Projekt „Sensor-Chair“

Goal

The overall goal of this work is to detect and analyze a person's placement, movement, breathing and (optionally) heart rate during the sitting on a chair. The measurement is performed with the help of sensors. The result of this work will be used to pass the obtained pre-processed data into a health-coach algorithm placed in an external server. The server may be a part of the work, depending on the final definition.

Description

Based on both finished BSc-Final Project and MSc-Final Project and Innovation Lab Master Seminar the system with pressure sensors was developed. The first tested application was a real bed equipped with sensors underneath a bed mattress. After that the system implemented on a chair was tested. The proposed in this project application should by a sensor-system, integrated in a chair. The sensors build a sensor network connected to scalable bus architecture controlled by an embedded system. Sensors can be freely (re-)placed, added and removed for test purposes. The sensors network transfers the data to a small-embedded system for intermediate local storage and/or pushes the data out to an external server. Each sensor has the capability to detect changes in pressure and therefore position of body, movement and partly breathing can be detected. The server (depending on final definition of the work - part of this project) is collecting and processing the data for further analysis.

Task

- Integration of sensor-system in a chair and enhance of the sensor accuracy
- Add pre-processing and filter capabilities (e.g. extracting of breathing and optionally heart rate)
- Improve the frequency of the system
- Connect the system to the backend server infrastructure
- Adjustment of tasks is possible based student interest/knowledge.

Requirements

Programming skills (preferable - embedded system programming like Arduino or Intel Edison). Basic manual work skills.

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