant (\$5000)	2017
for " <i>Conservation of crowding distance in human hV4.</i> " (Co-PIs: Jonathan Winawer and Dennis Pelli.)	
Ted Coons Graduate Student Travel Award (\$1000)	2016-2017
ACNN (Advanced computational neuroscience network) workshop scholarship	2016
NYU GSAS Dean's student travel grant (\$500)	2016
Henry M. MacCracken scholarship for doctoral study	2013-2018
NYU Dean's Honors List	2007-2011
NYU Dean's undergraduate research fund (DURF) (\$900)	2011
for " <i>a modeling and experimental study of working memory.</i> " (Advisor: Andrew Caplin)	
NYU freshmen and sophomore training grant (FAST) (\$1000)	2008
for " <i>Modeling and simulating addictive behavior.</i> " (Advisor: Ennio Stacchetti)	

Funding/awards to supervised student:

Silvia Choi, Hillary Ann Citrin Award for best Undergraduate Thesis.	2016
for " <i>Temporal Integration and visual object recognition.</i> " Mentored with Jonathan Winawer.	
Silvia Choi, Dean's undergraduate research fund (DURF) (\$1000)	2015
for " <i>Temporal Integration and visual object recognition.</i> " Mentored with Jonathan Winawer.	

SCIENTIFIC PUBLICATIONS

- **Zhou, J.,** Benson, N.C., Kay, K.N. and Winawer. J. *Systematic changes in temporal summation across human visual cortex.* Journal of Neuroscience 30 November 2017, 1724-17; <https://doi.org/10.1523/JNEUROSCI.1724-17.2017>.
- **Zhou, J.,** Benson, N.C., Kay, K.N. and Winawer, J. *Predicting neuronal dynamics with a delayed gain control model.* PLOS computational biology. November 20th 2019. <https://doi.org/10.1371/journal.pcbi.1007484>.

- **Zhou, J.**, Duong, L.R., and Simoncelli, E.P. *A common framework for discriminability and perceived intensity of sensory stimuli*. Under review, 2022. <https://www.biorxiv.org/content/10.1101/2022.04.30.490146v1.full.pdf>.
- **Zhou, J.**, and Chun, C.W. *How does perceptual discriminability relate to neuronal receptive fields?* Under review, 2022. <https://www.biorxiv.org/content/biorxiv/early/2022/12/22/2022.12.21.521510.full.pdf>.
- **Zhou, J.**, Whitmire, M., Chen, Y., and Siedemann, E. *Delayed normalization model captures disparate nonlinear neural dynamics measured with different techniques in macaque and human V1*. Under review, 2023. <https://www.biorxiv.org/content/10.1101/2023.01.30.525700v1.full.pdf>.
- **Zhou, J.** *Quantifying and predicting chromatic threshold*. Submitted to Journal of Vision.

The following are peer-reviewed articles published in conference proceedings. The review process, while less thorough than that for a journal article (in particular, a decision is made after one round of review), is still substantial. Acceptance rates are commonly the rate of 20 - 40%. The published articles are generally available online, and although they are not usually listed in ISI indices, they are widely read and cited in mathematical, engineering and machine learning community.)

- Duong, L.R.*, **Zhou, J.***, Nassar, J., Berman, J., Olieslagers, J., and Williams, A.H. *Representational dissimilarity metric spaces for stochastic neural networks*. Submitted to The International Conference on Learning Representations (ICLR), 2023. <https://arxiv.org/pdf/2211.11665.pdf>. (* indicates co-first authorship.)
- **Zhou, J.**, Chun, C.W., Subramanian, A., and Simoncelli, E. P. *Comparing models of neural representation based on their metric tensors*. Currently submitted to Neurips 2023.

CONFERENCE/WORKSHOP PRESENTATIONS

Talks:

- **Zhou, J.** *Perceptual discriminability and metric properties of representational geometry*. Manhattan representational geometry workshop, January 2023.
- **Zhou, J.**, Whitmire M., Chen, Y. and Siedemann, E. *Near-additive temporal dynamics of sub-threshold population responses in macaque V1*. Vision Science Society Meeting (VSS), May 2022.

- **Zhou, J.**, Duong, L.R., and Simoncelli, E.P. *Metric properties of representation geometries*. Stanford Vision Brunch, January 2022.
- **Zhou, J.**, Duong, L.R., and Simoncelli, E.P. *Fechner and Stevens can co-exist under Fisher's roof*. VSS, 2021.
- Burchell, A., Benson, N.C., **Zhou, J.**, Winawer J., and Pelli D.G. *Using fMRI to link crowding to hV4*. Talk at VSS, May 2019.
- **Zhou, J.**, Benson, N.C., Kay, K.N., and Winawer, J. *Dynamics of temporal summation in human visual cortex*. Talk at VSS symposium "Advances in temporal models of human visual cortex," May 2018.
- **Zhou, J.**, Benson, N.C., Pelli, D., and Winawer, J. *Conservation of crowding distance in human hV4*. Talk presented at Optical Society of America Fall Vision Meeting, October 2017, Washington, DC.

