**Exploring Neural Encoding of Acoustic Dimensions in the Auditory Cortex through Intracranial EEG Recordings during Speech and Music Perception**

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Sounds possess multiple perceptual dimensions, including loudness, brightness, timbre, pitch, and more. Yet, it remains unclear whether these dimensions are widely distributed across the auditory cortex or if they are specifically encoded within distinct subregions. In this project, leveraging intracranial EEG recordings obtained from epileptic patients (implanted for clinical purposes) while they listened to speech and music, the candidate will ascertain the precise locations within the auditory cortex where multiple acoustic dimensions are encoded. Specifically, the candidate will determine if different dimensions spatially overlap or if they are distinctly encoded in particular areas of the auditory cortex. Additionally, the aim will be to identify which dimensions are encoded in a distributed manner and which ones are sparsely coded in specific subregions. This project holds the promise of advancing our comprehension of how fundamental acoustic dimensions are processed within the human auditory cortex.

*Skills required:* Enthusiasm; Be fairly resourceful in terms of code/programming (Python)