ZOE M. BOUNDY-SINGER

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Austin, TX 78712

EDUCATION

University of Texas at Austin *09/17 – 05/24*
PhD Neuroscience
Committee: Robbe Goris, Wilson Geisler, Alex Huk, Xue-Xin Wei, & Samantha Santacruz
Thesis: Perceptual uncertainty and confidence: computational and physiological mechanisms

University of Chicago *09/12 – 06/16*
Bachelor of Science with Honors
Major: Biology ⋄ Neuroscience Specialization
Minor: Computational Neuroscience
Thesis: Speed invariance of texture perception

Cold Spring Harbor Labs Neuroscience: Computational Vision *07/22*
Course attendee

RESEARCH POSITIONS

Postdoc advised by Mehrdad Jazayeri *07/24 – Present*
MIT – Department of Brain and Cognitive Sciences

Graduate student advised by Robbe Goris *01/18 – 06/24*
University of Texas at Austin – Center for Perceptual Systems
Project: Representation of uncertainty in macaque visual cortex

Rotation student advised by Thibaud Taillefumier *09/17 – 12/17*
University of Texas at Austin – Department of Neuroscience and Mathematics
Project: Optimal tuning curves for efficient coding

Research assistant & summer intern advised by Sliman Bensmaia *10/13 – 09/16*
University of Chicago – Department of Organismal Biology and Anatomy
Project: Speed invariance of texture perception

FELLOWSHIPS AND AWARDS

25^{th} Anniversary McGovern Institute Postdoctoral Associate Fellowship, MIT *07/24 – 07/25*
UT Austin Center for Perceptual Systems training grant recipient *09/23 – 06/24*
UT Austin Center for Perceptual Systems Research Excellence Award *06/23*
Plexon Neuroscience Presenter Award *10/22*
University Graduate Continuing Fellowship, UT Austin *(covers stipend + tuition)* *09/22 – 08/23*
COSYNE Presenters Travel Grant *03/22*
Professional Development Award from the Graduate School, UT Austin *10/19, 10/21, & 11/22*
National Science Foundation Graduate Research Fellowship (NSF–GRFP) *08/19 – 07/22*
UT Austin Institute for Neuroscience (INS) training grant recipient *09/17 – 07/19*
University of Chicago - Dean's list scholar *09/12 – 06/16*

PUBLICATIONS

Boundy-Singer, Z. M., Ziemba, C. M., Hénaff, O., Goris, R.T.L. How does V1 population activity inform perceptual certainty? Journal of Vision. 24(12), 12-12 (2024).

Boundy-Singer, Z. M.*, Ziemba, C. M.*, Goris, R.T.L. Confidence as a noisy decision reliability estimate. Nature Human Behavior. 7, 142–154 (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).

IN PREPARATION

Boundy-Singer, Z. M., Ziemba, C. M., Goris, R.T.L. Sensory population activity reveals confidence computations in the primate visual system (2024).

Boundy-Singer, Z. M., Raj G P, A., Ziemba, C. M., Goris, R.T.L. Improving metacognitive ability with practice (2024).

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

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:
Plate, C., **Boundy-Singer, Z. M.**, Ziemba, C. M. Estimating and integrating the uncertainty of naturalistic stimuli. (November, 2023). Society for Neuroscience. Washington, D.C.

Govil, D., Pizarro, R., Renfro A., Plate, C., **Boundy-Singer, Z. M.**, Ziemba, C. M. Lopez-Guzman, S. Is metacognitive ability conserved across perceptual and value-based decision-making? (November, 2023). Society for Neuroscience. Washington, D.C.

Raymond, C., Pizarro, R., Renfro A., Plate, C., **Boundy-Singer, Z. M.**, Ziemba, C. M., Lopez-Guzman, S. Identifying the influence of risk preferences on incentivized reports of perceptual confidence. (November, 2023). Society for Neuroscience. Washington, D.C.

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:
Akash Raj — *Goris Lab graduate student*
Quiana Jeffs, Ivan Zambrano, Nick Bastia, Ryan Truong — *Goris Lab undergraduate RA*
Elijah Johnson, Emily Andrade — *SURE*
Rebbeca Moore, Thomas Jensen, Khue Tran, Che-Wei Chou, Mareena Zaheer, Michael Darmawan, Maher Rahman — *NURP*

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