



## Specialization Module

# Object Detection with Wireless MEMS 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) at the users wrist and analyzing correlation of the received sensor signals.

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

- literature research about MEMS and sensor signal processing
- usage and extension of an android application receiving data from wireless sensor nodes
- 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

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