Wearable Strain Sensing Textiles
for Human Motion Monitoring
用於人體運動監測的可穿戴紗線傳感器

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Special features 技術特點

▶ *Good weavability for the integration into textiles*
紗線傳感器是可紡織的

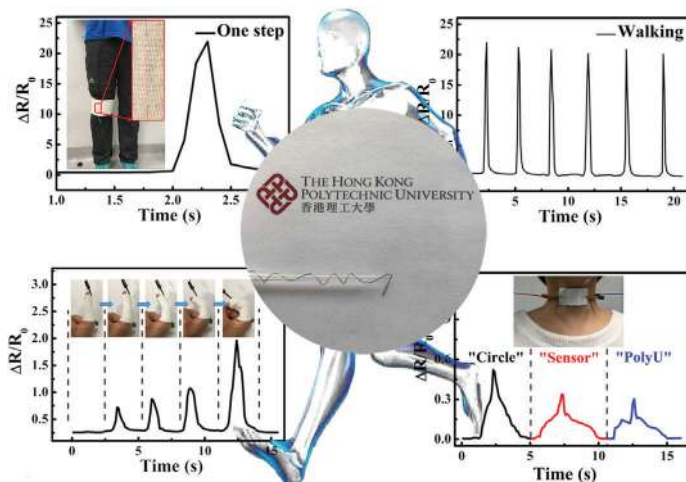▶ *Good flexibility for 3D strain/pressure mapping and large measuring area*
適用於三維和大面積測量

There is a rapidly growing demand for flexible and wearable strain sensors to monitor human motions and physiological conditions. However, most reported sensors for wearable electronics are usually fabricated in two-dimensional strip configurations, which cannot be properly integrated into textile structures and thus greatly degrade intrinsic properties and aesthetic feeling of clothing.

A new one-dimensional weavable strain sensing yarn with unique multilayer structure has been designed and fabricated through an easily manipulated protocol. The strain sensor not only exhibits excellent sensing performance but also possesses good weavability. Consequently, such yarn sensor has been directly integrated into various textile structures by using existing textile technologies for fabricating sensing textiles. The sensing textiles demonstrate their strong capability for real-time monitoring of human motions.

Some potential application areas for this technology include research on human biomechanics for health care and clinic medicine, outdoor activity for healthy and fitness, athletic training, functional clothing for the measurement of strain/pressure distribution and garment design and garment fitting evaluation.

用於人體運動和生理監測的可穿戴傳感器的需求不斷增長。然而，現有的柔性傳感器通常採用二維平面條帶結構製造，無法有效融入到紡織結構中，從而影響了服裝的使用和觀感。理大團隊研發了一種新型紗線傳感器，並用現有的紡織技術，將其引入織物製成可穿戴織物傳感器。高性能的紗線傳感器是可紡織的，使穿戴功能服裝時可感舒適。 另外，技術適用於三維和大面積測量，既低成本又易於生產，適用於健康和醫學研究、戶外活動、運動訓練及服裝設計。

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