Demo: AWSense – A Framework for Collecting Sensing Data from the Apple Watch

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ABSTRACT

We present a framework - AWSense - for eased sensing data collection from an Apple Watch wearable device. The framework eases the access, transmission and export of sensing data from the device. This data comprises: heart rate, raw acceleration, and computed device motion. In our demo, we present sample applications built on top of this framework to show its capabilities, of real-time presentation and recording of the sensing data.

1. INTRODUCTION

Mobile phones have been equipped with a variety of sensors, e.g. accelerometers, gyroscopes, which have been used in mobile sensing research [1]. With the introduction of wearable devices, this trend has transferred over to wearables like smartwatches and fitness trackers. Those sensors can be utilised to enhance mobile and wearable sensing research. We made our framework and two demo applications available on Github[1].

2. FRAMEWORK ARCHITECTURE

The *AWSense* framework consists of two parts: the core and connect framework.

The *AWSense Core* is designed to be run on the Apple Watch alone and it contains the main sensing functionality. It can be incorporated into watch apps to make data access easier. It allows the subscription to real-time sensing events, configuration of sensors and the start of a sensing session. The sensors currently available are:

- Raw acceleration (including gravity), configurable up to 100 Hz

- Device Motion (computed linear acceleration, rotation rate, gravity and attitude), configurable up to 100 Hz
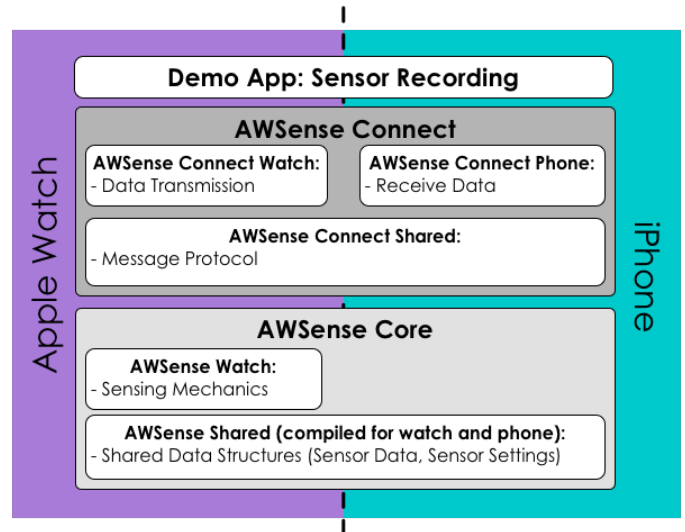
- Heart rate

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[1] https://github.com/MiezelKat/AWSense

The *AWSense Connect* part builds on top of the *Core* and manages the communication between the phone and watch. The phone-side API allows the the configuration of sensors, subscription to events and start of a remote sensing session on the Apple Watch. The configuration, sensor data, and events are all transferred through an own message protocol. This message protocol offers several message types to configure and control a sensing session. The wearable sensing data is buffered on the watch and sent in batches to decrease battery consumption and communication load. The buffer size and time between transmissions are hereby flexibly configurable to match the purpose of the application. There is the option to store the sensing data in a CSV format on the iPhone. It can then be downloaded for further use.

3. DEMONSTRATION

We will demonstrate a test applications built on top of the *AWSense* framework to show, real-time data presentation and data export. We will also present previous data recordings made with our framework.

4. REFERENCES

[1] N. Lane, E. Miluzzo, H. Lu, D. Peebles, T. Choudhury, and A. Campbell. A survey of mobile phone sensing. *IEEE Communications Magazine*, 48(9):140–150, 2010.