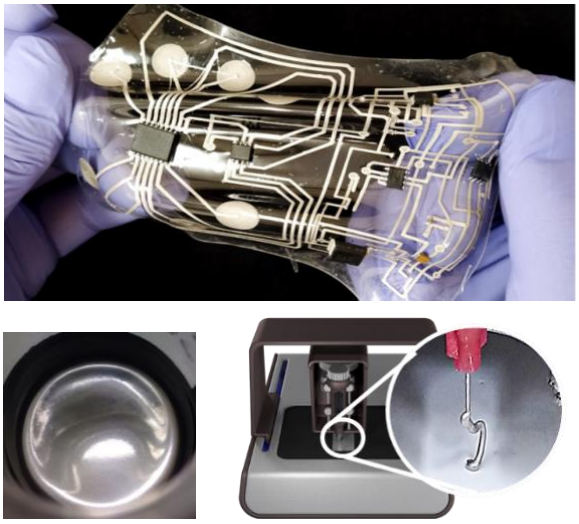
Technology Offer

Printed and Stretchable Electronics

KEYWORDS: Conductive Ink; E-Textile; Flexible Electronics; Printed Electronics; Recyclable Electronics; Sinter-free Ink; Stretchable; Stretchable Electronics; Wearable Monitoring.

Stretchable Electronics are radically changing the way we make electronics, and open the doors to new applications. However, existing methods for fabrication of stretchable electronics (e.g., conductive elastomers, wavy circuits, EGaIn microfluidics, etc.), tend to be complex, and costly.
New patent protected technology from University of Coimbra and Carnegie Mellon University permits scalable fabrication of very resilient stretchable circuits, using low-cost printing techniques. In addition, the printed ink does not require high temperature sintering and is conductive immediately after printing. This is made possible by a novel BiPhasic Composite, which is an alloy of Silver and Eutectic Gallium Indium Liquid Metal (EGaIn).



Developed ink and Printing using a low-cost printer

Unlike other approaches for fabrication of stretchable electronics that require manual fabrication steps, this technique allows for the first-time direct printing of stretchable circuits.

ADVANTAGES	APPLICATIONS
• High Resilient Circuits (>1000% strain). • Process Entirely at the ambient Conditions (No need for sintering step). • Compatible with Heat-Sensitive Substrates, including ultrathin medical wound dressing films. • Wide range of inks can be engineered with different properties. • Ready to Commercialize ink. • Rapid and Low-Cost Fabrication Technique. • Direct Microchip Interfacing (No need for additional conductive paste layer). • Supporting Technology for facile Microchip Integration already developed. • Recyclable Circuits (and Methods for Recycling them already developed).	• Biostickers for health monitoring. • E-textile (Health and Fashion). • Inks for 2D and 3D Printed Electronics. • Human Gait Monitoring Suit (Glove, Socks, Suits). • Pressure Monitoring Films (Rehab and Sport). • Touch control panels in cars. • Thin-film and Bendable Solar Cells. • Flexible Display. • Flexible and Stretchable Batteries and Super Capacitors. • Printed Antennas. • 5G and 6G Antennas and Surfaces. • IoT, and IoMT.

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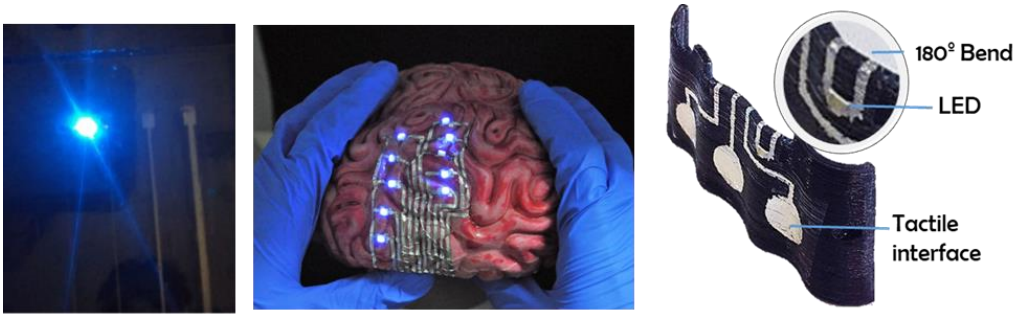
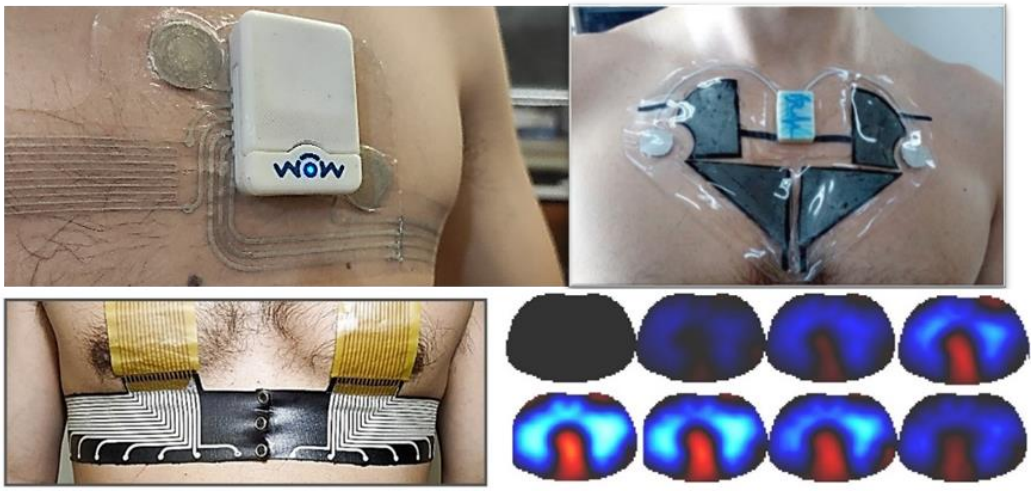


High Printing Resolution (Left), Circuit Transferred to a object with complex shape (middle), circuit printed and transferred to a 3D printed piece with 180° bending (Right), all produced with the protected materials and methods



Examples of Applications in health, through wearable biostickers and printed batteries (top), and e-textile imaging (buttom), using the ink and fabrication technology based on printing

VIDEO (QR Code or YouTube):

STAGE OF DEVELOPMENT: TRL 4

IPR LEGAL STATUS: Patent Pending in Europe, South Korea, USA , claiming PCT WO/2019/055680. Further patent applications under preparation and examination.

OWNERSHIP: The rights to the technology are held by the University of Coimbra and Carnegie Mellon University.

COLLABORATION SOUGHT: The University of Coimbra is seeking commercial partners interested in further developing the technology under a joint-collaboration, license agreement or acquiring the existing rights.

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