DEPARTMENT of INDUSTRIAL ENGINEERING
UNIVERSITY of HOUSTON

FRIDAY SEMINAR SERIES
BROADEN HORIZONS | EXTEND MINDS

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Date: Friday, Nov 10, 2017
Time: 1 - 1:50 pm
Location: D3 W122

Applications of NeuroErgonomics to Health and Safety Research

Abstract: Ergonomics has long since moved from being a science of improving work efficiency to now being focused on enhancing well-being while improving systems performance. The primary goal of ergonomics is to ensure that work demands are always lower than operator capacity, and the conventional assessment of physical work demands include measuring biomechanical and physiological outcomes, such as joint torque, muscle activity, and heart rate, in laboratory and field settings. To effectively understand how humans interact with work systems, it is not only important to ask how well they perform, but also *why* they perform a certain way. Neuroergonomics, the study of brain and behavior at work, can fill in the gaps on the neural bases of both physical and cognitive performance that were left unanswered with traditional ergonomic assessments. While neuroergonomic approaches in understanding cognitive functioning during work is gaining wide popularity, assessing neural correlates of physical work capacity has received little attention. Like any new field, physical neuroergonomics research first needs to understand the capabilities, limitations, and considerations of existing neuroimaging techniques on simulated work environments that can help build the knowledge base necessary to perform research in naturalistic work environments. In this light, neuroimaging techniques applicable to neuroergonomics that has expanded our understanding of the neural correlates of operators' physical capabilities and limitations when they interact with work systems will be discussed. Specifically, application of functional near infrared spectroscopy (fNIRS) to measure cortical activity associated with neuromuscular function will be covered.

Biography: Ranjana Mehta, PhD, is Assistant Professor in the Department of Environmental and Occu-pational Health at the Texas A&M University and graduate faculty in the Texas A&M Insti-tute for Neuroscience, director of the NeuroErgonomics Laboratory, and co-director of the Texas A&M Ergonomics Center. She received her Ph.D. in Industrial & Systems Engineering from Virginia Tech. Research in the NeuroErgonomics Lab focus on brain-behavior relation-ships in three synergetic initiatives: 1) impact of psychological risk factors, such as stress, on neuromuscular function, 2) influence of the changing workforce characteristics, such as ag-ing and obesity, on workplace injuries, and 3) applying brain-behavior models to address mobility limitations in clinical populations.