Bioinspired Triboelectric Wearable Stereognosis Sensor

Bioinspired triboelectric wearable (BEWARE) enables stereognosis with single-sensor proprioception and touch recognition for robotics and AR.

Researchers at Purdue University have developed wearable stereognosis sensor to emulate human stereognosis. Emulating stereognosis with wearable devices would enable unprecedented accuracy, precision, and safety in robotics, mixed realities, and human-machine teaming. Existing demonstrations lack practical stereognosis capabilities and require complex sensor arrays with increased manufacture and computational complexity.

Purdue researchers have developed a bioinspired triboelectric wearable stereognosis sensor (BEWARE) which emulates human stereognosis for combined proprioception and touch sense with frugally engineered textile-integrated triboelectric sensory units. BEWARE captures subtle mechanical events while holding objects. Triboelectrification converts mechanical events into electrical outputs. BEWARE's high-level of precision recognition surpasses reported levels of wearable sensors and demonstrates potential to recognize unknown objects.

Technology Validation: Triboelectric sensing of the surface properties enables the determination of material. Proprioceptive information decoding shape recognition was analyzed through t-distributed stochastic neighbor embedding algorithm.

Advantages:

-Sensitivity

-Cost effectiveness

-Accuracy and precision

-Wearable stereognosis enabled by a single sensor

Applications:

Technology ID
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Category
Chemicals & Advanced Materials/Polymer Science & Smart Materials
Digital Health & Medtech/Wearable Health Tech & Biosensors
Digital Health & Medtech/Assistive Robotics & Accessibility Systems

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View online

-Robotics

-Mixed realities

-Human-machine teaming

-Healthcare

-Advanced Manufacturing

-Societally pervasive fields

TRL: 6

Intellectual Property: