Rajvi Agravat

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EDUCATION

The University of Texas at Austin Aug 2026
Ph.D. Neuroscience

New York Institute of Technology May 2020
B.S. Biology

SKILLS

- Programming: Python, MNE-Python, R
- Machine Learning & Computational Modeling: Encoding and decoding models, linear/multivariate regression, multi-temporal (MTRF) & spatiotemporal (STRF) receptive field modeling, regularization, model validation
- Data Analysis & Statistics: Signal processing, time-frequency analysis, spectral analysis, filtering, artifact removal, independent-component analysis (ICA), principal-component analysis (PCA), power analysis, hypothesis testing, Linear Mixed-Effects Regression (LMER)
- Neuroscience Techniques: Intracranial EEG (stereo-EEG), scalp EEG data collection & analysis
- Software & Tools: EEG/MRI Tools, FreeSurfer, Qualtrics (for surveys/experiments), Git
- Audio Processing: Adobe Audition, Audacity, Praat (acoustic analysis), Moises, MVSEP, AudioShake, GAUDIO studio, NeuralMixPro (for source separation)
- Visualization: Adobe Illustrator, Figma, Python (Matplotlib, seaborn), R (ggplot)

EXPERIENCE

Ph.D. Researcher, The University of Texas at Austin, TX May 2023 – Present
Hamilton Lab, Advisor: Dr. Liberty Hamilton

- Analyzed 500+ hours of high-dimensional direct brain recordings during naturalistic speech and music using encoding models to uncover insights on implicit attention, speech prioritization, and acoustic feature processing.
- Used DNN based source separation and spectrotemporal receptive field models to predict how the auditory cortex represents mixed speech and music sounds, like in movie clips [1, 3, 4, 6].
- Designed game-based paradigms to evaluate how explicit auditory attention changes speech prioritization over music in children and adolescents, using intracranial EEG.
- Drafted IRB protocols while ensuring ethical compliance and patient data privacy.
- Collaborated with cross-functional teams at multiple universities and hospitals to develop study protocols for large-scale neurophysiological data collection and analysis.

Graduate Research Assistant, The University of Texas at Austin, TX Jan 2023 – May 2023
Developmental Cognitive Neuroscience Lab, Advisor: Dr. Jessica Church-Lang

- Analyzed high-dimensional fMRI data to investigate the development of executive function in children, revealing that earlier deficits in executive function predict later ADHD burden, eventually providing actionable insights for policymakers to guide classroom interventions.
- Managed big data and built a data processing pipeline to initiate large-scale data transfer using Texas Advanced Computing Center (TACC) in the Brain Imaging Data Structure (BIDS) format.

Research Assistant, The Rockefeller University, NY Aug 2020 – Jun 2022
Lab of Neurogenetics of Language, Advisor: Dr. Erich Jarvis

- Mapped auditory-motor connectivity of vocalization circuits in mice using electron confocal imaging and iDISCO tissue clearing, contributing to foundational understanding of sensory circuit integration [2, 6, 7].
- Quantified vocal circuit connectivity and motor cortex function using neuronal tracing, cell density analysis (ImageJ, Imaris), and 3D modeling (Python).

ADDITIONAL TRAINING

Analyzing, Presenting Data/Information. Edward Tufte. 2025
Genetics & Neurobiology of Language. Cold Spring Harbor Laboratories. 2024

AWARDS AND HONORS

- APAN Travel Award Winner for best talk *($750)* 2025
- Graduate Student Professional Development Award, UT Austin *($330)* 2025

- Graduate Student & Reimagining Professional Development Award, UT Austin *($1200)* 2024
- INS & SLHS Travel Awards, Cold Spring Harbor Lab: Genetics and Neurobiology of Language *($3400)* 2024
- Texas SLH Foundation (TSHA) Elizabeth Wiig Research Award *($1000)* 2024
- UT INS Graduate Fellowship *($40,000 per year)* 2022 – 2027
- Dr. Barbu Kestanband Annual Scholarship *($5000)* 2018
- The NYIT Scholarship *($64,000 total)* 2016 – 2020
- NYIT Dean's List Spring '17, '18, '19, '20
- NYIT Presidential Honor's List 2019

