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JNCASR develops new system for wearable devices that can detect stress

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A stretchable device that responds to strain much like the human body reacts to pain

Using silver wire network on a stretchable material, scientists from Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru, have developed a device that senses strain, mimics pain perception and adapts its electrical response accordingly. By recreating these pain-like responses, the device paves the way for future smart wearable systems that can help doctors detect stress.

When the material is stretched, small gaps appear within the silver network, temporarily breaking the electrical pathway. An electric pulse can then prompt the silver to fill these gaps, reconnecting the network and essentially "remembering" the event. Each time it is stretched and reconnected, the device gradually adjusts its response, much like how our bodies adapt to repeated pain over time. This dynamic process enables the device to mimic memory and adaptation, bringing humans closer to materials that respond intelligently to their environment.

The device sets itself apart by combining sensing and adaptive response in a single, flexible unit and offers a streamlined, efficient way for technology to adapt to its environment naturally, without complex setups or external sensors.

The research could lead to more advanced health monitoring systems that "feel" stress like the human body and adapt in real-time, giving feedback to doctors or users. Such technology could also improve robotic systems, helping machines become safer and more intuitive to work with humans.