Abstract: Brain-computer interfaces (BCI) translate neural activity into movements of a computer cursor or robotic limb. BCIs are known for their ability to assist paralyzed patients. A lesser known, but increasingly important, use of BCIs is their ability to further our basic scientific understanding of brain function. In particular, BCIs are providing insights into the neural mechanisms underlying sensorimotor control that are currently difficult to obtain using limb movements. In this talk, I will demonstrate how a BCI can be leveraged to study how the brain learns. Specifically, I will address why learning some tasks is easier than others, as well as how populations of neurons change their activity in concert during learning.

About the speaker: Byron Yu received the B.S. degree in Electrical Engineering and Computer Sciences from the University of California, Berkeley in 2001. He received the M.S. and Ph.D. degrees in Electrical Engineering in 2003 and 2007, respectively, from Stanford University. From 2007 to 2009, he was a postdoctoral fellow jointly in Electrical Engineering and Neuroscience at Stanford University and at the Gatsby Computational Neuroscience Unit, University College London. He then joined the faculty of Carnegie Mellon University in 2010, where he is an Associate Professor in Electrical & Computer Engineering and Biomedical Engineering and the Gerard G. Elia Career Development Professor. He is broadly interested in how large populations of neurons process information, from encoding sensory stimuli to driving motor actions. His group develops and applies novel statistical algorithms and uses brain-computer interfaces to study brain function.