



Highly Stretchable & Flexible Electronic Sensors

Tech ID: 27609 / UC Case 2017-470-0

BRIEF DESCRIPTION

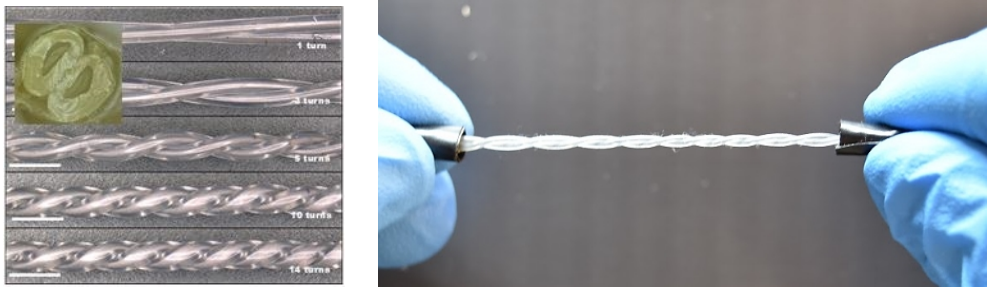
A new approach to creating highly stretchable electronic devices using twisted conductive microtubules.

BACKGROUND

There is growing interest in stretchable and flexible electronic sensors and devices. Unlike conventional electronic devices, which are often rigid and bulky, stretchable electronics are well suited to being applied to the human body. They are also amenable to being integrated in curved or deformable mechanical systems. Despite increased interest and developments in highly stretchable and flexible sensors and devices, many challenges remain. There is a need for efficient fabrication methods and for design techniques that lead to durable devices whose performance can be tuned to meet application requirements. Few solutions exist that are able to meet such needs.

DESCRIPTION

Researchers at the University of California, Santa Barbara have discovered a new approach to creating highly stretchable electronic devices using twisted conductive microtubules. The devices are suited for use as stretchable electronic interconnects, and, in other applications, may be employed as sensitive sensors for strain, contact force, rotation, and tactile sensing. They offer very high levels of stretchability (>400% strain), are highly flexible, durable, and reliable. Through the use of a twisted helical structure, the electronic and mechanical performance of the devices can be tuned to meet application requirements. Their simple design makes it easy to attach them to the human body or to a mechanism or tool using standard fixtures or adhesives. The sensors are compact, multifunctional and can easily integrate into various applications such as robotics, soft electronics, healthcare, and many more.



ADVANTAGES

- ▶ Highly stretchable electronic interconnects
- ▶ Simple fabrication approach will result in very low production costs
- ▶ Small, compact, and multifunctional
- ▶ Low modulus with high stretchability and durability

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Sensors, microtubules,

stetchable sensors, tactile

sensing, indansens

CATEGORIZED AS

- ▶ **Environment**
- ▶ Sensing
- ▶ **Engineering**
- ▶ Other

RELATED CASES

2017-470-0

- ▶ Control of mechanical performance & electronic sensitivity

APPLICATIONS

- ▶ Robotics (industrial, military)
- ▶ Soft Electronics/Electronics (stretchable electronic wires, haptic feedback, tactile sensing, actuators)
- ▶ Healthcare (surgical/medical devices, rehabilitation)
- ▶ Wearables/Human motion and force sensing (smart clothing, fitness tracker, health monitoring)

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,908,038	02/02/2021	2017-470

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Photonic Devices For Converting Light Energy Into Mechanical Energy, Forces, and Displacements
- ▶ Integrated Soft Optoelectronics for Wearable Health Monitoring

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