Large Area Flexible Electronic Skin

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The miniaturization led advances in microelectronics over 50 years have revolutionized our lives through fast computing and communication. Recent advances in the field are propelled by applications such as robotics, wearable systems, and healthcare etc. through More than Moore technologies. Often these applications require electronics to conform to 3D surfaces and this calls for new methods to realize devices and circuits on unconventional substrates such as plastics and paper. This lecture will present various approaches (over different time and dimension scales) for obtaining distributed electronics and sensing components on flexible and conformable substrates, especially in context with tactile or electronic skin (e-skin). These approaches range from distributed off-the-shelf electronics, integrated on flexible printed circuit boards to advanced alternatives such as e-skin by printed nanowires, graphene and ultra-thin chips, etc. The technology for such sensitive flexible (and possibly stretchable) electronic systems is also the key enabler for numerous emerging fields such as internet of things, smart cities and mobile health etc. This lecture will also discuss how the flexible electronics research may unfold in the future.

Bio-Sketch

Ravinder Dahiya is Professor of Electronics and Nanoengineering and Engineering and Physical Sciences Research Council (EPSRC) Fellow in the School of Engineering at University of Glasgow. He is the Director of Electronic Systems Design Centre (ESDC) and the leader of Bendable Electronics and Sensing Technologies (BEST) group. His group conducts fundamental research on high-mobility materials based flexible electronics and electronic skin, and their application in robotics, prosthetics and wearable systems.

Prof. Dahiya has published more than 200 research articles, 4 books (3 at various publication stages), and 11 patents (including 7 submitted). He has given more than 90 invited/plenary talks. He has led many international projects including those funded by European Commission, EPSRC, The Royal Society, The Royal Academy of Engineering, and The Scottish Funding Council.

He is Distinguished Lecturer of IEEE Sensors Council and is on the Editorial Boards of Scientific Reports (Nature Group), IEEE Transactions on Robotics and IEEE Sensors Journal. He was the Technical Program Co-Chair (TPC) for IEEE Sensors Conference in 2017 and in continuing in this role for the IEEE Sensors Conference in 2018.

Prof. Dahiya holds EPSRC Fellowship and in past he received Marie Curie Fellowship and Japanese Monbusho Fellowship. He has received several awards and most recent among them are: 2016 IEEE Sensor Council Technical Achievement Award, the 2016 Microelectronic Engineering Young Investigator Award (Elsevier). In 2016, he was included in list of Scottish 40UNDER40.

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TEDx talk: 'Animating the Inanimate World' (https://www.youtube.com/watch?v=h7yY7ExYAB4)