SRIHITA RUDRARAJU

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EDUCATION

PhD., Experimental Psychology, Expected 2023 | **MS.**, Bioengineering, 2019
University of California San Diego, Advisor: Timothy Gentner
BTech. (Hons) & MTech., Biotechnology, 2016
Indian Institute of Technology Madras, Advisor: Devarajan Karunagaran

TECHNICAL SKILLS

Programming/Software: Python (NumPy, SciPy, Pandas, scikit-learn, Keras), MATLAB, R, Deep
learning frameworks (TensorFlow, PyTorch, Theano), Git, C/C++, SQL
Hardware: OpenEphys, Raspberry Pi

PUBLICATIONS, PROCEEDINGS AND PREPRINTS

Rudraraju, S., Theilman, B.H., Turvey, M.E., & Gentner, T.Q. *(in preparation)* Predictive coding in the primary and secondary auditory cortical neurons of songbirds.

Theilman, B.H., Turvey, M.E., **Rudraraju, S.**, & Gentner, T.Q. (in submission) Direct representation of stimulus space geometry by temporal coactivity patterns in neural populations,

Sainburg, T., McPherson, T., Arneodo, E., **Rudraraju, S.**, & Gentner, T.Q. (in submission) Sensory physiology and perceptual mechanisms underlying learning context dependent categorical perception of birdsong sequences.

Vahidi, N. W., **Rudraraju, S.**, Castagnola, E., Cea, C., Nimbalkar, S., Hanna, R., Arvizu, R., Dayeh, S. A., Gentner, T. Q., & Kassegne, S. (2020). Epi-Intra neural probes with glassy carbon microelectrodes help elucidate neural coding and stimulus encoding in 3D volume of tissue. *Journal of Neural Engineering, 17*(4), 046005.

Castagnola, E., Vahidi, N. W., Nimbalkar, S., **Rudraraju, S.**, Thielk, M., Zucchini, E., Cea, C., Carli, S., Gentner, T. Q., Ricci, D., Fadiga, L., & Kassegne, S. (2018). In Vivo Dopamine Detection and Single Unit Recordings Using Intracortical Glassy Carbon Microelectrode Arrays. *MRS Advances, 3*(29), 1629–1634.

TALKS AND POSTERS

Srihita Rudraraju, "Tools to investigate predictive coding in the auditory cortex", *IEEE Women in Engineering*, Perú, 2021. ***(Invited Talk)***

Srihita Rudraraju, Brad Theilman, and Timothy Q. Gentner, "Predictive coding in songbird secondary auditory cortical neurons", *Society for Neuroscience 2021 (SfN)*, 2021. ***(Poster)***

Brad Theilman, **Srihita Rudraraju,** and Timothy Gentner, "Reconstruction of natural auditory stimuli from neuronal population activity", *Society for Neuroscience 2021 (SfN)*, 2021. ***(Poster)***

Srihita Rudraraju, and Timothy Q. Gentner, "Predictive coding in the auditory cortex", *CNSL Meet*, 2020. ***(Poster)***

PROFESSIONAL EXPERIENCE

Graduate Student Researcher, Auditory Neuroscience Lab	**Apr 2017 - Present**
University of California San Diego	*Advisor: Timothy Gentner*

▪ Predictive coding in the auditory system of songbirds

Graduate Student Rotation, Auditory Neuroscience Lab	**Oct 2016 – Mar 2017**
University of California San Diego	*Advisor: Gabriel Silva*

▪ Dynamics of neural networks in *C. elegans*

Undergraduate Researcher

▪ Role of microRNA-7-5p in tumor progression in cancer.

Cancer Biology Lab, IIT Madras	Jun 2015 – Jun 2016

▪ Eco-friendly water desalinator based on microbial desalination technique.
Microbiology Lab, IIT Madras   Dec 2014 – Jun 2016
▪ S100P derived RAGE antagonist peptide (RAP) reduces tumor growth in pancreatic cancer.
Logsdon Lab, MD Anderson Cancer Center   Jun 2014 – Aug 2014

SELECTED PROJECTS

Predictive Coding in the Auditory System – PhD Thesis   **April 2017 - Present**

▪ Showed evidence for the **predictive coding hypothesis**, a powerful theoretical framework employed to explain perceptual and cognitive phenomena, in single cortical neurons.

▪ Using **machine learning** techniques such as **convolutional, recurrent networks and transformer models** and **statistical methods** to develop generative models of incoming sensory signals.

▪ Performing **multi-electrode electrophysiology** to record and **signal processing** extracellular neural activity from auditory neurons in songbirds.

▪ Exploring mapping from spectro-temporal signal of speech to a corresponding set of discrete phonetic features to understand **real-world speech perception** (underway for submission at NeurIPS 2022).

▪ Studying mechanisms underlying **learning temporal pattern recognition** in songbirds.

▪ Managed collaborations with three labs in different fields. Facilitated communication by regularly providing project updates using **data visualization** and **scientific illustrations**.

SELECTED HONORS AND AWARDS

▪ 2021, **Norman Anderson Travel and Research Award**, Dept. of Psychology, UC San Diego.
▪ 2016, **Honors in Biotechnology**, IIT Madras

MENTORSHIP AND LEADERSHIP EXPERIENCE

Clubes de Ciencia (Science Clubs) Instructor, Mexico & Peru | Undergraduate Mentor (4 students) | Citizen Science Club Organizer, Psychology | Teaching Assistant, Bioengineering & Psychology