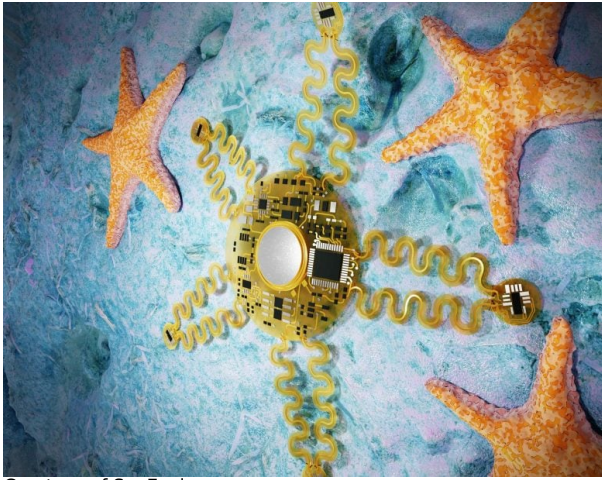


Track Your Heart Rate On The Go With this Starfish-designed Wearable

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Courtesy of SynEvol
Credit: Zheng Yang

Monitoring heart activity becomes challenging when we are in motion, a frequent drawback of numerous existing wearable gadgets. However, scientists at the University of Missouri have drawn inspiration from an unexpected origin: the starfish.

Investigating the method by which starfish right themselves by synchronizing their five arms, researchers Sicheng Chen and Zheng Yan from Mizzou's College of Engineering created a wearable gadget that replicates this mechanism. Their starfish-shaped device can monitor heart health in real-time, even while in motion.

Unlike conventional wearables such as smartwatches that depend on a single contact point, this device features five flexible arms that establish multiple contact points with the skin around the heart. This design enhances stability, enabling the collection of clearer, more dependable heart data during the wearer's activity.

The gadget links with a smartphone application, providing users immediate health information and assisting in the early detection of possible heart problems.

"Like a starfish, our device features five arms, with each one containing sensors that concurrently record both electrical and mechanical activity of the heart," said Chen, a postdoctoral fellow and lead author. "Most existing devices concentrate on recording just one signal or need different devices to monitor several signals simultaneously." This enables us to present a fuller view of an individual's heart health.

The team created a system powered by artificial intelligence that learned from a vast array of heart data, comprising signals from healthy individuals as well as those with heart disease. By employing intelligent technology, the system eliminates disruptions linked to movement and assesses heart signals to identify whether a person's heart is healthy or exhibiting warning signs. The results are displayed on the mobile application.

This AI-driven method accurately detects heart issues over 90% of the time. Due to the device's Bluetooth functionality, physicians can analyze the data from afar, offering a practical solution for home monitoring between appointments.

"This advantage also surpasses that of conventional clinical heart examinations like the Doppler ultrasound, which typically necessitates patients to remain still for precise outcomes," Chen stated.

The group is also enhancing the long-term durability of these devices.

"A significant issue with wearable devices is that they may lead to skin irritation if kept on for extended durations," stated Yan, an associate professor at Mizzou's College of Engineering.

In response to this, Yan's team is focused on enhancing the device's comfort and skin compatibility. Currently, the device adheres to the skin with a unique gel, but upcoming models will utilize a breathable, skin-friendly fabric for enhanced comfort. Yan's team has been enhancing this material over the last few years.

The device, inspired by starfish, can wirelessly charge while being worn, allowing for uninterrupted use without the need to take it off for charging.

In its early stages of development, the starfish-inspired innovation combines nature, engineering, and AI in a manner that could transform the management of heart health — simplifying and enhancing the reliability of heart activity tracking for individuals anytime, anywhere.