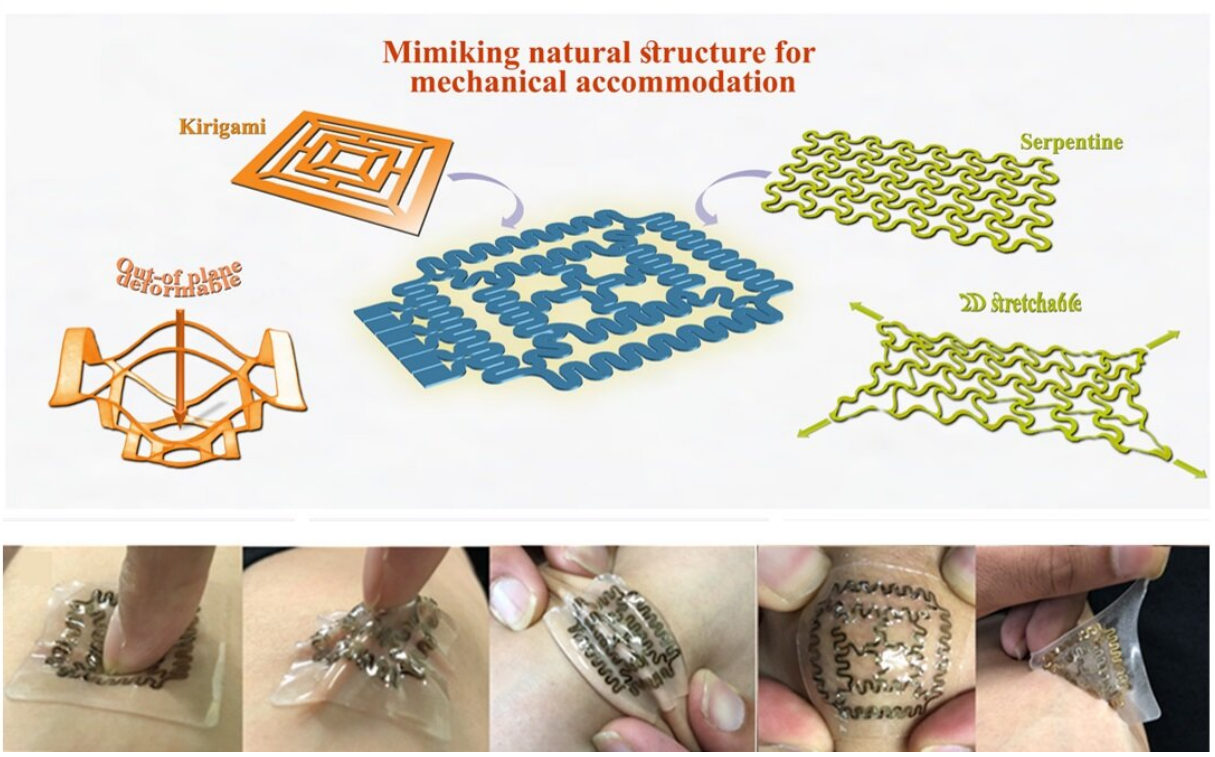
# A sensor to detect human body conditions in real-time

January 8 2020




A smart wearable real-time diagnosis sensor applying complex nature-mimicking structure. Credit: DGIST

