Docket #: S18-197

Strain-sensitive, stretchable, and self-healable semiconducting film for multiplexed skin-like sensor array

Stanford researchers have developed strain-sensitive, stretchable, and self-healable semiconducting film. The researchers have created a multiplexed sensory transistor array using this material which can detect strain distribution by surface deformation. Strain-sensitive and stretchable semiconductors can function as both sensors and the active material of a transistor, integrating sensing functionality and readout devices for simplified fabrication processes and more robust and conformable devices.

The field of skin-inspired electronic materials is challenging because devices need to be sensitive to stimuli as well as stretchable. A major obstacle in the development of electronic skin has been its vulnerability to damage and the self-healing ability of this invention is a major step forward for this technology. Electronic skin can support the development of smart skin devices, soft robots, and biomedical devices. This strain-sensitive, stretchable, and self-healable semiconducting film has the potential to change the paraign of electronic skin and expand its applications.

Stage of Development

- Proof of concept

Related Technologies:
Stanford docket 17-234: Development of damage-resistant stretchable electronic materials and devices for multifunctional wearable electronics

Stanford docket 18-200: Fully self-healable and stretchable organic transistor for skin-inspired electronics

Applications

- Electronic skins
- Smart prosthetics
- Stretchable electronic circuits
- Self-healable electronic devices
- Soft robots

Advantages

- Self-healing and tough
- Absorbs mechanical strain
- Simplifies manufacturing process

Publications

- Jin Young Oh, et al. "Stretchable self-healable semiconducting polymer film for active-matrix strain-sensing array,"Science Advances (2019), doi:10.1126/sciadv.aav3097

Patents

- Published Application: 20190372005
- Issued: 11,532,789 (USA)

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