A Sensory Oriented Model for Monitoring Ubiquitous Environments

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Extended Abstract

This abstract summarizes the work which will be presented as a poster entitled ”A Sensory Oriented Model for Monitoring Ubiquitous Environments”. It is concerned with the development of a sensory-oriented model to monitor user’s environments. The model supports a wide range of sensors and devices to be interconnected and managed through a simple interface. Each sensor is represented by an intelligent module called ”virtual driver” that manages the device and interacts with other modules in a network-like architecture. The gathered sensor data is fed to a local computer or to a remote server through Internet connection for monitoring.

W3C XML Schema Language [1] [2] is used to describe the interactions. This allows the use of well established standards, to guarantee the inter-operability, extensibility and scalability of the model. Indeed new sensors can be easily plugged into the system without necessarily rewriting major parts of the code, powerful configuration files allow to simply add new information recipients or to listen to other modules. The communication between the modules has been also standardized using W3C XSDs and can thus easily be adapted to several programming languages. Another dimension of the model is the interoperability between different technical worlds. Different modules can be implemented using different platforms and in different programming languages; this feature further increments the usability and decrements the developing costs as we do not have to implement several versions for several platforms. Typically, at least one module in the spider web must be considered as the decision maker; this module interprets the data and sends the interpreted information to the next modules.

In order to have a validation of the model implementation work has been conducted in the framework of a medical care scenario. Additionally two projects are under the way, emphasizing the use of the model in other scenarios. One explores the use of the model in an in-house temperature control, and the other one in a fire alarm system. Our ongoing and future work covers three research thrusts. The first one concerns the extension of the system with a security mechanism. The second one concerns the integration of the model in the CB-SEC framework [3]. Indeed the development of the model is part of a framework called CB-SeC (Context Based Service Discovery and Composition), whose aim is to develop a model for service discovery and composition in pervasive environments based on context. The third one concerns the enhancement of the model to take into account more features of the sensory information such as, imperfection and uncertainty.

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