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The Institute for Sensing and Embedded Network Systems Engineering

Proudly Presents

Non-invasive Sleep Quality Monitoring

Sleep occupies nearly a third of human's life and acts as a critical daily function, helping our body to balance and regulate vital systems. However, in the United States, more than 35% of the population is sleep deprived. Therefore, quantifying sleep quality is important and has significant clinical value in detecting and diagnosing various sleep-related disorders. Unfortunately, the current "gold standard" for studying patients' sleep is obtrusive, expensive, and often inaccurate.

In this talk, I will introduce our wearable and radio-based sensing systems that promise unobtrusive, low-cost, and accurate sleep study for in-hospital and in-home settings. I will start with a sensing system that is able to unobtrusively monitor breathing volume and detect sleep disorder breathing in patients using radio signals from afar. I will then discuss an in-ear wearable sensing system that can simultaneously monitor human's brain activities, eye movement, and facial movement, which are critical for fine-grained sleep stage monitoring. I will also identify other potential uses of these systems in a broader context of health care, such as monitoring eating habits and disorders, improving neurological surgery practice, and detecting seizure. I will conclude the talk by discussing my on-going research as well as my future directions to improve current health care practices through the development of other innovative cyber-physical healthcare systems.

Speaker

Tam Vu is the director of Mobile and Networked Systems Lab at University of Colorado Denver, where he and his team work on building systems to improve pediatric health care practices. Specifically, he designs and implements novel and practical cyber-physical systems to make physiological sensing (e.g. breathing volume measurement, brainwave signal monitoring, muscle movement recording, and sleep quality monitoring) less obtrusive at lower cost. His research outcomes are published in highly selective venues such as ACM MobiCom, ACM MobiSys, ACM SenSys, ACM CCS, IEEE Infocom, ACM UbiComp, Transaction on Mobile Computing (TMC).

Tam Vu's research contribution has been recognized with a Google Faculty Research Award in 2014; four (04) best paper awards from world-leading conferences including SenSys 2016, MobiCom S3 2016, MobiCom 2012, and MobiCom 2011; a Creative Research Collaborative Fellowship at University of Colorado Denver in 2015; and wide press coverage including Denver Post, CNN TV, NY Times, The Wall Street Journal, National Public Radio (NPR), MIT Technology Review, Yahoo News. He received his Ph.D. in Computer Science from WINLAB, Rutgers University in 2013 and B.S. from Hanoi University of Technology in 2006.

Tam Vu
University of Colorado Denver

February 9, 2017
11:00 a.m. – 12:00 p.m.
FAU Engineering East
777 Glades Rd, EE 405
Boca Raton, FL

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