

MONISHIRT - BODY MOTION TRACKING IN WEARABLES WITH LARGE AREA PRINTED SENSORS

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Due to demographic change, the part of working people with an age > 50 has doubled since 2000; nowadays over 8% of retired people still work (compared to 3.7% in 2000). At the same time the amount of the workforce for elder healthcare decreases.

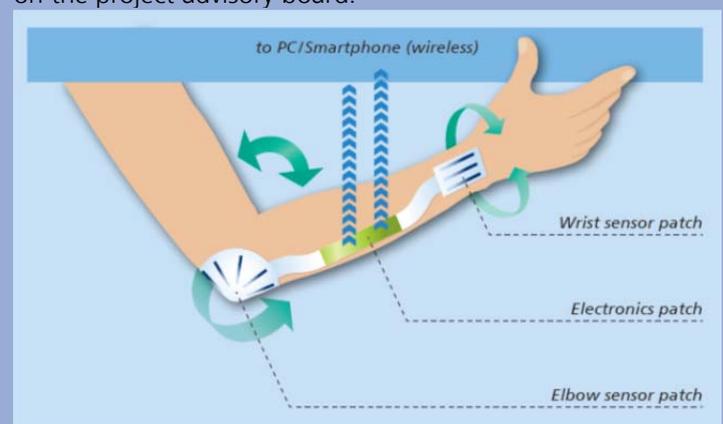
This demands for systems which help to monitor the healthy state of elderly in working environments and at home and to prevent wrong movement patterns which are harmful if practiced over a long time. Some monitoring systems are able to assist during rehabilitation of sport injuries or strokes. Such body motion tracking systems can help employers to ensure the health of their (older) employees, and provide a tool for doctors, healthcare people and relatives to get real-time information of the of monitored persons activity over a long time. A long work life of people, even for handicapped persons, will contribute positively to the participation at the social life. However, many monitoring systems are camera based and work in defined environments only. Additionally, they are prone for misuse and cause problems with respect to data safety. Wearable body motion tracking systems work independently on the local position and measure only the information needed for the distinctive purpose.

PROJECT SCOPE

This one-year feasibility study is aimed at the development of a first prototype as shown in the setup drawing on the right. The prototype will consist of two flexible sensor patches on foil, and be developed and manufactured by Fraunhofer ISC by using functional printing processes on foils and textiles.

Together with a subcontractor (Joanneum Research, which will adopt their PyzoFlex Technology) Fraunhofer ISIT will develop and manufacture electronics for data acquisition and transfer. Since piezoactive materials will only provide dynamic measurement, considerable efforts have to be spent on suitable algorithms for data processing, e.g. on avoiding drifts and other parasitic effects. Prototype reliability will be tested and stressed at ISIT mechanical testing setups. Moreover, ISIT will develop software for data visualization, as well as setting up a demonstrator for proving the feasibility of the system.

Once feasibility has been shown, a lead project (e.g. field tests for different applications, system integration into garments) is planned. Possible end users and distributors are already present on the project advisory board.



Schematic setup of MoniShirt sensing system.