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IIT-D designs scalable wearable pressure sensor to analyse gait patterns and postural deformities

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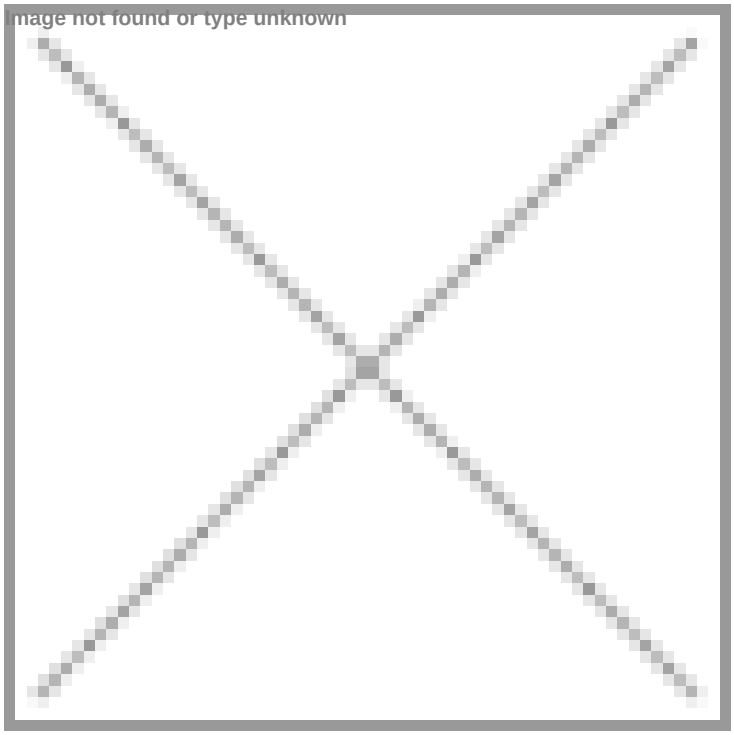
Sensor can potentially provide an easy, low-cost alternative to expensive footwear modifications



Gait and postural deformities are incapacitating and common in the present world. Studies indicate that the most prominent deformities include splay foot, flat foot, unstable hind foot with protruding heels, high arches, and irregular gait.

Researchers have been working extensively on postural deformity detection and their efficient corrections. The flexible wearable sensors adhere to the irregularities as mentioned above, wherein the application of specific pressure patterns has a one-to-one association with the type of abnormality.

Researchers at the Indian Institute of Technology Delhi (IIT-D) have developed one such scalable wearable pressure sensor based on a nanocomposite material, that has unique combination of light-sensitive polymer and piezoelectric nanoparticles, which offers the advantage of easy array design for pixelated sensing over large area, simple process flow, and low-cost implementation for human movement monitoring and injury rehabilitation.

The researchers in their study found the reported sensor as fully flexible that can be implemented as a sensor array considering a robust design that comfortably fits inside the insole of varying sizes.

It can also be easily attached at the palm or any body part where localised pressure sensing can be useful. The use of dual

transduction nanocomposite material in the proposed sensor allows concurrent sensing of mechanical strain as well as contact force/pressure that helps in easy integration with current machine learning algorithms by providing higher feature elements.

With its application diversity, the developed sensor opens up new horizons for in-house smart devices that overcome the pertinent challenges in the current state-of-the-art sensor technologies. The scope of market penetration of the proposed sensor is immense, and its technological footprint can envelope agriculture, healthcare, the energy sector, industries, sports, etc.