Stretchis: Fabricating Highly Stretchable Sensors and Displays

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We present a simple and inexpensive fabrication method for creating Stretchis, highly stretchable user interfaces that combine sensing capabilities and visual output. We use Polydimethylsiloxan (PDMS) as the base material for a Stretchi and show how to embed stretchable touch and proximity sensors and stretchable electroluminescent displays.

Motivation

How can makers embed sensors and displays on objects that are

doubly curved

shape-changing

stretchable

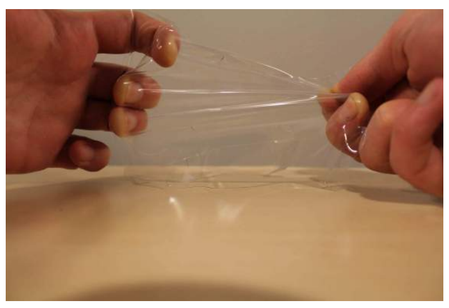
Multi-Layer

Aesthetics Layer

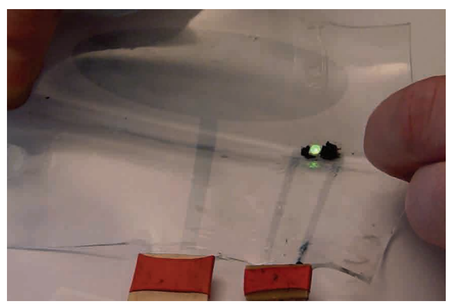
Sensing Layer

Display Layer

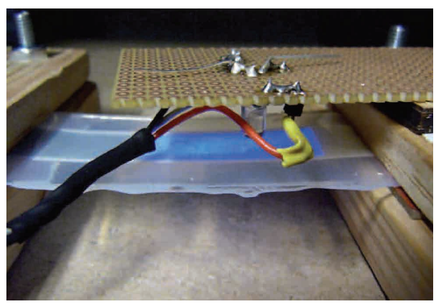
Base Layer (PDMS)



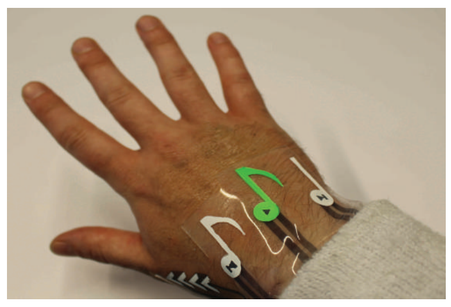
Base Layer (PDMS)



Sensing Layer



Stretchable Displays

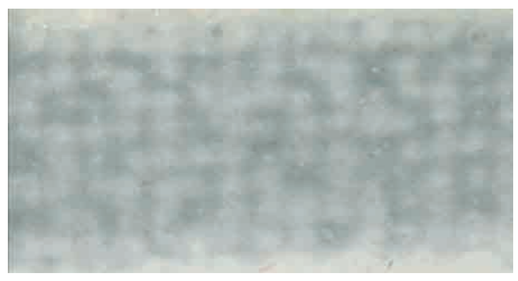


Aesthetics

Printing Stretchable Electronics

Water-based conductive ink cannot be printed on hydrophobic PDMS. We developed a inexpensive, simple and permanent method to print conductive ink on PDMS while remaining fully stretchable. AQUAPLAST DIY binder acts as a binding layer between conductive ink and PDMS.

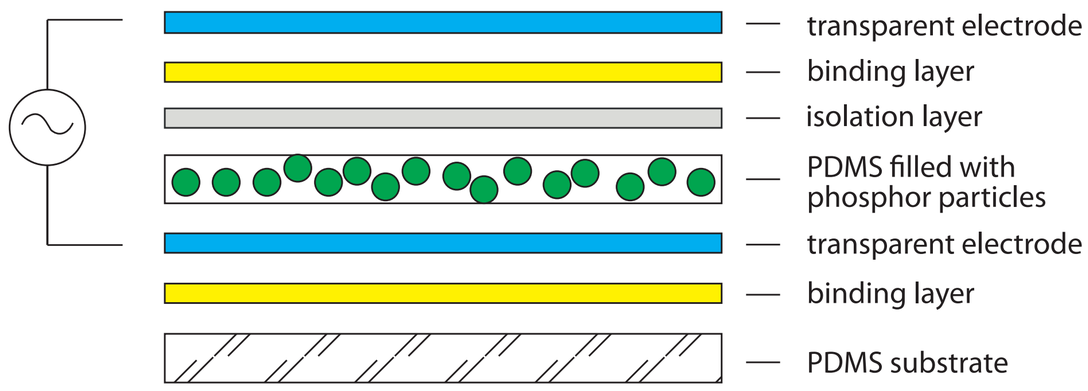
without binding layer



with binding layer

Fabrication

Layers of functional inks are printed on top of each other using screen printing as an accessible and inexpensive fabrication method.



Michael Wessely, Theophanis Tsandilas, and Wendy E. Mackay. 2016. **Stretchis: Fabricating Highly Stretchable User Interfaces**. In *Proc. of UIST'16*. ACM, New York, NY, USA, 697-704

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