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Miniature Mobile Imaging and Sensing Devices

Guest Editor:

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Message from the Guest Editor

Imaging and sensing tools are indispensable for scientific discovery and innovation. The field is undergoing a profound transformation. The price and size of image sensors, light sources, and optical components have been significantly reduced. The revolution in smartphones and other consumer digital devices have placed low-cost, high-quality imaging systems in the hands of billions of people. Device fabrication and prototyping is becoming increasingly inexpensive and faster than ever with 3D printing. With these trends, various cost-effective, field-portable, and easy-to-use imaging and sensing tools are emerging. Advanced microscopy and spectroscopy measurements can now be rapidly performed on palm-size/wearable devices. Using such miniature devices, personal health can be monitored in real time and continuous fashion via consumer-level health measurement and diagnostic platforms, especially useful in the developing world where diagnostic technologies are both limited and expensive. This SI seeks to showcase recent development of mobile imaging and sensing technologies and their applications. It aims to form a collection of articles that focus on novel methodological developments of miniaturized microscopes, mobile phone-based devices, lab-on-a-chip microscopes, handheld/wearable sensors, and utilization of such systems for a variety of promising detection and sensing applications.