EPSTEIN INSTITUTE SEMINAR ▪ ISE 651

Improving Human-System Interaction via Wearable Physiological Monitoring

ABSTRACT – Advances in wearable sensor technology can be leveraged to assess and predict human physiological states during human interaction with systems. Sensor data recorded from the brain and/or other parts of the human body, including the eyes and heart, enable understanding of the mechanisms underlying perceptual, cognitive, and motor functioning in operational environments. This presentation considers two recent studies. The first study investigated the effect of recurrent task-induced acute stress on task performance, vagally mediated heart variability measures, and task-evoked pupillary response. The second study employed minimum spanning tree analysis, an unbiased graph theory approach, to quantify changes in brain network organization during the performance of a load-varying working memory task. These studies demonstrate the utility of physiological monitoring in the design, development, and assessment of cyber-physical systems to enhance productivity, safety, and health.

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SPEAKER BIO – Dr. Joseph Nuamah is currently an Assistant Professor at the School of Industrial Engineering and Management, and Director of the Neuroergonomics and Cognitive Engineering Laboratory at Oklahoma State University. His research interests center around understanding neural, physiological, and behavioral mechanisms underlying human-system interactions. Dr. Nuamah's work has appeared in several journals including Brain-Computer Interfaces, Human Factors, IEEE Transactions on Human-Machine Systems, and Frontiers in Human Neuroscience. His research is funded by the NSF.

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TUESDAY, AUGUST 29, 2023
3:30 PM – 4:50 PM
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