

# Irmak Ergin

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## PhD Candidate - Computational Cognitive Neuroscience

Gwilliams Lab of Speech Neuroscience, Stanford University

### Education

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#### Stanford University, USA

**Ph.D. in Psychology – Neuroscience Track**

2023–Present

Supervisor: Dr. Laura Gwilliams

3rd year, Anticipated graduation date: 06/2028

#### University of Trento (CIMeC) / SISSA, Italy

**M.Sc. in Cognitive Science – Neuroscience Track**

2021–2023

Grade: 110/110

Supervisors: Dr. Daniel Baldauf & Dr. Davide Crepaldi

#### Bogazici University, Turkey

**B.A. in Psychology**

2015–2021

Honors

Supervisors: Dr. Resit Canbeyli & Dr. Aysecan Boduroglu

### Research Experience

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#### PhD Candidate, Stanford University

Palo Alto, CA

2021–2023

- Investigating neural mechanisms of speech processing by analyzing rare large-scale single-neuron Utah array recordings obtained from human motor cortex and Broca's area from a BCI patient. This work leverages state-of-the-art speech and language models, using embeddings and mapping methods for spatio-temporal neural analysis.
- Designed, developed, and validated a novel scanner-compatible slider device that synchronizes with neural and behavioral recording software, enabling millisecond-resolution simultaneous measurement of physiology and behavior.

#### MSc Researcher, Center for Mind/Brain Sciences

Trento, Italy

2023–Present

- Analyzing MEG data to study neural synchronization and connectivity in auditory attention and object recognition; conducted data preprocessing, ROI detection, and connectivity analysis for linguistic and environmental auditory stimuli.

#### Intern, NYU-MPI Center for Language Music and Emotion (CLaME)

NYC, USA

Summer 2021

- Applied timeseries analysis (e.g., Phase Locking Analysis) to EEG data to investigate neural mechanisms underlying musical tension.

## Technical Skills

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**Programming:** Python, MATLAB, R

**Neuroimaging Methods:** Utah Arrays, MEG, EEG

**Computational Neuroscience & Signal Processing:** dimensionality reduction, cross-validated regression, noise reduction, Fourier transform, source localization

**Machine Learning & Data Analysis:** scikit-learn, SciPy, NumPy, Pandas, librosa, pysptk, Brainstorm, FieldTrip, Psychtoolbox

**Deep Learning Frameworks:** PyTorch

**Visualization:** Matplotlib, Seaborn, Plotly

**Tools:** Git, Jupyter Notebook

## Awards and Scholarships

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Stanford Data Science Scholar	2025–2027
Stanford Center for Mind, Brain, Computation, & Technology Fellowship	2024–2026
Fulbright Graduate Degree Scholarship <i>[declined]</i>	2023–2026
UniTrento-SISSA Master's Degree Scholarship	2021–2023
German Academic Exchange Service (DAAD) Scholarship <i>[declined]</i>	2021–2023
TÜBİTAK National Scholarship for Undergraduate Researchers	2021
European Union Erasmus+ Grant	2020

## Publications

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**Ergin, I.**, Kries, J., Gupta, S., & Gwilliams, L. (2024). *Measuring Naturalistic Speech Comprehension in Real Time* [in press]. [\[pdf\]](#)

Boyce, V., Prystawski, B., Abutto, A. B., Chen, E. M., Chen, Z., Chiu, H., **Ergin, I.**, ..., Frank, M. C. (2024). *Estimating the replicability of psychology experiments after an initial failure to replicate*. [\[pdf\]](#)

## Conference Poster Presentations

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**Ergin, I.**, Kries, J., Gupta, S., & Gwilliams, L. (2024). Introducing A Real-Time Measure of Comprehension During Natural Speech Listening. *Society of Neurobiology of Language*, Brisbane, Australia.

**Ergin, I.**, Padovani, F., Marelli, M., Crepaldi, D., & Ktori, M. (2024). Morpheme Positional

Constraints and Grammatical Class. *California Meeting on Psycholinguistics (CAMP)*, Stanford, USA.

**Ergin, I.**, Canbeyli, R. (2021). Associations in Response to Compound and Reversible Words in Bilinguals. *49th Meeting of the European Brain and Behavior Society*, Lausanne, Switzerland.

## Relevant PhD Coursework

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CS 224S: Spoken Language Processing

CS 224N: Natural Language Processing with Deep Learning

NEPR 209: Mathematical Tools in Neuroscience

## Teaching

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*TA, Introduction to Cognitive Neuroscience (PSYCH 50)*

*Winter 2026*

with Prof. Justin Gardner

*TA & Guest Lecturer, Experimental Methods (PSYCH 251)*

*Fall 2025*

with Prof. Michael Frank

*TA & Guest Lecturer, Data Science for Neuroscience (DATASCI 149N)*

*Winter 2025*

with Prof. Laura Gwilliams

*TA & Guest Lecturer, Introduction to Psycholinguistics (PSYCH 140 / LINGUIST 145) Fall 2024*

with Prof. Cory Shain