

Performance analysis of the BLE-based SensorTag platform

Scenario

Inertial based Body Sensor Network (BSN) are gaining more and more importance as research topics, wearable sensors are becoming pervasive and part of our daily life. The availability of a low-power radio standard such as Bluetooth Low Energy (BLE) allows to use modern smartphones or computers as data collectors.

TI introduced a new sensor for development, the SensorTag, which has all the commonly used sensors on a single board for quick evaluation and demonstration. The SensorTag includes a BLE transceiver, temperature sensor, humidity sensor, pressure sensor, accelerometer, gyroscope and magnetometer. The versatility of the SensorTag means limitless application possibilities including those for health and fitness, medical, educational tools, toys, remote controls, mobile phone accessories, proximity and indoor locationing.



Goals

The goal of the project is to evaluate the characteristics of the SensorTag platform, comparing it with a similar Bluetooth-based platform. The quality of the sensor data, maximum data rates, power consumption and integration of a multi-node BSN with CP and Android should be evaluated. Integration of the SensorTag platform with the CoRehab Riablo platform.

The project is modular and will be tailored to the capabilities of the student and on the type of the activity (stage or thesis). The work can vary from SensorTag testing and evaluation, to driver development for Android or Linux, to sensor data analysis and processing.

Project milestones

The project will be executed through out several steps, which will also depend on the capabilities of the student and on the duration of the work as stage (shorter) or thesis. Each step is a check point of the ongoing work and the interaction with the supervisors is strongly recommended.

- a) Analysis of the SensorTag platform and evaluation of its performance.
- b) Sensor data collection and comparison with state-of-the-art inertial BSN.
- c) SensorTag driver development and adaption for Android and Linux
- d) Integration with the CoRehab Riablo platform.

Educational aspects

This project is recommended to who want to acquire data analysis and software design experience in:

- BLE communication and BSN development.
- Inertial sensors data analysis.
- Drivers for real-time data collection and processing.

Suggested competences: familiarity with Android or Linux, familiarity with a programming language (C/C++, python), experience with inertial sensors.

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