

Standalone Stretchable Device Platform for Biomedicine

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Abstract

Conventional electronics today form on the planar surfaces of brittle wafer substrates and are not compatible with 3D deformable surfaces. As a result, stretchable electronic devices have been developed for continuous health monitoring. Practical applications of the next-generation stretchable electronics hinge on the integration of stretchable sustained power supplies with highly sensitive on-skin sensors and wireless transmission modules. This talk presents the challenges, design strategies, and novel fabrication processes behind a potential standalone stretchable device platform that (a) integrates with 3D curvilinear dynamically changing surfaces, and (b) dissolves completely after its effective operation. The resulting device platform creates application opportunities in fundamental biomedical research, disease diagnostic confirmation, healthy aging, human-machine interface, and smart Internet of Things

Biography

Prof. Huanyu "Larry" Cheng is the James L. Henderson, Jr. Memorial Associate Professor of Engineering Science and Mechanics at Penn State University. His research group focuses on the design, fabrication, and application of the standalone stretchable device platform. Larry has co-authored more than 180 publications with total citations >25,000 according to Google Scholar. His work has been recognized through the reception of numerous awards, including Highly Cited Researcher in the field of Cross-Field since 2023, Advanced Materials Rising Stars, International Journal of Extreme Manufacturing (IJEM) Best Editor Award since 2022, Humboldt Research Fellowship for Experienced Researchers, 2021 National Institutes of Health (NIH) Trailblazer Award, MIT Technology Review Innovators Under 35 (TR35 China) in 2021, Forbes 30 Under 30 in 2017, among others. He also serves as the editor for Chemical Engineering Journal, Computers in Biology and Medicine, along with a reviewer for > 300 journals.