Contents

Chapter 1

Mobile Sensing Devices and Platforms

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A cyber-physical system (CPS) is a system of collaborating computational elements controlling physical entities. CPS represents the next stage on the road to the creation of smart cities through the creation of an Internet of Things, data and services. Mobility is one of the major characteristic of both CPS and IoT. In this Chapter, we discuss mobile sensing platforms and their applications towards different but interrelated paradigms such as IoT, sensing as a service, and smart cities. We highlight and briefly discuss different types of mobile sensing platforms and functionalities they offer. Mobile sensing platforms are more oftenly integrated with smart phones and tablet devices. The resource constrained nature of the mobile devices requires different types of designs and architectural implementations. We proposed a software-based mobile sensing platform called *Mobile Sensor Data Engine (MOSDEN)*. It is a plug-in-based scalable and extendible IoT middleware for mobile devices that provide an easy way to collect sensor data from both internal and external sensors. MOSDEN act as intermediary device that collects data from external sensors and upload to the cloud in real-time or on demand. We evaluate MOSDEN in both stand-alone and collaborative environments. The proof of concept is developed on Android platform.

constrained devices. MOSDEN can be installed in mobile devices (smart-phones and tablets) and can be used to collect data from both internal and external sensors. Due tothe plugin architecture, MOSDEN can retrieve data from virtually any smart device. Further, it has the capability to perform limited data processing and filtering tasks.

We also discuss a number of different ways that existing mobile system platforms have been used to support sensor data collection and processing. This chapter comprises a number of performance evaluation results where MOSDEN has been tested in standalone mode as well as in collaborative mode. In the later part of this chapter, we presented different real-world application that MOSDEN can be used. Finally, it is important to mentioned that the goal of building a unified middleware platform that supports a broad range of devices, ranging from low-level sensors to smart-phone to personal computers to the cloud, is yet to be achieved by the research community. Addressing the open challenges mentioned in the previously will help to move towards that direction.

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