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M. Teresa Garcia-Sebastian (Eds.)

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# Healthcare Information Fusion Using Context-Aware Agents

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**Abstract.** Context aware systems have evolved into complex information systems capable of providing large quantities of information obtained from network sensors with heterogeneous characteristics. This article proposes a multi-agent system that monitors patients and maintains a permanent fix on their location within a given context. The system uses information provided by sensors distributed throughout the environment. The system agents take the information they receive and fuse it to improve the decisions and actions involved in their processing. The multi-agent system implements a SOA-based platform, which allows heterogeneous Wireless Sensor Networks to communicate in a distributed way. This article presents the evaluation of the solutions provided by the agents through the information flow for the organization.

**Keywords:** Information Fusion, Context-Awareness, Multi-Agent Systems, Healthcare.

## 1 Introduction

There is currently a considerable variety of sensors that can observe user contexts. The diversity of characteristics: observable parameters, temporal and sample scales, means of acquisition, etc., is a source of practical problems that, if they are to be solved, must be clearly understood [2]. Within the user context, the high level of dynamism is tied to important restrictions and factors to consider. Data fusion can improve the perception of the context information and solve some of these problems. These methods seek to widen the observational space, increase the contextual and temporal coverage, reduce ambiguities, and supplant any shortcomings in any individually considered contextual observations [2].

The search for effective and non-invasive solutions within a user context brings us to context-aware systems. These systems store and analyze all of the relevant information that surrounds and forms part of the user context. The user's preferences, taste, location, frame of mind, activities, surroundings, vital signs, as well as the room temperature and lighting conditions, etc., comprise the information that can be classified as the initial context information, and can be easily captured from the user's residence. The information is usually acquired through sensors located in different Wireless Sensor Networks (WSN). The current trend for displaying information to

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