

ZOE M. BOUNDY-SINGER

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EDUCATION

University of Texas at Austin Neuroscience PhD candidate Committee: Robbe Goris, Wilson Geisler, Alex Huk, Xue-Xin Wei, & Samantha Santacruz Thesis: Representation of uncertainty in macaque visual cortex	<i>09/17 – Present</i>
University of Chicago Bachelor of Science with Honors Major: Biology ♦ Neuroscience Specialization Minor: Computational Neuroscience Thesis: Speed invariance of texture perception	<i>09/12 – 06/16</i>
Cold Spring Harbor Labs Neuroscience: Computational Vision Course attendee	<i>07/22</i>

RESEARCH EXPERIENCE

Graduate student advised by Robbe Goris <i>University of Texas at Austin – Center for Perceptual Systems</i> Project: Representation of uncertainty in macaque visual cortex	<i>01/18 – Present</i>
Rotation student advised by Thibaud Tallefumier <i>University of Texas at Austin – Department of Neuroscience and Mathematics</i> Project: Optimal tuning curves for efficient coding	<i>09/17 – 12/17</i>
Research assistant & summer intern advised by Sliman Bensmaia <i>University of Chicago – Department of Organismal Biology and Anatomy</i> Project: Speed invariance of texture perception	<i>10/13 – 09/16</i>

AWARDS AND HONORS

UT Austin Center for Perceptual Systems Research Excellence Award	<i>06/23</i>
Plexon Neuroscience Presenter Award	<i>10/22</i>
University Graduate Continuing Fellowship, UT Austin (<i>covers stipend + tuition</i>)	<i>09/22 – 08/23</i>
COSYNE Presenters Travel Grant	<i>03/22</i>
Professional Development Award from the Graduate School, UT Austin	<i>10/19, 10/21, & 11/22</i>
National Science Foundation Graduate Research Fellowship (NSF-GRFP)	<i>08/19 – 07/22</i>
UT Austin Institute for Neuroscience (INS) training grant recipient	<i>09/17 – 07/19</i>
University of Chicago - Dean's list scholar	<i>09/12 – 06/16</i>

PUBLICATIONS

- Boundy-Singer, Z. M.***, Ziemba, C. M.*, Goris, R.T.L. Confidence as a noisy decision reliability estimate. *Nature Human Behavior*. (2023).
- Hénaff, O., **Boundy-Singer, Z. M.**, Meding, K., Ziemba, C. M., Goris, R.T.L. Representation of visual uncertainty through neural gain variability. *Nature Communications* 11, 2531 (2020).
- Boundy-Singer, Z. M.**, Saal, H.P., Bensmaia, S. J. Speed Invariance of Texture Perception. *Journal of Neurophysiology* 118(4), 2371-2377 (2017).

PREPRINTS

Boundy-Singer, Z. M., Ziemba, C. M., Hénaff, O., Goris, R.T.L. How does V1 population activity inform perceptual certainty? bioRxiv. doi: 10.1101/2023.09.08.556926

TALKS

- Society for Neuroscience minisymposium: 11/23
Suppression and Variability in Visual Cortex
Title: The representation of visual uncertainty in V1 population activity.
- Vision Science Society (VSS) selected talk 05/23
Title: Relating V1 population activity to perceptual orientation uncertainty.
- COSYNE Workshops: 03/23
Computational mechanisms underlying decision uncertainty and confidence in brain and behavior
Title: Perceptual confidence: computational and physiological mechanism
- INS Dialogues, UT Austin 02/22
Title: Decision confidence: computational and physiological mechanism
- Center for Perceptual Systems Seminar Series, UT Austin 11/21
Title: Representation of uncertainty by macaque V1 populations
- UT Austin INS recruitment talk 02/20
Title: Uncertainty in the primate visual system
- UT Austin INS recruitment talk 02/18
Title: Optimal tuning curves for efficient coding

POSTERS

Presenting author:

- Boundy-Singer, Z. M.**, Raj, A., Ziemba, C. M., Goris, R.L.T. Recipes for improving perceptual confidence with practice. (November, 2023). Society for Neuroscience. Washington, D.C.
- Boundy-Singer, Z. M.**, Ziemba, C. M., Goris, R.L.T. Relating V1 population activity to perceptual orientation uncertainty. (March, 2023). COSYNE. Montreal, Canada.
- Boundy-Singer, Z. M.**, Ziemba, C. M., Goris, R.L.T. Relating V1 population activity to perceptual orientation uncertainty. (November, 2022). Society for Neuroscience. San Diego, CA.
- Boundy-Singer, Z. M.**, Ziemba, C. M., Goris, R.L.T. Representation of Uncertainty by Macaque V1 Populations. (March, 2022). COSYNE. Lisbon, Portugal.
- Boundy-Singer, Z. M.**, Ziemba, C. M., Goris, R.L.T. Representation of Uncertainty by Macaque V1 Populations. (November, 2021). Society for Neuroscience. Virtual.
- Boundy-Singer, Z. M.**, Hénaff, O., Meding, K., Ziemba, C. M., Goris, R.L.T. Representation of Sensory Uncertainty in Macaque Visual Cortex. (February, 2020). COSYNE. Denver, CO.
- Boundy-Singer, Z. M.**, Ziemba, C. M., Goris, R.L.T. Incentivizing, dissecting, and modeling human confidence judgments (October, 2019). Society for Neuroscience. Chicago, IL.
- Boundy-Singer, Z. M.**, Ziemba, C. M., Goris, R.L.T. (April, 2019). Incentivizing, dissecting, and modeling human confidence judgments. NETI. Austin, TX.

Contributing author:

- Ziemba, C. M, **Boundy-Singer, Z. M.**, Goris, R.L.T. Decoding momentary gain variability from neuronal populations. (March, 2023). COSYNE. Montreal, Canada.

Ziemba, C. M, **Boundy-Singer, Z. M.**, Goris, R.L.T. Isolating metacognitive sensitivity with a process model for confidence. (November, 2021). Society for Neuroscience. Virtual.

Saal, H. P., Lieber, J. D., **Boundy-Singer, Z. M.**, Weber, A. I., Bensmaia, S. J. (November, 2016). Inferring the neural representations underlying perceptual invariance in touch. Society for Neuroscience. San Diego, CA.

Lieber, J. D., Saal, H. P., **Boundy-Singer, Z. M.**, Weber, A. I., Bensmaia, S. J. (November, 2016). The coding of natural textures in primate somatosensory cortex. Society for Neuroscience. San Diego, CA.

Saal, H. P., Lieber, J. D., **Boundy-Singer, Z. M.**, Weber, A. I., Bensmaia, S. J. (October, 2015). Tactile texture invariance and its peripheral neural basis. Society for Neuroscience. Chicago, IL.

OUTREACH

SURE (Summer Undergraduate Research Experience) mentor, UT Austin 06/23 - 08/23
Program aimed at exposing students from underrepresented backgrounds to research.
Schrödinger's Pint: public science talk series (*lecturer*) 05/23
Present Your PhD Program: Youth Science Workshop, UT Austin (*presenter*) 05/22
Health Science Summer Camps, UT Austin (*lecturer*) 07/18
UT Austin Neuroscience Undergraduate Reading Program Mentor (NURP) 01/18 - 5/20
Semesterly program in which mentors guide mentees in a neuroscience topic via primary literature review
University of Chicago NEURO Club 09/13 - 06/16
Member of the neuroscience club who's mission is to bring neuroscience education to community members of all ages and backgrounds.

MENTORSHIP

UT Austin:
Quiana Jeffs, Ivan Zambrano, Nick Bastia, Ryan Truong Goris Lab Undergraduate RA
Elijah Johnson , Emily Andrade SURE
Rebecca Moore, Thomas Jensen, Khue Tran, Che-Wei Chou, NURP
Mareena Zaheer, Michael Darmawan, Maher Rahman

University of Chicago:
Molly O'Donnell, Katherine Reis Bensmaia Lab Undergraduate RA

TEACHING

Instructor INS Bootcamp psychophysics module – UT Austin 8/22 & 23
Teaching assistant for PSY 194 – Ethics and Professional Development – UT Austin Spring 21 & 22
Responsibilities included curating weekly reading assignments, giving topical lectures, and leading class discussions

MEMBERSHIPS

Society for Neuroscience 09/15 – Present

SKILLS

MATLAB, Python, R programming language, LaTeX, Adobe Illustrator