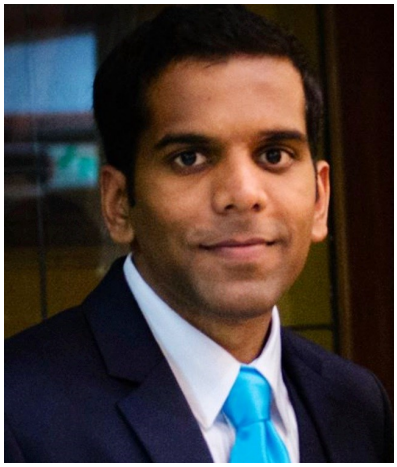
FIU Biomedical Engineering
FLORIDA INTERNATIONAL UNIVERSITY

Biomedical Engineering
Wallace H. Coulter Foundation
Lecture Series

WALLACE H. COULTER Foundation

LATERALIZATION OF MOTOR CONTROL MECHANISMS IN STROKE PATIENTS

Dr. Saandeep Mani
University of Maryland School of Medicine



Thursday, April 17th, 2014
LECTURE: 9:00 AM - 10:00 AM

ENGINEERING CENTER
ROOM EC 1114
10555 WEST FLAGLER STREET
MIAMI, FL 33174

Abstract:
Sensorimotor stroke is the leading cause of permanent disability in United States, often resulting in contralesional hemiparesis characterized by weakness, spasticity, and abnormal synergies in the side contralateral to the damaged hemisphere. While a great deal of research has focused on understanding the deficits in the contralateral limbs, very little attention has been given to the fact that the hemispheres are not functionally symmetric for sensorimotor processing. Sainburg et al have previously shown that each hemisphere contributes specific mechanisms to the control of both the arms: the left hemisphere for control of movement trajectory, and the right hemisphere for stabilizing the limb in a steady state position. We propose that each hemisphere imparts its specialized control processes to each arm. A clear prediction of this hypothesis is that damage to the right or left hemisphere due to stroke, should produce hemisphere specific deficits in both the ipsilesional and contralesional arms of stroke patients. Our results support our hypothesis that left and right hemisphere damage produces hemisphere specific deficits in motor control that affect motor adaptation in both the ipsilesional and contralesional arms of stroke patients. Our findings have significant implications for clinical rehabilitation.

Biography
Dr. Saandeep Mani is a Postdoctoral Researcher in the Neurorehabilitation field, specializing in upper extremity rehabilitation of stroke survivors. His doctoral and postdoctoral research work focused on identifying motor control mechanisms within each hemisphere and the distinct motor deficits that result from unilateral stroke. His research with Dr. Robert Sainburg provided the first evidence of hemisphere-specific contralesional motor deficits, and has been published in renowned Neuroscience journals including Brain and Neurorehabilitation and Neural Repair. His current and future interests are focused on identifying the neuronal regions that are specialized for such distinct control mechanisms using a combination of transcranial magnetic stimulation (TMS) and virtual reality environments. He is also interested in understanding the inter-hemispheric differences in neuroplasticity using TMS in stroke survivors.

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