Center for Human-Centric Interfaces & Engineering Guest Lecture

March 23, 2021 | 9:00AM EDT

Electronic Skins for Medical & Sports Applications

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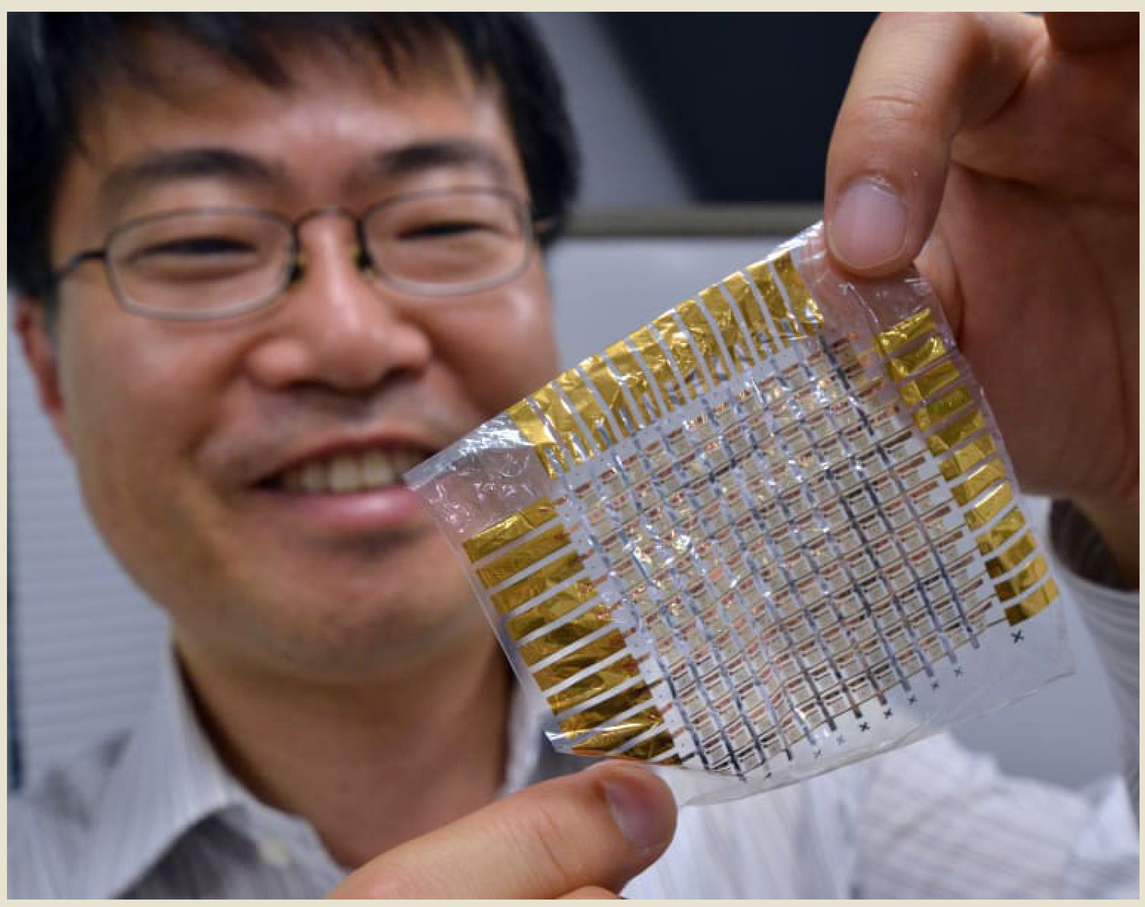
Access the Lecture at: https://tinyurl.com/CHICEsomeya

Abstract: The human skin is a large-area, multi-point, multi-modal, stretchable sensor, which has inspired the development of an electronic skin for robots to simultaneously detect pressure and thermal distributions. By improving its conformability, the application of electronic skin has expanded from robots to the human body such that an ultrathin semiconductor membrane can be directly laminated onto the skin. Such intimate and conformal integration of electronics with the human skin, namely, smart skin, allows for the continuous monitoring of health conditions. The ultimate goal of the smart skin is to non-invasively measure human activities under natural conditions, which would enable electronic skins and the human skin to interactively reinforce each other. In this talk, I will review recent progress of stretchable thin-film electronics for applications to medical, healthcare, sports, fitness, and well-being of humans. I will also address issues and the future prospect of smart skins.

Bio: Takao Someya received his Ph.D. degree in electrical engineering from the University of Tokyo in 1997. Since 2009, he has been a professor of Department of Electrical and Electronic Engineering, The University of Tokyo. From 2001 to 2002, he worked at the Nanocenter (NSEC) of Columbia University and Bell Labs, Lucent Technologies, as a Visiting Scholar. His current research focus is on stretchable and flexibleorganicelectronicsfortheapplicationstohealthcare, biomedical and robotics. He conducted NEDO/JAPERA Project as Project Leader (2011-2019) and currently leading JST/ACCEL Super-bioimager Project as Research Director (2017-2022). Prof. Someya received The 16th Leo Esaki Prize and the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology in 2019. He was appointed a global scholar of Princeton University (2009-2017), MRS board of directors (2009-2011), and National University of Singapore (NUS) GlobalFoundaries Visiting Professor (2016-2019). His current appointments are: The Technical University of Munich (TUM) Hans Fischer Senior Fellow (2017-), Director of The Japan Society of Applied Physics (2018-), Associate Editor of Science Advances, and IEEE Spectrum Editorial Advisory Board Member.

His current research interests include organic transistors, flexible electronics, plastic integrated circuits, large-area sensors, and plastic actuators.



This may look like a chocolate wrapper, but the incredibly sophisticated e-skin has flexible integrated circuits and a touch sensor system, which can be used as wearable healthcare sensors. Pictured, Someya with his e-skin. Credit: YOSHIKAZU TSUNO/AFP/AFP/Getty Images

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