UC San Diego
Cognitive Science

Wednesday 10/23/24
https://ucsd.zoom.us/j/91402106809
Public Engagement Building (PEB) 721
12:00 pm – 1:20 pm

The Cognitive Science Department

is pleased to announce the following seminar by

Dr. Eric Mooshagian

UCSD

"Two hands are better than one:
Understanding the role of the posterior parietal cortex
in coordinated eye and arm movements."

Abstract: *Understanding how the brain coordinates the movement of multiple body parts is fundamentally important to systems and cognitive neuroscience. However, the cortical representation of coordinated movements remains poorly understood. Research focusing on unimanual movements makes it difficult to study the neural circuits involved in coordination. Since our eyes often look to where we are about to reach, eye and arm movement patterns tend to be highly stereotyped. Yet, primates also use their arms in complex ways that frequently require bimanual coordination. Studying these interactions through bimanual movements provides a powerful approach. For example, when reaching for two objects, which one do you look at first? It is known that planning visually guided movements depends, in part, on the posterior parietal cortex (PPC). Within the PPC, spatial representations of saccade and reach goals preferentially activate cells in the lateral intraparietal area (LIP) and the parietal reach region (PRR), respectively. My research uses single-unit and local field potential recordings, and reversible inactivation during bimanual movements in primates, to study the roles of these regions in planning coordinated eye and arm movements.*

In this talk, I will first discuss how I use bimanual reaching to investigate eye-hand coordination. Then, I will describe the use of this approach to address the hypothesis that PPC plays a causal role in saccade selection during eye-arm coordination. Next, I will explain the coding of limb movements in PRR and how reach signals are integrated between the hemispheres to support bimanual coordination. Finally, I will discuss my current research aimed at understanding the decision-making process behind choosing to reach with the left or right arm, with the goal of gaining a mechanistic understanding of motor decision-making in the brain.

Bio: *Dr. Eric Mooshagian is a systems and cognitive neuroscientist whose research explores how spatial locations are represented in the cerebral cortex and guide eye and arm movements. More broadly, he studies the transformation of sensory information into motor commands, using methods such as behavioral experiments, extracellular recordings, temporary lesions, and brain imaging in human and animal models. Dr. Mooshagian earned his B.A., M.A., and Ph.D. in Cognitive Neuroscience from UCLA. He received postdoctoral training in brain stimulation at the National Institute of Neurological Disorders and Stroke (NINDS) and later in electrophysiology at Washington University School of Medicine. He is currently an Assistant Research Scientist and Lecturer at UC San Diego. His research is supported by NINDS.*