

# Clever clothes: Seams in clothing capture body movement

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SeamSleeve is a novel sensing mechanism that uses powered seams as sensing channels, retaining traditional fabric design benefits for comfortable and robust motion capture. (a) we empirically evaluate and compare different designs to determine the optimal placement of seams and sensing channels; (b) we demonstrate that our approach can effectively train and classify arm movements; (c) we propose SeamSleeve for rehabilitation exercises beyond the clinic. Credit: Olivia Ruston

Everyday clothing may soon be able to capture and record body movements according to new research published by the Universities of Bristol and Bath.

Harmless low voltages are passed through conductive threads which are stitched into [garment](#) seams to create [electrical circuits](#). Their resistance changes with the movement of the wearer's body. The work opens up new possibilities to make digital clothing which senses and captures

movements much more accurately than is possible using current phones and smart watches.

The paper, presented at the [Designing Interactive Systems \(DIS\) conference](#) in Copenhagen on 3 July, lays the foundations for e-textile designers and clothing manufacturers to create cutting edge garments that could enhance exercise, physiotherapy and rehabilitation.

Professor Mike Fraser of the University of Bristol's School of Computer Science said, "We're excited by the opportunity for clothing manufacturers to implement our designs in sleeves and other garment seams.

"We've shown that common overlapped seams in standard garment constructions can do a good job of sensing movement. The design avoids the need for a separate power source by pairing the seam with a charging coil, drawing the energy wirelessly from a mobile phone placed in the pocket.

"This means advanced motion sensing garments could be made without altering existing manufacturing processes.

"We have also shown that [smartphone apps](#) using advanced Artificial Intelligence (AI) techniques can use this movement data to match [body movement](#) to specific postures or gestures such as physiotherapeutic exercises."

**More information:** 'SeamSleeve: Robust Arm Movement Sensing through Powered Stitching' by Olivia Ruston, Adwait Sharma and Mike Fraser in the Proceedings of the Conference on Designing Interactive Systems 2024, Copenhagen, Denmark.

Provided by University of Bristol

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