Context-oriented Data Acquisition and Integration Platform for Internet of Things

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Abstract. In this paper, a data acquisition and integration platform for internet of things is proposed. The platform is developed under a cloud computing environment using a context-oriented approach. It collects sensor data from different types of sensor devices, including such as RFID, ZigBee sensors, GPS devices, temperature sensors, humidity sensors, luminance sensors, etc. This study first focuses on the of deployment, management, and control of different types of sensors for automatic acquisition of sensor data and its related ambient information, both of which will be stored in the IoT repository in a cloud environment. Then, context-oriented mechanisms are developed to produce context data. With the devised context broker, the data retrieved from the IoT repository can be used to produce the contextual portfolio, which is annotated with semantic description. The contextual portfolio then is stored into a cloud database as the User Portfolio. Finally, services for accessing the User Portfolio in the cloud are developed on a middleware platform, which is compliant with the OSGi standard. With the proposed platform, the acquired data is integrated into semantic contexts, which can be easily shared and reused among different mobile applications. Also, the context information can enhance mobile applications' usability by adapting to conditions that directly affect their operations.

Keywords: Internet of Things, Wireless Sensor Networks, Context Data, Middleware

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