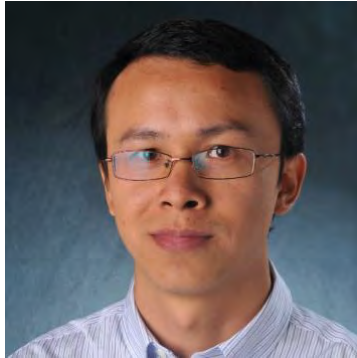


University of Houston - Biomedical Engineering Seminar

Friday, February 24, 2023, 12 noon, Rm 105 SEC

Multifunctional wearable electronics with superior stretching, self-healing, recycling and reconfiguring capabilities



Jianliang Xiao, Ph.D.

Abstract

Wearable electronics can be integrated with the human body for monitoring physical activities and health conditions, for human-computer interfaces, and for virtual/augmented reality. We here report a multifunctional wearable electronic system that combines advances in materials, chemistry and mechanics to enable superior stretchability, self-healability, recyclability and reconfigurability. This electronic system heterogeneously integrates rigid, soft and liquid materials through a low-cost and scalable fabrication method. Multifunctional wearable electronic devices that can sense electrocardiograph (ECG), temperature, motion, strain and acoustic signals are demonstrated. A high-performance wearable thermoelectric generator (TEG) that can convert otherwise wasted body heat into electric power will also be discussed. The properties reported in these wearable electronic systems provide an approach to address sustainability and environment issues associated with mass production and use of electronics.

Biosketch

Jianliang Xiao is an Associate Professor in Mechanical Engineering at University of Colorado Boulder, and previously a Postdoc in Materials Science and Engineering at the University of Illinois. His Ph.D. is in M.E. from Northwestern, and M.S. and B.S. degrees in Engineering Mechanics from Tsinghua University. His research interests include stretchable/flexible electronics, and mechanics of soft materials, thin films and nanomaterials. He has received awards from ACM, and Theoretical & Applied Mechanics Letters, ACS PRF Doctoral New Investigator award, and ASME Haythornthwaite Research Initiation Award. He is an Associate Editor of Frontiers in Sensors, Newsletter Editor of ASME Applied Mechanics Division, and Editorial Board member of NPJ Flexible Electronics, Science China Technological Sciences, Micromachines, Frontiers in Electronics, and Frontiers in Bioengineering and Biotechnology.