SINTEC

SOFT INTELLIGENCE EPIDERMAL COMMUNICATION PLATFORM

www.sintec-project.eu

THE PROJECT

SINTEC is a Horizon 2020 funded project that will provide soft, sticky and stretchable sensor patches that can be used multiple times and at longer periods. With its dynamic compliance and water repellent permeable encapsulation it withstands vigorous action, sweating and water; making it ideal for an active life.

Our vision of extensible smart patches is a non-invasive support system that can be used all the time, allowing an active elderly person to be warned when their health is slowly deteriorating (for example in case of heart or muscle problems) or to help a person recovering in a faster rehabilitation with sensory support and recommendations from an app without having to be in a physiotherapy institute for too long (eg. after a long illness, stroke or trauma).

The main advantages should be in comfort and that the sensors do not move so much relative to the skin. Hence, its major impact will not be in replacing other wearables but rather providing novel capability.

To demonstrate the advantages of the novel technology, SINTEC will apply it in clinical environment and in athletics performance evaluation.

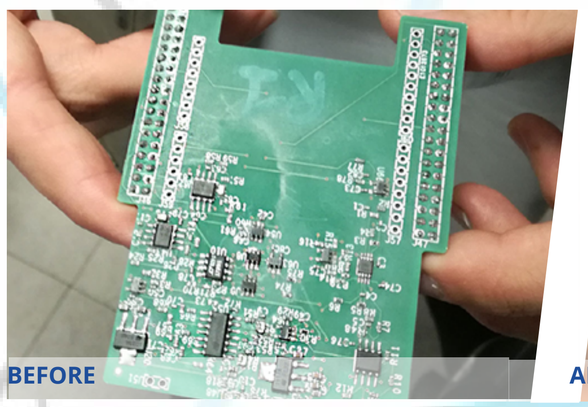
THE TECHNOLOGY

The aim of SINTEC is to advance a rigid-stretch PCB technology with stretchable substrate and liquid alloy, and to demonstrate its usability in complex applications, involving wearable sensing, embedded processing, and Fat-IBC. This will substantiate the advantages with this rigid-stretch technology and its improvement area. Industrial manufacturability and cost/scaling issues will be investigated.

Its unique features will enable a ground breaking intra body communication technique that provides secure communication at large bandwidth and low power, allowing for multiplex sensoric inputs from many sensor nodes on the body.

SINTEC MAIN OBJECTIVES ARE:

- To demonstrate manufacturing of large area rigid-stretch PCB technology stretchable substrate and liquid alloy interconnects;
- To demonstrate and compare the advantages of compliant and stretchable multi-use smart patches for Fat-IBC and low-energy Bluetooth communication;
- To demonstrate the advantages of compliant and stretchable multi-use smart patches for electrophysiological sensing;
- To validate the large area rigid-stretch PCB integration technology in laboratory.



EXPECTED RESULTS

1. Manufacturing large-area rigid-stretch PCB

To make a ground-breaking novel large-area rigid-stretch PCB technology available for manufacturing on an industrial scale

To present long stretchable wireless sensor patches that survives multiple-use, and excessive dynamic stretching without contact failure

To make an assembly protocol that allows for recycling of batteries and reuse of more expensive components

2. Integrating Fat-IBC with electrophysiological sensors

We propose the communication through the fat tissue, which offers lower losses for microwave propagation compared to other tissues. We have previously demonstrated the feasibility of using fat tissue as a low loss microwave transmission channel for IBC and we have demonstrated successful communication scenario, where real data has been transferred through Fat-IBC.

3. Device demonstration in sports and healthcare

The novel SINTEC technology will greatly increase the usability of measuring methods, especially for reasons such as:

- being less disturbing for athletes compared to existing technology;
- enable better compliance and adhesion to the human body and can handle an intense elite sports, an activity that results in large amounts of sweating;
- enable use in cold winter outdoor environment (-15 °C);
- from the user perspective, the newly developed technology will be equipped with an intuitive and easy-to-use user interface.

DETAILS

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