

# 4<sup>TH</sup> INTERNATIONAL CONFERENCE ON INNOVATIVE AND SMART MATERIALS

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## Smart clothing: Construction kit for multifunctional textile adapted electronic microsystems

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**Statement of the Problem:** Since the development of conductive thread material the processing according to classic industrial textile and clothing manufacturing techniques has been possible. However, there are weak points such as the connection of the conductive thread with the electronic components. Until now, very different techniques have been used to process textile circuits and to combine hard components with the flexible textile - often also from the classical craft. These prove to be neither economical nor reliable. However, this reliability plays a major role in the user acceptance of wearables. In addition, wearables often do not meet aesthetic requirements of the user. With the acquisition of information about the user the acceptance can be increased.

**Methodology and results:** On the basis of an exemplary scenario in the potential medical field of application, the research area of interactive textiles at the DFKI uses participative methods to ensure usability and to determine the technical system requirements. To solve the problem, a modular system is being developed in the BMBF funding project. This makes it possible to process the textile circuit on an industrial scale without purchasing new machines or acquiring additional special know-how. The problem of break resistance of the electrical conducting paths is solved by the embroidery process, which at the same time offers reliable contacting of the components. In order to allow many variations in the design and thus a multitude of applications, an interposer is developed that can accommodate various electronic components by means of a click system. In cooperation with the project partners Bosch, TITV Greiz, WESKO, Smart-Battery-Solutions and KUZ Leipzig, reduction of production costs, reliability of the system and high user acceptance are achieved.

### Biography

Daniela Wittmann has expertise in the field of textile and clothing technology with a focus on Smart Textiles. Her current work combines the industrial background of garment technology with the participative user-oriented knowledge from previous design-oriented projects at the Design Research Lab (University of the Arts Berlin) and the German Research Center for Artificial Intelligence (Interactive Textiles). In various interdisciplinary projects during the last years in the field of Smart Textiles she was able to gain her in-depth expertise. She focuses on participative methods and design methods for the conception of use cases for wearables and processing of intelligent textile demonstrators.

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