

University of Houston - Biomedical Engineering Seminar

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Via Zoom: <https://uh-edu-cougarnet.zoom.us/j/93512038041>

Encoding of Reward and Physical Effort by sensorimotor cortical local field potentials



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Abstract

Reward expectation in humans and animals is known to modulate behavior and its valuation is discounted by the physical effort associated with the movement. Our previous work has shown reward encoding within the macaque premotor (PMd), motor (M1), and somatosensory (S1) cortices. However, the involvement of these regions in concurrent processing of reward and effort information is not clearly understood. To address this gap, we asked how the reward representation in local field potentials (LFPs), recorded from the PMd, M1, and S1 are influenced by physical effort requirements of the motor task. We trained a nonhuman primate to perform three variations of a planar center-out reaching task: reward-only, effort-only, and reward-effort tasks. Our results showed an inverse relationship between reward-value and LFP amplitude as well as subjective influence of effort information on the reward value encoded by the LFP amplitude.

Biosketch

Taruna Yadav is a PhD Candidate in Dr. Joseph Francis's lab in the Department of Biomedical Engineering at the University of Houston. She earned her Masters degree in Electrical Engineering from Indian Institute of Technology Gandhinagar and Bachelors degree in Electronics and Communication Engineering from IP university, India. Her doctoral research aims at understanding the role of sensorimotor local field potentials in processing context information such as reward and physical effort during a motor task. The results of this work will contribute towards development of autonomous brain-machine interfaces to restore motor functions in patients with paralysis and amputation.