

*Holcombe Department of Electrical and Computer Engineering
Seminar Series*

Application of Wearable Sensors for Monitoring Daily Activities

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Abstract

With technological advancements, the usage of wearable technologies for the monitoring of activities of daily living has become increasingly popularized. Objective and accurate measurements of human actions in their natural environment are helpful for both healthy people and patients to evaluate their needs for wellbeing, the scope of assistance from the health provider, safety and the efficacy of ongoing treatment, etc. The focus of my research was to facilitate the monitoring of daily activities by introducing low power, lightweight but intelligent wearable sensors, and developing concerning pattern recognition models from the sensor signals. These tasks feature a combination of applied physics, embedded systems, biomedical signal processing, computational intelligence, health sciences and technologies, etc. This research talk will address these interdisciplinary fields with a brief summary of the major accomplishments of my doctoral research, including:

- Development of low power multi-sensory wearable sensor systems to objectively monitor the habit of cigarette smoking in free-living.
- Application of computational intelligence to extract critical information on the behavioral and the physiological manifestation of cigarette smoking.
- Development of wearable technologies to monitor the food intake behavior of a person.
- Development of an infant feeding bottle to monitor the milk-intake of an infant and quantitatively assess the nutritive sucking patterns of preterm infants.
- Development of a multi-sensory exoskeleton to capture information of human gait to support later development of robotic lower-limb prostheses.
- Application of computational intelligence to extract information on individual walking and recognize obstacles from eccentric videos.

Biography of Speaker

Masudul Imtiaz is currently a Post-Doctoral Fellow at the Department of Electrical and Computer Engineering at the University of Alabama, Tuscaloosa, AL, USA. In summer 2019, he received his Ph.D. degree from the University of Alabama majoring at Electrical Engineering. Previously, Masudul received the bachelor's and master's degree in Applied Physics, Electronics and Communication Engineering from the University of Dhaka, Bangladesh in 2010 and 2011, respectively. His research interests include the development of wearable systems, biomedical signal processing, pattern recognition, machine learning and deep learning algorithms for preventive, diagnostic, and assistive health technology with a special focus on physical activity and cigarette smoking monitoring.