

**Date:** 23rd January, 2024 (Tuesday)

**Time:** 3.30 pm to 4.30 pm

**Venue:** RM 101, Rajeev Motwani Building (Ground Floor), Department of Computer Science and Engineering, IIT Kanpur

**Title:** A Look into the Future: Circuits and Systems for a Distributed Network of Wearables and Implants utilizing Human Tissue Conductivity

**Speaker:**

Baibhab Chatterjee, PhD

Assistant Professor,

Department of Electrical and Computer Engineering

University of Florida

<https://chatterjee.ece.ufl.edu/>

**Abstract:**

Wireless communication using electro-magnetic (EM) fields acts as the backbone for information exchange among wearable devices around the human body. However, traditional EM techniques (for example - Bluetooth, Wi-Fi, ZigBee) result in a large amount of power consumption, limiting the battery life of such devices. On the other hand, for Implanted sensor nodes, EM fields incur high amount of absorption in the tissue. To mitigate the challenges of wireless communication around the body with ultra low-power, this talk will focus on our recent works on data communication through the human body – using the conductive properties of the human tissue – for both wearables and implants. This technology can have deep societal and scientific impact in the fields of brain-machine interfaces, electroceuticals, connected healthcare as well as AR/VR.

**Speaker-Bio:**

Baibhab Chatterjee is an Assistant Professor in the Department of Electrical and Computer Engineering (ECE) at the University of Florida, and directs the Wireless Intelligent Sensor Electronics (WISE) Lab. He received his Ph.D. from the Elmore Family School of Electrical Engineering, Purdue University, West Lafayette, IN, USA in 2022. His industry experience includes two years as a Digital Design Engineer/Senior Digital Design Engineer with Intel, India, and one year as a Research and Development Engineer with Tejas Networks, India. He was a Quantum Hardware Design Intern with IBM T.J. Watson Research Center, NY, USA during 2020-2021, where he worked on ultra-low power quantum controller/receiver front-ends. Baibhab's works received multiple best paper/presentation awards in solid state circuits and security conferences including CICC, RFIC and HOST. His research interests include low-power analog, RF, and mixed-signal circuit design for next-generation biomedical applications.