UCLA Engineering
HENRY SAMUELI SCHOOL OF ENGINEERING AND APPLIED SCIENCE

BIOENGINEERING

PRESENTS

" Re-thinking Paralysis: Establishment of new RE-HAB (REconnecting the Hand and Arm to the Brain) Clinical Trial"

THURSDAY, January 28th, 2021
12:00 – 1:00 PM
Zoom Link:
https://ucla.zoom.us/j/97216069429

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ABSTRACT:

Cortically controlled neuroprostheses have long been posited as the "holy grail" for intracortical brain-machine interfaces (BMIs). The efficacy of BMIs has advanced to the point where a small number of laboratories around the US are now involved in BMI trials involving human participants with chronic paralysis. As part of the Braingate2 Clinical Trial, and the newly established ReHAB Clinical Trial, we at Case Western Reserve University are investigating using BMIs to control Functional Electrical Stimulation (FES) systems for restoring functional arm movements to persons with chronic high cervical spinal cord injury. This lecture will highlight a number of our clinical, technological, and scientific advances towards developing a BMI controlled FES arm neuroprosthesis. Additionally, this lecture will discuss use of human BMI systems as a platform for answering fundamental questions of human sensorimotor control, including underlying mechanisms of motor performance and learning, and internal representations of kinetic, kinematic, and sensory parameters. Finally, this lecture will discuss the establishment and goals of the new RE-HAB clinical trial, and subsequent steps towards development of chronically implanted clinically viable BMI neuroprosthetic systems.

BIOGRAPHY:

A. Bolu Ajiboye, PhD is the Elmer Lincoln Lindseth Associate Professor of Biomedical Engineering at Case Western Reserve University. He also holds an appointment as a Biomedical Engineering Scientist at the Louis Stokes Cleveland VA Medical Center. He received his dual BS degree in Biomedical and Electrical Engineering, as well as a minor in Computer Science, from Duke University (Durham, NC) in 2000. He then received his Masters (2003) and Doctoral (2008) degrees from Northwestern University (Evanston, IL). Dr. Ajiboye is the director the Laboratory for Intelligent Machine-Brain Systems (LIMBS), where his main research interest is in the development and control of bi-directional brain-machine interface (BMI) neuroprosthetic technologies for restoring motor and sensory function to individuals who have experienced severely debilitating injuries to the nervous system, such as spinal cord injury and stroke. Currently, he is interested in understanding at a systems level the relationships between the firing patterns of multi-neuronal networks and the kinetic (muscle activity and force) and kinematic (limb position and velocity) outputs of these neural systems in the control of upper-limb movements, as well as encoding models of somatosensory percepts for sensory restoration. The end goal of his research is to develop BMI systems that allow for more natural interactions with one's surrounding environment, and more natural control of assistive technologies, such as artificial limbs and functional electrical stimulation (FES) based systems.

Additionally, his research focuses on understanding natural muscle coordination patterns involved in motor coordination, and how these patterns can be used in neuroprosthetic systems to restore lost or compromised function through FES.