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Bringing Photoacoustic Tomography to Patients: From High-Resolution Whole-Body Imaging to Wearable Solutions

Lei S. Li
Assistant Professor of Electrical and Computer Engineering and Bioengineering
Rice University

Extended Abstract

This talk will cover the recent development of photoacoustic imaging technology, including a benchtop imager, termed single-impulse panoramic photoacoustic computed tomography (SIP-PACT), and its preclinical applications. SIP-PACT has also been scaled up for breast cancer diagnosis with improved sensitivity and specificity. SIP-PACT has also revealed various molecular contrasts and demonstrated wide-range biomedical applications, including tracking circulating tumor cells, imaging photoswitchable proteins, and guiding microrobots for drug delivery. In addition, to shape the benchtop PACT systems toward portable and wearable devices with low cost without compromising the imaging performance, we have recently developed photoacoustic topography through an ergodic relay, a high-throughput imaging system with significantly reduced system size, complexity, and cost, enabling wearable applications. As a rapidly evolving imaging technique, photoacoustic imaging promises preclinical applications and clinical translation.