BIOENGINEERING
Fall 2019 Seminar

Date: Thursday, September 12, 2019
Time: 12:00 pm - 1:00pm
Location: Exploratory Hall, Room L111
(Videoconferencing to SciTech, K. Johnson Hall Rm 254)

Sridevi V. Sarma, Ph.D.

Biography: Sridevi Sarma received the B.S. degree in electrical engineering from Cornell University, Ithaca NY, in 1994; and an M.S. and Ph.D. degrees in Electrical Engineering and Computer Science from Massachusetts Institute of Technology in, Cambridge MA, in 1997 and 2006, respectively. From 2000-2003 she took a leave of absence to start a data analytics company. From 2006--2009, she was a Postdoctoral Fellow in the Brain and Cognitive Sciences Department at the Massachusetts Institute of Technology, Cambridge. She is now an associate professor in the Institute for Computational Medicine, Department of Biomedical Engineering, at Johns Hopkins University, Baltimore MD. Her research interests include modeling, estimation and control of neural systems using electrical stimulation. She is a recipient of the GE faculty for the future scholarship, a National Science Foundation graduate research fellow, a L'Oreal For Women in Science fellow, the Burroughs Wellcome Fund Careers at the Scientific Interface Award, the Krishna Kumar New Investigator Award from the North American Neuromodulation Society, and a recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE) and the Whiting School of Engineering Robert B. Pond Excellence in Teaching Award.

Title: Risk-taking bias in human decision-making is encoded via a right-left brain push-pull system

Abstract: A person's decisions vary even when options stay the same, like when a gambler changes bets despite constant odds of winning. Internal bias (e.g., emotion) contributes to this variability and is shaped by past outcomes, yet its neurobiology during decision-making is not well understood. To map neural circuits encoding bias, we administered a gambling task to 10 participants implanted with intracerebral depth electrodes in cortical and subcortical structures. We predicted the variability in betting behavior within and across patients by individual bias, which is estimated through a dynamical model of choice. Our analysis further revealed that high-frequency activity increased in the right hemisphere when participants were biased towards risky bets, while it increased in the left hemisphere when participants were biased away from risky bets. Our findings provide the first electrophysiological evidence that risk taking bias is a lateralized push-pull neural system governing counterintuitive and highly variable decision-making in humans.