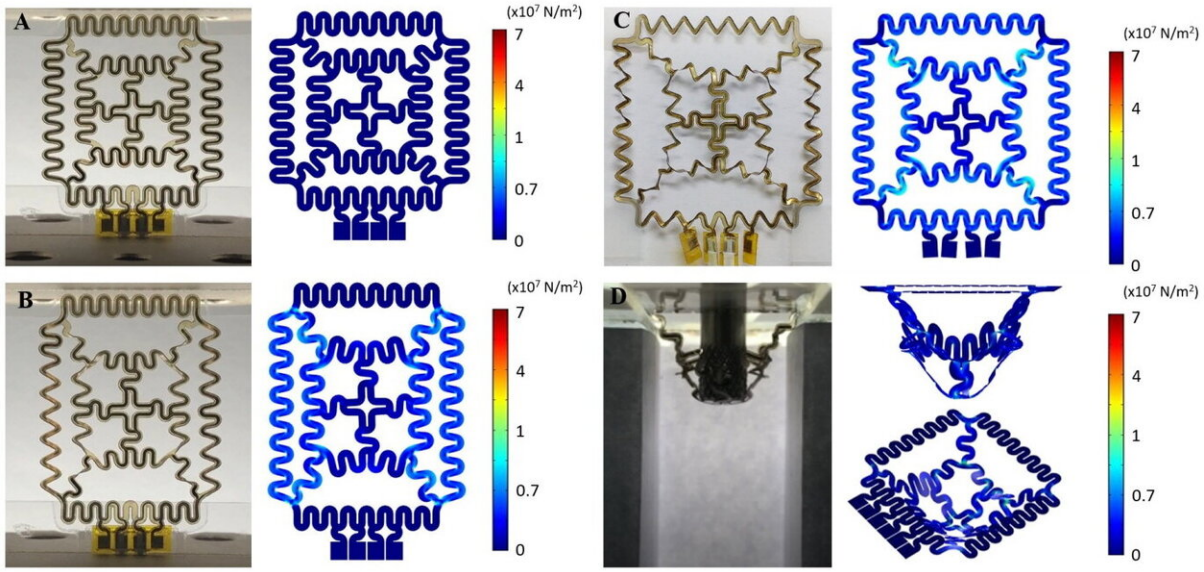
DGIST announced that Professor Hyuk-Jun Kwon in the Department of Information and Communication Engineering developed a 'patch-based health diagnosis sensor system' that is easily attached to skin in association with Professor Sunkook Kim's research team at

Sungkyunkwan University. This sensor is attached to skin as if attaching a band-aid and collects various health information in real-time by monitoring biosignals and certain movements, leading to expectations for diverse applications.

Research on wearable healthcare devices has been actively conducted with the well-being era in mind. However, product developments have faced many difficulties due to barriers in collecting biometric information such as body movements, sweat, and secretions. Professor Kwon's team focused on developing sensors that can collect stable biometric data from various situations including intense workouts and emergencies.

As a result, the research team has successfully developed precise structures for daily life using lasers, and increased the stability of a sensor that collects biometric information. Inspired by the crooked movements of snakes and spider webs, Professor Kwon's team created a stable structure for sensors to operate without damage despite extreme body movements. Moreover, the team greatly improved the vertical elasticity of the sensors by applying a zigzag paper craft structure, so that sensors can better endure intense body movements.

The patch-based sensor developed here was made of a biometric-friendly waterproof material, thus improving the difficulties in acquiring accurate information due to the skin-attachment problem. In addition, the sensor can also be connected to a smartphone using Bluetooth, so biometric data can be saved to a cloud server 24/7. This will enable a timely response to various emergencies such as infants, young children, and elders living alone who are in need care, as well as soldiers and firefighters who are constantly exposed to dangerous environments.




Stability in the skin environment of sensor platform applying complex nature-mimicking structure. Credit: DGIST

Professor Kwon said, "The key for this sensor development was securing structural stability and skin adhesion that can endure very intensive physical movements. The sensor is very useful because as long as it is attached to skin like a band-aid, it can collect various biodata information. It is expected to be applied to observe and monitor animal and livestock diseases as well in the future."

This research was published on the online version of *IEEE Transaction on Industrial Electronics*, a world-renowned international journal in electrical and electronic engineering.

**More information:** Sungho Lee et al, All-day Mobile Healthcare Monitoring System Based on Heterogeneous Stretchable Sensors for Medical Emergency, *IEEE Transactions on Industrial Electronics* (2019). DOI: 10.1109/TIE.2019.2950842

Provided by DGIST (Daegu Gyeongbuk Institute of Science and Technology)