

Georgia Tech WISH Center x NSF SUSMED Joint Workshop

Innovations in Sustainable Devices for Healthcare: Wearables and Digital Technologies

Date: 9:00 am – 1:15 pm, March 03, 2025

Location: Marcus Nanotechnology Conference Room, 345 Ferst Drive, Atlanta, GA 30332

Who want to attend: Undergrad/graduate students, WISH Center faculty, NSF SUSMED faculty, SUSMED trainees, VIP students, and other researchers

Theme: This collaborative workshop is being organized by the Wearable Intelligent Systems and Healthcare (WISH) Center in conjunction with the NSF Sustainable Development of Smart Medical Devices (SUSMED) Program at Georgia Tech. The primary goal of this event is to unite researchers and engineers to exchange insights on the latest advancements in wearable technology, digital innovations, and integrated systems. Discussions will focus on these technological developments to address the challenges and opportunities presented by wearable and intelligent systems. Together, we aim to cultivate new collaborative opportunities within the Georgia Tech community, as well as with external researchers and industry partners.

Agenda:

Time	Contents	Speaker
09:00 ~ 09:15	Director Welcome, Introducing WISH Center and NRT SUSMED program	Dr. Eric Vogel, Dr. Hong Yeo, Dr. Yuhang Hu, WISH Center PM SUSMED PM
09:15 ~ 10:00	Keynote I Devices and technologies for quantifying human health	Prof. Omer Inan
10:00 ~ 10:30	WISH Center Rapid Talk (5 WISH students, 5 mins per student)	WISH Center researchers
10:30 ~ 11:00	Poster session I & Coffee/Snack Break	
11:00 ~ 11:45	Keynote II The Present and Future of Sustainable Smart Medical Devices	Prof. Josiah Hester
11:45 ~ 12:15	SUSMED Program Rapid Talk (5 SUSMED students, 5 mins per student)	NSF SUSMED Trainees
12:15 ~ 01:15	Closing Poster session II, Lunch, and Award ceremony	

Keynote I: Devices and Technologies for Quantifying Human Health



Omer T. Inan, PhD

Regents Entrepreneur, Linda J. and Mark C. Smith Chaired Professor of
Electrical and Computer Engineering
Adjunct Professor of Biomedical Engineering,
Program Faculty Bioengineering

Abstract:

Recent advances in digital health technologies are enabling biomedical researchers to reframe health optimization and disease treatment in a patient-specific, personalized manner. This talk will focus on my group's research in two areas of relevance to digital health: (1) cardiogenic vibration sensing and analytics; and (2) musculoskeletal sensing with joint acoustic emissions and bioimpedance. Our group has extensively studied the timings and characteristics of cardiogenic vibration signals such as the ballistocardiogram and seismocardiogram, and applied these signals for quantifying filling pressures and volume status in the context of heart failure (volume overload) and hemorrhage (volume depletion). We have also leveraged miniature contact microphones to measure the sounds emitted by joints, such as the knees, during movement, and have examined how these acoustic characteristics are altered by musculoskeletal injuries and disorders (e.g., arthritis). We envision that these technologies can all contribute to improving patient care with lower cost and better outcomes.

Keynote II: The Present and Future of Sustainable Smart Medical Devices



Josiah Hester, PhD

Associate Professor of Interactive Computing and Computer Science
College of Computing
Director, Center for Advancing Responsible Computing
Associate Director, Community Engaged Research
Brook Bvers Institute for Sustainable Systems (BBISS)

Abstract:

The last decade have seen a dramatic shift in the capability of implantable cell based therapies– that can mediate sleep, fight cancer, and beat diabetes. Concurrently, advances in wearables, biosensors, and behavioral sensing now allow us to build a very personal and nuanced understanding of a person. Finally, advancements in the systems, hardware and algorithmic foundations of machine learning and artificial intelligence are empowering health decision making in the small, on a budget, and for more critical, complex, and personal conditions. In this talk we will explore these advancements in more detail, delve into some of the optimistic futures of this inflection point we find our selves in– and outline the many challenges and potential for harm we will face from integrating AI, biosensors, and biologics.