Posters:

- **Zhou, J.**, and Chan, C. W.. *How does perceptual discrimination relate to neuronal receptive fields?* Vision Science Society Annual Meeting, May 2023.
- Duong, L. R., **Zhou, J.**, Nassae, J., Berman, J., Olieslagers, J., and Williams, A. *Representational dissimilarity metric spaces for stochastic neural networks*. The International Conference on Learning Representations (ICLR). May 2023, Rwanda.
- **Zhou, J.**, Duong, L.R., Nassae, J., Berman, J., Olieslagers, J., and Williams, A. *Representational dissimilarity metric spaces for stochastic neural networks*. Computational and Systems Neuroscience (COSYNE) 2023, Montreal and Mont Tremblant, Quebec, Canada. March 2023.
- **Zhou, J.**, Duong, L.R., and Simoncelli, E.P. *Relating percept to perceptual sensitivity using Fisher information*. Poster presented at Society for Neuroscience meeting, November 2021.
- Groen IIA, **Zhou J.**, Piantoni G., Hermes D., Flinker A., Devinsky O., Doyle W., Ramsey N., Petridou N., Winawer J. *The temporal dynamics of neuronal responses in human visual cortex*. OHBM (Organization for Human Brain Mapping) 2019.
- Groen IIA, **Zhou J.**, Hermes D, Kay KN, and Winawer J. *Simulation and recovery of broadband field potentials*. SFN 2018.

- **Zhou, J.**, Benson, N.C., Pelli, D., and Winawer, J. *Conservation of crowding distance in human hV4*. Poster presented at Vision Science Society Annual Meeting, May 2018.
- Schellekens, W., **Zhou, J.**, Siero, J., Benson, N., Groen, I., Piantoni, G., Devinsky, O., Petridou, N., Ramsey, N.F., Winawer, J. *Extending Population Receptive fields to new domains*. April 2018. The 4th Annual BRAIN Initiative Investigators Meeting, NIH.
- Kay, K.N., Winawer, J., **Zhou, J.**, Sertel, M., Yoshor, D. and Beauchamp, M. *The dynamics of top-down modulation in human visual cortex*. Society for Neuroscience meeting, 2017, Washington DC.
- **Zhou, J.**, Choi, S., and Winawer, J. *Temporal windows in psychophysical discrimination and in neural responses in human visual cortex*. Poster presented at Vision Science Society Annual Meeting, May 2017.
- Choi, S., **Zhou, J.**, and Winawer, J. *Temporal integration and visual object recognition*. Undergraduate research conference at NYU, May 2016.
- **Zhou, J.**, Benson, N.C., Kay, K.N., and Winawer, J. *Temporal summation and Adaptation in Human Visual Cortex*. Poster presented at Vision Science Society Annual Meeting, May 2016.

GENERAL PUBLICATIONS

Zhou, J. *Geometry and How We See the World — a book review on Amir Alexander’s “Proof! How the World Became Geometrical.”* The Cooper Square Review, April 2020. <http://coopersquarereview.org/review/geometry-and-how-we-see-the-world/>.

TEACHING EXPERIENCE

Teaching assistant , undergraduate <i>Perception</i> at NYU	Fall 2016
Instructor , undergraduate <i>Perception</i> at NYU	Summer 2017
Grader , undergraduate <i>Calculus I— III</i> and <i>linear algebra</i> at NYU	2008 - 2011
Organizer , Manhattan Representational Geometry workshop	January 2023

TRAINING

Cold Spring Harbor Computational Neuroscience: Vision	Summer 2018
Science Communication Workshop (hosted by Stephen Hall), NYU	Spring 2016

PROFESSIONAL ACTIVITIES

- Organizing **Vision Journal Club** at NYU
 - with Hormet Yiltiz 2016 - 2017
 - by myself 2017 - 2019
 - with Kathryn Bonnen 2019 - 2021
 - With Robert Woodry 2021- present
- Organizing **Manhattan Representational Geometry workshop** with Niko Kriegeskorte, Xuexin Wei and Heiko Schutt (January, 2023).
- Interview for the **Flatiron Scientist Spotlight Series**. [Link](#) to the interview. January, 2023.

PROFESSIONAL ORGANIZATIONS

Vision Science Society
Society for Neuroscience