The School of Electrical and Computer Engineering
DISTINGUISHED SEMINAR SERIES
2019

The Distinguished Seminar Series of the School of Electrical and Computer Engineering (ECE) presents the work of internationally recognized researchers. This seminar series is intended to provide an open platform for the faculty & students to have a dialog with leading researchers in various fields of ECE, and to build a dynamic and vibrant culture of research and academic exchange in the ECE department. All seminars are free and open to the public.

A Self-powered IoT SoC Platform for Wearable Health Care
2:00 - 3:00 p.m. Tuesday, November 19 | ATRC 102

Abstract: This talk will focus on an IoT Systems-on-Chip (SoCs) as part of research work which targets applications in self-powered chip sets for use in public health, ambient intelligence, safety and security and IoT. One such application, which we will discuss in detail, is a groundbreaking self-powered IoT SoC platform for wearable health care. More specifically, we will present a novel, fully integrated ECG signal processing system for the prediction of ventricular arrhythmia using a unique set of ECG features extracted from two consecutive cardiac cycles. Two databases of the heart signal recordings from the American Heart Association (AHA) and the MIT PhysioNet were used as training, test and validation sets to evaluate the performance of the proposed system. The system achieved an accuracy of 99%.The ECG signal is sensed using a flexible, dry, Graphene-based technology and the system is powered up by harvesting human thermal energy. The system architecture is implemented in Global foundries' 65 nm CMOS process, occupies 0.112 mm2 and consumes 2.78 micro Watt at an operating frequency of 10 KHz and from a supply voltage of 1.2V. To our knowledge, this is the first SoC implementation of an ECG-based processor that is capable of predicting ventricular arrhythmia hours before the onset and with an accuracy of 99%.

Dr. Mohammed Ismail

Professor and Chair of ECE
Wayne State University
Detroit, Michigan

Fellow IEEE, Adjunct professor with KUSTAR, Abu Dhabi, UAE

Speaker Bio: Dr. Mohammed Ismail, a prolific author and entrepreneur in the field of chip design/test and nanotechnology, spent over 25 years in academia and industry in the U.S. and Europe. He obtained his B.S. and M.S. from Cairo University, Egypt and His Ph.D. from the University of Manitoba, Canada in 1983, all in electrical engineering. He is the founder of the Ohio State University's (OSU) Analog VLSI Lab, one of the foremost research entities in the field of nano-electronics, analog, mixed signal and RF integrated circuits and served as its director. He Joined KUSTAR, the UAE in 2011, where he holds the ATIC (now Mubadala Technology) Professor Chair and is Founding Chair of the ECE Department. He joined Wayne State University in Detroit, Michigan as professor and Chair of ECE while maintaining his position at KUSTAR as an Adjunct. He is the founding editor of the Springer Journal of Analog Integrated Circuits and Signal Processing and serves as the journal's Editor-in-Chief. He received the U.S. Presidential Young Investigator Award from the White House. More recently he received the 2018 UNESCO Medal for Contributions to NanoScience and the SRC Board of Directors Special Recognition for Leadership in Semiconductor Research in the UAE. He is a Fellow of IEEE.

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Refreshments and drinks will be offered after the seminar.

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