Hochschule Konstanz
Department of Computer Science

UbiquitousComputing LABORATORY

Projekt „Sensor-Bed“

Goal

The overall goal of this work is to detect and analyze a person's movement, breathing and heart rate during sleep in a common bed overnight. The measurement is performed with the help of sensor(-s) placed between the mattress and bed sheet or under the mattress. The result of this work will be used to pass the obtained pre-processed data into a sleep-phase detection algorithm placed in an external server. The server may be a part of the work, depending on the final definition.

Description

Based on a finished BSc- and MSc-Final Project a real bed has been equipped with sensors underneath a bed mattress. 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 movement and partly breathing can be detected. The aim of this work is to develop a system with sensor placed between the mattress and bed sheet, extract movement, breath and heart rate data and compare the results with the current version of system.

Task

- Modify the developed system for using sensor placed between the mattress and bed sheet
- Improve the frequency of the system
- Add pre-processing and filter capabilities (extract movement, breath and heart rate data)
- 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).

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