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

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INTRODUCTION

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 demand 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

After this one-year feasibility studies a first prototype system has been finalized. It consists of two flexible sensor patches on foil, and was developed and manufactured by Fraunhofer ISC by using functional printing processes on foils and textiles.

Since piezoactive materials (PyzoFlex, Joanneum Research) will only provide dynamic measurement, considerable efforts had to be spent on developing suitable algorithms for data processing. ISIT also developed software for data visualization. Sensor function has been shown also when printed on textiles. Next a textile sensor wristband will be manufactured.



Lab demonstrator of MoniShirt sensing system.



Data visualization during sensor bending.