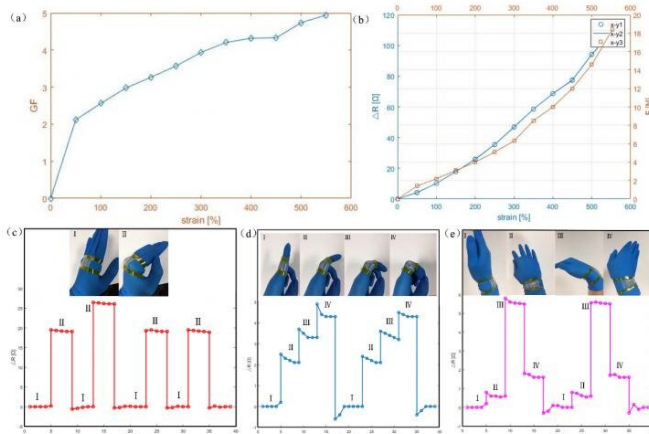


Scientists improve sensitivity and stretchability of room-temperature liquid metal-based sensor

17 April 2019



a) The relationship between GF and strain. (b) The relationship of resistance change and strain. Photographs of this sensors attached on the joint (c)/fingers (d)/wrists (e) of different motions, and corresponding resistance change. Credit: WANG Lei

Scientists have developed a room-temperature, liquid metal-based, super-stretchable sensor with the advantages of easy fabrication, low cost, high repeatability and a gauge factor as great as 4.95. The new device potentially takes liquid metal-based sensors to the next stage. The findings were published in *Scientific Reports*.

The research was conducted by a team led by Prof. Wang Lei at the Shenzhen Institutes of Advanced Technology (SIAT) of the Chinese Academy of Sciences.

Flexible strain sensors have become a key research area in the development of intelligent devices, and especially in wearable medical and robotic applications. Such sensors have broad prospects in human-computer interaction systems and electronic skin and human motion behavior

monitoring systems.

The important performance parameters for strain [sensors](#) include stretchability, sensitivity, stability, reliability and comfort. In order to achieve the best performance, Prof. Wang and his colleagues proposed optimizing the microchannel structures by finite element analysis (FEA). They then designed and fabricated the sensor accordingly.

Experimental results revealed that the sensor could be stretched to 550 percent of its original length, twisted 270 degrees, and bent 180 degrees. GF reached as high as 4.95 when strain reached 550 percent and the repeatability error rate was less than 0.1 percent.

The researchers used the sensor to conduct precision detection of joint, finger and wrist motion, achieving excellent [performance](#). Their results showed the great potential for application of the sensor to flexible wearable electronic devices.

More information: Qinwu Gao et al, Microchannel Structural Design For a Room-Temperature Liquid Metal Based Super-stretchable Sensor, *Scientific Reports* (2019). [DOI: 10.1038/s41598-019-42457-7](https://doi.org/10.1038/s41598-019-42457-7)

Provided by Chinese Academy of Sciences

APA citation: Scientists improve sensitivity and stretchability of room-temperature liquid metal-based sensor (2019, April 17) retrieved 23 September 2021 from <https://phys.org/news/2019-04-scientists-sensitivity-stretchability-room-temperature-liquid.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.