

Research of Smart Technology for Eldercare

by

Professor Dominic K. C. Ho

**Department of Electrical and Computer Engineering
University of Missouri
USA**



Date: 30 August 2018 (Thursday)

Time: 11:00 a.m. – 12:00 noon

Venue: SHIAE Conference Room

7/F, William M.W. Mong Engineering Building, CUHK

Abstract

The use of technologies for health care and assisted living has attracted considerable interest in recent years. Perhaps an urgent need for this technology development is for elderly care, due to the aging population in the world and the considerable amount of financial burden incurred. A number of commercial products are available for health monitoring. Nevertheless, the wearable nature of these devices presents challenges and discomfort to the elderly. This talk introduces two low-cost, non-invasive and non-wearable sensors together with the sensor data processing for eldercare that are suitable for use in an in-home environment. One is the radar that is effective for gait monitoring and fall detection. The other is the bed sensor that is capable of heart rate tracking and relative blood pressure monitoring. The radar is mounted on the ceiling/wall and is based on the Doppler shift effect that characterizes the fall motion in terms of micro-Doppler. The bed sensor is placed under the mattress and is based on the hydraulic principle that captures the mechanical movement of the heart in terms of the Ballistocardiogram. Time-frequency analysis together with machine learning approach are used for sensor data processing. In addition to laboratory results, performance of the developed eldercare technologies in senior residence apartments will be demonstrated.

Biography of the Speaker

Dr. Dominic K. C. Ho received the B.Sc. degree in Electronics and the Ph.D. degree in Electronic Engineering from the Chinese University of Hong Kong. He was a research associate in the Royal Military College of Canada, a member of Scientific Staff at the Bell-Northern Research, Montreal, Canada, and a faculty at the University of Saskatchewan, Saskatoon, Canada. He is currently a Professor in the Electrical Engineering and Computer Science Department of the University of Missouri. His research interests are in sensor array processing, source localization, wireless communications and adaptive processing.

Dr. Ho is a Fellow of the IEEE. He was a Technical Chair of the IEEE International Conference on Acoustics, Speech and Signal Processing 2016 (ICASSP2016). Dr. Ho served as the Vice-Chair (2011-2012), Chair (2013-2014) and Past Chair (2015) of the Sensor Array and Multichannel (SAM) Technical Committee of the IEEE Signal Processing Society. He was an Associate Editor of the IEEE Transactions on Signal Processing (2003-2006, 2009-2013) and the IEEE Signal Processing Letters (2004-2008). He is an inventor of 22 patents in the United States, Canada, Europe and Asia on geolocation and signal processing for wireless communications.