



FACULTY MENTOR

Vikash Gilja

PROJECT TITLE

Estimating Behaviorally Relevant Error from Neural Activity to Advance Speech Prosthesis Design

PROJECT DESCRIPTION

Current high-performance speech prostheses decode a text representation of intended speech. The rate and accuracy of these systems are far below that of typical human speech, and direct synthesis of speech acoustics remains challenging. Given the complexity of direct speech synthesis, advances will require continuous estimation of errors in synthesized speech. Unfortunately, common loss functions do not align well with perception and can only be calculated if the intended speech production is known. This project will explore task-relevant and irrelevant errors introduced during both perception and production of vowels to evaluate the neural correlates of the error to enable the development of self-correcting, neural activity-driven speech prostheses.

This project will be in person.

INTERNS NEEDED

1 Student

PREREQUISITES

- Signal processing, LPC analysis, filter bank-based analyses
- Experience with signal processing
- Experience with software development for real-time studies



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PROJECT TITLE

Computer Vision-Based Tracking of Songbirds During Vocal Behavior

PROJECT DESCRIPTION

We study songbirds to develop neural activity-driven speech prostheses. At present, we measure their vocal performance with microphones. However, body posture and movement are critical aspects of communication and can interact with vocal performance. Thus, we seek to track animal posture and movement over multi-hour recording sessions. These data will be integrated into our systems that estimate vocal performance from neural activity.

This project will be in person.

INTERNS NEEDED

1 Student

PREREQUISITES

- Experience with computer vision and/or image processing
- Python programming experience