

Devices for Healthcare

Session Co-chairs: Ramin Haghgoie, General Fluidics Corp., Qingming Luo, Huazhong University of Science and Technology

Advancement in devices for healthcare takes place at the intersection of almost every field of engineering. From biocompatible materials to wireless communication to fluid dynamics to biological engineering, contributions from a diverse set of fields are required. Today, advances in materials, communication, and computation have been combined with advances in assay techniques, microfluidics, and manufacturing to bring new classes of medical devices to market and to create a pipeline of exciting technologies for the future. These devices are making broad impact for patients in areas like global health, individualized disease treatment, and everyday health and well-being to name a few. In particular, exciting areas at the frontier of devices for healthcare include wearable diagnostic devices, mobile medicine, and biomedical imaging. This session will cover these exciting areas to give an overview of how emerging diagnostic devices and techniques are improving our interaction with the healthcare system from the individual level to the societal.

Our first speaker, Roozbeh Ghaffari, will discuss new materials that enable wearable conformal diagnostic devices enabling real-time continuous monitoring of individual patients. The discussion around wearable diagnostic devices will include the importance of material properties, biocompatibility, and advanced manufacturing methods. Our second speaker, David Erickson, will present advances in technologies allowing mobile diagnosis and treatment of disease. Discussion on this topic will include the importance of new techniques for global health applications. Our third speaker, Jun Zhou, will expand the discussion of wearable and mobile diagnostic devices to include power requirements and sources for these devices. In this topic, innovations in energy harvesting and power generation will be discussed as promising ways to power the distributed diagnostic devices of the future. Finally, our fourth speaker, Ling Fu, will introduce us to the latest biomedical imaging techniques and technologies. This talk will include discussion of the challenges and advances in automated image acquisition and processing.