Department of Engineering Science and Mechanics
Department of Biomedical Engineering

Research Seminar

Dr. Zheng Yan
University of Missouri-Columbia

"Fundamental Materials, Devices, and Manufacturing Innovations of Soft Bioelectronics for Customized Applications in Human Healthcare and Human-Machine Interface"

Abstract

Emerging soft electronics can eliminate the mismatch between soft biological tissues and rigid conventional devices and exhibit many potential applications. We have a broad interest in soft bioelectronics, from materials, devices and manufacturing innovations to their applications in human healthcare and human-machine interface. Our current research is driven by three primary long-term goals. The first goal is to achieve simple, cost-effective fabrications of skin-interfaced soft bioelectronics with customized multimodalities to satisfy various arising needs of home-based, personalized healthcare. Regarding this thrust, I will present our recent research of pencil-drawing and laser-scribing of bioelectronic devices on papers and elastomers. One representative example is a laser-scribed multimodal wearable biomedical device that can simultaneously record uric acid, vitamin C and caffeine in sweat, alcohol in breath, heart rate variation, and slow alpha area for personalized precision nutrition management. The second goal is to create new electronic materials that can blur biotic-abiotic dissimilarities in structures, mechanics, and biochemistry to improve the chronical biocompatibility of enabling bioelectronics. For this theme, I will introduce our recent efforts of developing bioinspired porous electronic materials and anisotropic electronic materials for bioelectronics with underrepresented properties. The third goal is to enable high-performance three-dimensional (3D) electronics, which can seamlessly integrate with engineered biological tissues (e.g., organoids), for drug testing and fundamental pathological studies. For this topic, I will talk about our recent results of mechanically guided, deterministic 3D assembly and its application in tissue-integrated, 3D bioelectronic scaffolds.

Biography

Dr. Zheng Yan is an assistant professor in the Department of Biomedical, Biological & Chemical Engineering and Department of Mechanical & Aerospace Engineering at the University of Missouri-Columbia. He received his Ph.D. from Rice University (2009-2013) and did postdoc training at the University of Illinois at Urbana-Champaign (2013-2017) before joining the faculty of the University of Missouri. His current research focuses on fundamental materials, devices, and manufacturing innovations of soft electronics for health and robotics. Dr. Yan is a recipient of the NSF CAREER Award and the UM System President's Award for Early Career Excellence. .

Tuesday, May 11, 2021
12:00 p.m. – 1:00 p.m.
Register in advance for this meeting:

https://psu.zoom.us/meeting/register/tJUkdO-vrT0uHd30L-ig8bDXED4tgVP1iNZ-
After registering, you will receive a confirmation email containing information about joining the meeting.

For additional details call Diane K. Bierly 814-863-6491