



# Stitched Stretch Sensor (20130122, Dr. Lucy Dunne)

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## Stretch Sensor

This textile-based stretchable sensor has been developed that is wearable and comfortable yet still allows for accurate measurements. A major obstacle facing researchers using sensors on clothing is integrating the electronic components and sensors into fabric so that it can be worn comfortably. The stretch sensor has the benefit of not needing to be oriented or aligned with the warp/fill direction of the textile. It can be attached anywhere on the garment. This method of fabricating stretch sensors uses current industrial apparel machinery, eliminating costs of new equipment or changing existing machines.

## Comfortable, Wearable Sensor for Smart Clothing

The stretchable sensor technology uses a serpentine stitch pattern with conductive yarn to create a wearable sensor that increases its electrical response when stretched. This design enables comfortable, garment-like sensors for tracking physiological changes, especially useful for patients with chronic conditions like heart failure where swelling may indicate cardiac complications. It is ideal for consumer healthcare solutions, enabling home monitoring of edema in cardiovascular or renal patients. Additionally, this sensor can monitor joint angles during knee, shoulder, and arm movements, providing data valuable for both rehabilitation and injury prevention. With its soft, wearable form, the sensor enhances patient experience by being easy to don and comfortable, supporting rehabilitation regimens and capturing critical recovery metrics.

## FEATURES AND BENEFITS OF STITCHED STRETCH SENSOR:

- Ease of manufacturing reduces costs by using current machinery
- Wide range of potential applications
- Able to apply anywhere on garment
- No need for alignment of sensors

**Phase of Development** - Stretch sensor design has been characterized and validated.

## Researchers

Lucy Dunne, Ph.D.

[External Link](http://dha.design.umn.edu) (dha.design.umn.edu)

## References

## Technology ID

20130122

## Category

Engineering & Physical Sciences/Design Specifications  
Engineering & Physical Sciences/Instrumentation, Sensors & Controls

## Learn more



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