

BHI Technical and Educational Lecture Series

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Lecture schedule

From Wearable Sensors to Behavioral Informatics: Frontiers in Digital Health

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Abstract: The emergence of wearable sensor technology paves the way for objective, sensor-driven assessment of health-related behaviors, which in modern society act as the major determining factors of life expectancy and quality of life. The modern sensor technology carries the promise to objectively measure and quantify complex human behaviors such as physical activity, food intake patterns, addictions, sleeping patterns, and social interactions. Furthermore, real-time recognition of the behavior enables novel approaches for just-in-time behavior modification. The recognition, characterization and interpretation of behaviors from sensor data presents a challenging problem due to complexity and variability of real-life behaviors as well as the indirect manner in which events of interest are inferred from behavioral and physiological manifestations registered by the sensors. The talk will provide an overview of our work on wearable sensors for monitoring of food intake in adults and infants, monitoring of cigarette smoking and smoke exposure, as well as monitoring of physical activity and energy expenditure. Special attention will be paid to the sensor solutions for monitoring of food intake, which are of particular interest for understanding and treatment of related medical conditions, such as obesity and eating disorders.

Biosketch: Edward Sazonov (IEEE M'02, SM'11) received the Diploma of Systems Engineer from Khabarovsk State University of Technology, Russia, in 1993 and the Ph.D. degree in Computer Engineering from West Virginia University, Morgantown, WV, in 2002. Currently he is a James R. Cudworth endowed Professor in the Department of Electrical and Computer Engineering at the University of Alabama, Tuscaloosa, AL and the head of the Computer Laboratory of Ambient and Wearable Systems (<http://claws.eng.ua.edu>). His research interests span wearable devices, sensor-based behavioral informatics and methods of biomedical signal processing and pattern recognition. Devices developed in his laboratory include a wearable sensor for objective detection and characterization of food intake (AIM – Automatic Ingestion Monitor); a highly accurate physical activity and gait monitor integrated into a shoe insole (SmartStep, winner of Bluetooth Innovation WorldCup 2009); a wearable sensor system for monitoring of cigarette smoking (PACT); and others. The research in his lab was recognized by several awards, including best paper awards, President's research award at the University of Alabama and others. In 2020 Dr. Sazonov served as a Fulbright Distinguished Chair at the University of Newcastle, Australia. His research has been supported by the National Institutes of Health, National Science Foundation, National Academies of Science, as well as by state agencies, private industry and foundations. Dr. Sazonov serves as a Specialty Chief Editor for Wearable Electronics, Frontiers In Electronics and Associate Editor for several IEEE journals.

Talk Recording:

<https://pitt.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=deea670c-0e1f-4546-8523-adc0012e30aa>