Webinar on Healthcare IoT
The Fourth Edition

IEEE Communication Society
eHealth Technical Committee: Special Interest Group on "IoT for eHealth"
and
Technical Committee Green Computing and Communications: Special Interest Group on "Pandemics

Prof. **Bhavani Thuraisingham**
Fellow of ACM, IEEE, AAAS, NAI, IMA
Founders Chair Professor
Department of Computer Science
The University of Texas at Dallas
Richardson,USA

Title: Integrating Cyber Security and Machine Learning with Applications in Internet of Transportation Systems

Abstract: TBA

Prof. **David Kotz**
Fellow of ACM, IEEE
Department of Computer Science
Dartmouth College
Hanover, USA

Title: Auracle: Detecting Eating Episodes with an Ear-Mounted Sensor

Abstract: We propose Auracle, a wearable earpiece that can automatically recognize eating behavior. More specifically, in free-living conditions, we can recognize when and for how long a person is eating. Using an off-the-shelf contact microphone placed behind the ear, Auracle captures the sound of a person chewing as it passes through the bone and tissue of the head. This audio data is then processed by a custom analog/digital circuit board. To ensure reliable (yet comfortable) contact between microphone and skin, all hardware components are incorporated into a 3D-printed behind-the-head framework. We collected field data with 14 participants for 32 hours in free-living conditions and additional eating data with 10 participants for 2 hours in a laboratory setting. We achieved accuracy exceeding 92.8% and F1 score exceeding 77.5% for eating detection. Moreover, Auracle successfully detected 20-24 eating episodes (depending on the metrics) out of 26 in free-living conditions. We demonstrate that our custom device could sense, process, and classify audio data in real time. Additionally, we estimate Auracle can last 28.1 hours with a 110 mAh battery while communicating its observations of eating behavior to a smartphone over Bluetooth.

Prof. **Cecilia Mascolo**
Professor of Mobile Systems
Fellow of Jesus College
Department of Computer Science and Technology
University of Cambridge, UK

Title: Sounding out wearable and audio data for health diagnostics

Abstract: Sensing and data analysis has made strides to improve how we understand human behaviour and health. I will reflect on the challenges that mobile and wearable health systems are introducing for the developers as well as the users. I will use examples from my group's research on exploring machine learning and data analysis for health application in collaboration with clinicians. I will discuss our project on using audio signals for disease diagnostics and our work in the context of COVID-19: a crowdsourced collected through mobile apps (covid-19-sounds.org) of respiratory sounds to pre-screen and diagnose COVID-19.

Principal Host: **Prof. Sudip Misra, IIT Kharagpur, India**
Co-Host: **Dr. Arijit Roy, University of Luxembourg, Luxembourg**
Co-Host: **Dr. Ayan Mondal, IIT Indore, India**

More details can be found **here**
Date: **January 14, 2022**
Time: **8:30 PM – 10:00 PM, Indian Time (IST)**

All participants need to pre-register by January 13, 2022 by filling-up the following form: **Registration Link**
Zoom sign-in details will be shared with the registered participants using the email address provided in the registration form.