



Specialization Module

Object Detection with Wearable and Attachable Wireless Sensors

Description:

Inferring user interaction with objects can improve the accuracy of various ubiquitous and pervasive computing applications. In this context, inertial MEMS sensor based inference methods are of particular interest, to facilitate unobtrusive sensing.

In this work, a signal correlation based object detection method should be developed and implemented in an existing Android application. The Android application connects to multiple wireless sensor nodes via Bluetooth Low Energy (BTLE) and receives its sensor data wirelessly. The inference method to be implemented shall detect user interaction with different objects, by attaching wireless inertial sensor nodes a) at various objects and b) in a glove worn by - or at the wrist of - the user and analyzing correlation of the received sensor signals.

The following tasks should be done within the scope of this work:

- Usage of wireless sensor nodes and an android application receiving its sensor data
- Implementation of an online re-sampling filter as a prerequisite for signal correlation computation
- Implementation of an online signal correlation based object detection algorithm
- Designing and performing experiments to quantify inference accuracy
- Evaluation of the approach and documentation of the acquired results

Requirements:

- Practice in Java and Android programming

Reference persons: Florian Grützmacher
Tel.: 0381/498-7289
Email: florian.gruetzmacher2@uni-rostock.de
Büro: Institut MD, Haus1, Room 1337