



Sensor-integrated textiles / Neurofabric Technology

Smart textiles are garments that are manufactured with textile-integrated sensor technology. In the future, the synergy of textiles and miniaturized technology will primarily be used in the treatment of neuronal disorders, such as after strokes. Sensor- and actuator-supported clothing, however, also includes memo functions that refine and support the grasping function in the case of motor disorders or lack of sensation in the upper body. Another area of application is in diabetology through the use of integrated temperature sensors.

In processing, a distinction is made between textile-integrated (electronic components are embroidered on) and textile-based (use of electronically conductive fibers and coatings as a basis) sensor technology.

Connexstyle focuses on user-oriented rehabilitation garments designed to detect muscle activity and improve the rehabilitation process through a combination of specially designed TexPCBs (textile printed circuit boards) and laminated electromyography (EMG) sensors. The Tshirt is constructed based on a cotton shirt that contains sensor technology only in the inner sleeves. By means of a special silver coating laminated between thermoplastic material, it is possible to measure muscle movements via Dry Electrodes. The individual parts are connected to each other by a small module clip that sends the vital data to an app via Bluetooth. This construction system allows the rehabilitation shirt to be taken apart and washed without any problems, so that a high level of hygiene can also be guaranteed. By linking it to the associated app, the recorded data is analyzed, visual brief reports on the treatment progress are created and thus enables doctors and therapists to determine follow-up measures for the patient in a targeted manner.

The company Siren Care focuses with its Siren Socks on strict and continuous monitoring of body temperature to detect early signs of potential infections and prevent amputations. Research showed that controlling body temperature on the soles is the most effective form of therapy to prevent ulcers. Neurofabric is based on a special textile fabric that seamlessly incorporates microsensors and small thermistors at 6 different locations on the bottom of the foot that track the temperature on the bottom of the foot. The temperature is measured every 5 seconds and changes are checked. The sensors send a signal to a label embedded in the left sock, which transmits the temperature data to the Siren app and Siren Hub via Bluetooth. The label also contains an accelerometer that counts steps and a micro-controller unit that stores temperature data for up to 6 days. A big advantage is the reusability - the socks are suitable for both washing machine and dryer use.

Fact List

Base:

textile-integrated & textile-based sensor technology

Companies:

1. Connexstyle
2. Siren Care

Products:

1. Rehabilitation clothing
2. Diabetes socks

Special features:

1. TexPCBs transmit data of motion sequences and muscle movements via Bluetooth to app
2. Microsensors & thermistors help prevent wounds in diabetics

Smart Textiles are experienced by patients like a second skin!

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