SERVICE

- Cellular to Clinical Applied Rehab Research and Engineering, UT Austin, TX Nov 2023 – Present
  Advisory Board Member
- Speech, Language, & Hearing Sciences, UT Austin, TX Spring 2025
  Graduate Teaching Assistant, SLH350: Language & the Brain (160+ students)
- SAGES Women in STEM + STEM Muse Mentorship Program, UT Austin, TX Feb – Jul 2023
  Mentor (Undergraduate Mentee: Melis Demiralp)
- Neuroscience Undergraduate Reading Program (NURP), UT Austin, TX Jan – Apr 2023
  Graduate Student Mentor (Undergraduate Mentee: Ai-Vy Le)
- Biology Academic Conference for Emerging Scholars (BioAcCES) Oct 2021
  Reviewer

MANUSCRIPTS UNDER PREPARATION

[1] **Agravat, R. K.,** Desai, M, Field, A. M, Foox, G, Georges, S, Leisawitz, J, Asghar, S, Anderson, A. E, Clarke, D, Tyler-Kabara, E. C, Watrous, A. J, Weiner, H. L, Hamilton, L. S. Auditory cortex preferentially tracks speech over music without explicit attention *(in prep.)*

[2] Vargas, C. D. M.*, **Agravat, R. K.***, Waidmann, E. N.*, Bochalis, C., Bermudez, H., Giannakopoulos, T., & Jarvis, E. D. (2024). A Functional and Non-Homuncular Representation of the Larynx in the Primary Motor Cortex of Mice, a Vocal Non-Learner. In bioRxiv (p. 2024.02.05.579004). https://doi.org/10.1101/2024.02.05.579004 *(pre-print)*
* shared first authorship

PRESENTATIONS

[3] **R. Agravat**, M. Desai, G. Foox, A. Field, A. Watrous, A. Anderson, D. Clarke, E. T. Kabara, H. Weiner, L. Hamilton. Auditory Cortex Preferentially Tracks Speech Over Music without Explicit Attention.
- *Electronic Auditory Research Seminars (E.A.R.S.). 2025. Virtual.* [talk]

[4] **R. Agravat**, M. Desai, G. Foox, A. Field, A. Watrous, A. Anderson, D. Clarke, E. T. Kabara, H. Weiner, L. Hamilton. Direct Brain Recordings Show Neural Prioritization of Speech Over Music in Children.
- *Society for Neurobiology of Language (SNL), 2025. Washington, DC.* [poster]
- *Berkeley Neuroscience Conference, 2025. Lake Tahoe, CA.* [poster]
- *LLMs & the Brain, 2025. Houston, TX.* [lightning talk + poster]
- *Advances and Perspectives in Auditory Neuroscience (APAN), 2025. San Diego, CA.* [selected podium talk in lieu of poster; *$750* travel award winner for best talk]
- *Society for Neuroscience (SfN), 2025. San Diego, CA.* [abstract selected for press conference, top 0.5%]

[5] **R. Agravat**, M. Desai, G. Foox, A. Field, A. Anderson, D. Clarke, E. T. Kabara, H. Weiner, L. Hamilton. Neural Encoding of Acoustic Features Across Speech and Music in the Human Brain.
- *The University of Texas System-wide Brain Research Summit, 2024. Austin, TX.* [poster]
- *Advances and Perspectives in Auditory Neuroscience (APAN), 2024. Chicago, IL.* [poster]
- *Society for Neuroscience (SfN), 2024. Chicago, IL.* [poster]

[6] **R. Agravat**, M. Desai, G. Foox, A. Field, A. Anderson, D. Clarke, E. T. Kabara, H. Weiner, L. Hamilton. Comparing Speech and Music Encoding Models.
- *UT Austin Cellular and Clinical Applied Rehabilitation Research and Engineering Research Day, 2024. Austin, TX.* [poster]

[7] C.D.M. Vargas, **R. Agravat**, E. Jarvis. Mouse Motor Cortex Can Influence Vocal Musculature.
- *Society for Neuroscience (SfN), 2022. San Diego, CA.* [poster]

[8] **R. Agravat**, C.D.M. Vargas, E. Jarvis. Connectivity and Neuroanatomy of the Orofacial Motor Cortex and Laryngeal Motor Cortex for Vocal Modulation in Mice.
- *Society for Neuroscience (SfN), 2021. Chicago, IL.* [poster]