MASQUE 2 SENSOR SOCK

A stress-measuring sensor sock has been developed for individuals facing mental disabilities or dementia, who may encounter challenges in expressing their emotions. This solution is illustrated in the figure. If accumulated stress goes unnoticed it may exhibit as challenging behaviour, for example, aggression and self-injury. The sock can early detect stress and notify caregivers, due to Senti-Module, that was developed by the company Mentech. The sock measures electrodermal activity (EDA) of the skin, which increases due to sweat secretion. The device informs caregivers in real-time if stress is building up, enabling the caregiver to respond adequately and timely. With the current product, the number of use-cycles is limited. In order to prolong the lifespan while maintaining comfort, a study was conducted on integrating textile sensors into the sock design. These textile sensors offer a seamless integration of electronics as well as advanced design in terms of size, shape, and placement. Within the MASQUE 2 research is conducted into the flexible and stretchable wearable sensors, to increase reliability and lifespan, guarantee safe usage, have a high EDA signal and good stability.

TASK DESCRIPTION

The objective of this internship or graduation assignment is to develop a method to measure the electrical resistance of (knitted) conductive fabrics. As the sensors are knitted, they are inhomogeneous and anisotropic due to the arrangement of fibers and yarns. As a result, the electrical properties are dependent on the measurement direction. This makes it difficult to determine the resistance and, particularly, identify which conductive fabrics can be used for which applications. For example, the location and construction method of the electrodes influence the resistance of the fabric. Accordingly, the resistance variation of fabric samples in relation to the direction and degree of anisotropy must be studied and defined. We are therefore looking for a method to measure the electrical resistance of the conductive area (sensor or circuit), and not the single yarns. Next to the development of the method, factors that influence conductivity can be studied in our labs. For instance, the effects of wearing and washing, temperature, elongation, stretch, and bending on resistance can be studied. You'll work closely with material experts, textile engineers and experts on wearable & interaction technology within the research group.

PRACTICAL INFORMATION

Student profile: You are studying in the field of Electronics, Signal Processing or Biomedical engineering; You can do the assignment either as an internship or graduation research.

Location: Epy Drost building Saxion Enschede // SFT and AmI labs

Contact person(s): Sven Kamphuis **s.kamphuis@saxion.nl** & Laura Erkens **l.m.erkens@saxion.nl**

Let us know if you are interested by sending your CV and motivation letter.