Ya-Ning (Yanni) Wu

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Areas of Interest

• Audio Signal Processing
• Machine Learning & Neural Decoding
• Empirical Mode Decomposition (EMD)
• Cognitive Neuroscience
• Speech and Language Processing

Personal Summary

Motivated graduate student in Cognitive Sciences with a strong interdisciplinary background in **auditory and language neuroscience**. I am experienced in designing and implementing advanced data analysis pipelines—including machine learning models and nonlinear signal decomposition techniques—to decode neural signals from magnetoencephalography (MEG) data. I am passionate about applying innovative audio processing methods to real-world problems, with a proven track record of research and publications in neural decoding and auditory perception. Seeking to leverage technical expertise and research experience in a dynamic internship role.

Education

University of California, Irvine
PhD Program in Cognitive Sciences | Sep. 2022 – Present
• Cumulative GPA: 3.97/4.00
• Research focus: Functional anatomy of speech production processes, with projects on altered auditory feedback (humans), and rhythm-coordinated systems (robots).

University of California, San Diego
BS in Cognitive Behavioral Neuroscience (Magna Cum Laude) | Sep. 2016 – Jun. 2019
• Cumulative GPA: 3.93/4.00
• Graduated with department honors and quarterly provost's honors.

Work Experience

Brain and Language Laboratory, National Central University
Research Assistant | Aug. 2019 – Mar. 2022
• Collected and analyzed MEG/EEG data using MNE-Python and Matlab for neural decoding studies.
• Applied machine learning and nonlinear signal decomposition (e.g., Empirical Mode Decomposition) to enhance the detection of neural patterns in auditory and speech signals.
• Supported projects on auditory speech signal denoising, decomposition.

UCSD Center for Research in Language
Research Assistant | Aug. 2017 – Jun. 2019
• Conducted an honors thesis on sound symbolism and assisted in projects on

morphological complexity using artificial language models.
• Developed data analysis pipeline in R to support research in language processing and auditory perception.

National Taiwan University Neuroanatomy Lab
Summer Research Intern | Jun. 2018 – Sep. 2018
• Assisted in experimental research on neural development and subplate neuron mapping using advanced staining and imaging techniques.

George Lab, The Scripps Research Institute
Research Assistant | Apr. 2018 – Dec. 2018
• Supported research on alcohol addiction and treatment using animal models by managing lab animal procedures and equipment maintenance.

Skills

Programming & Analysis:
• Matlab, Python, R, JavaScript
• Machine Learning
• Signal Processing and Neural Data Analysis (EMD, ICA)

Software & Tools:
• Audio and Speech Processing: Praat
• Neuroimaging: FreeSurfer, SPM12
• Experiment Design and Data Visualization

Languages:
• English • Mandarin • Japanese • German

Publications & Conference Presentations

Publications
• Hsu, C.-H.; Wu, Y.-N. (2021). *Application of Empirical Mode Decomposition for Decoding Perception of Faces Using Magnetoencephalography*. Sensors, 21(18), 6235.
• Hsu, C.-H.; Wu, Y.-N.; Lee, C.-Y. (2021). *Effects of Phonological Consistency and Semantic Radical Combinability on N170 and P200 in the Reading of Chinese Phonograms*. Frontiers in Psychology.

Conference Presentations
• Wu, Y., Chang, C., Hickok, G. (2024). *Exploring Cross-Categorical Pitch Shift Effects on Mandarin Tone Production*. Poster presentation at the Society for the Neurobiology of Language 2024 Annual Meeting.

• Chen, P.-H., Wu, Y.-N., Hsu, C.-H., and Lee, C. L. (2021). *Resolving Lexical Ambiguity Enhances Frontal Positivity: Data From Event-Related Potentials and Magnetoencephalogram*. Poster presented at the 28th Annual Meeting fo the Cognitive Neuroscience Society (March 13-16, Virtual conference).

• Wu, Y., Semenuks, A. (2020) That's (NOT) About the Size of It: Sound-Symbolic Effect on Size Perception. The Evolution of Language: Proceedings of the 13th International Converence (EvoLang13)

• Hsu, C., Wu, Y., Yen, T., (2020) MEG response of left temporal cortex to modifier-head compounds. Annual meeting of the Taiwan Society of Cognitive Neuroscience.