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Sensing Human Pulse-Rate Using Ionic Polymer Metal Composite (IPMC)

Debabrata Chatterjee

Indian Institute of Engineering Science and Technology, India

Development of smart material using ionic polymer-metal composites (IPMCs) is a demanding area of research [1-2]. The IPMCs are now recognized to have potential applications in developing bio-mimetic sensors, actuators, transducers, and artificial muscles. The IPMCs offer several advantages such as bio-compatibility, low power consumption and miniaturization. We have been engaged in developing IPMC based actuators and sensors [3,4]. Recently we have reported results of the actuation and sensing studies of a five-fingered miniaturized robotic hand fabricated by using IPMC [4]. Very recently, we have explored the possibility of using Nafion based IPMC for sensing the rhythm of human pulse and hear rate. In this talk the concept of a novel pulse rate sensing device is introduced exhibiting the proof-of-principle of the mechano-electrical functions of the device, namely IPMC film prepared by surface platinization of the ionic-polymer film.

Biography:

Dr. Debabrata Chatterjee is former Head of the Chemistry and Biomimetics Group of CSIR-Central Mechanical Engineering Research Institute at Durgapur, India. He is now engaged as Research Advisor in the Vice-Chancellor's Group at the University of Burdwan, Burdwan, India. His present research interests lie in the development of bio-inspired devices using electro-active polymers. He is an elected fellow of National Academy of Science, India (FNASc) and Fellow of the Royal Society. of Chemistry, UK (FRSC). Childhood polio has left him physically challenged with a considerable mobility problem.