

Flexible and Rapidly Fabricated Smart Microfluidic Devices

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Abstract

In-line with the Industry Revolution 4.0, Microfluidics has grown substantially to realize real-life, fully robust and automated platforms. With unique properties amenable to be used in a variety of areas, from energy to biomedical, microfluidics has evolved and become contemporary by incorporating various other new methods and processes. To realize next generation of microfluidic devices, it is important to develop user-friendly, turnkey, portable and inexpensive solutions. This include the development of flexible and rapily protptypes devices, integratable detection method and data processing/analysis. In this presentation, the development of various cleanroom-free methods to fabricate benchtop laser-written and 3D pritned microfluidic devices, with optimum fluidics and detection zones, will be presented. Further, to make such devices smart, new approaches, such as off-the-shelf microcontrollers and microprocessors, Internet-of-Things and Machine Learning are being leveraged. This presentation will cover the recent development and ongoing work to realize such self-powered microfluidic devices including various bio/chemical, diagnostic devices and biofuel cells.

Biography

Sanket Goel did his BSc (H) from Delhi University; MSc from IIT Delhi; PhD from University of Alberta in 1998, 2000, and 2006 respectively. Sanket did his postdoc at Stanford University (2006-2008), was a PI with ASTAR, Singapore (2008- 20011), and headed the R&D department at the University of Petroleum & Energy Studies (2011-2015). His lab focusses on developing intelligent sensors and smart energy harvesters for various applications. He has >200

publications and 14 patents, has delivered >80 invited talks and guided/guiding 27 PhD students. He has won several awards, including Dr. C R Mitra best faculty award (2021) and Fulbright fellowship (2015). He is an Associate Editor of IEEE Transactions on NanoBioscience, IEEE Sensors Journal, IEEE Access and Applied Nanoscience. He is also a Visiting Associate Professor with UiT, The Arctic University of Norway.