



2nd International Conference on Intelligent Computing, Communication & Convergence  
(ICCC-2016)

Srikanta Patnaik, Editor in Chief

Conference Organized by Interscience Institute of Management and Technology

Bhubaneswar, Odisha, India

## Security policies for Intelligent Health care Environment

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### Abstract

Patient monitoring can be performed remotely by wearing sensors on body and also embedding them in the environment. Personalized health care services have improved the quality of service. Healthcare applications require exchanging information among professionals to provide care services. So despite its advantages, these applications are more vulnerable to security risks. This study proposes development of ontology for the effective handling of IT-based healthcare system problems especially during an emergency situation.

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Peer-review under responsibility of the Organizing Committee of ICC 2016

*Keywords:* Sensor; Security; Ontology; SWRL; attacks

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### 1. Introduction

Wireless Sensor network for smart healthcare allow remote monitoring of elderly and chronic patients. Instead of a visiting of a patient to a doctor at regular intervals, here sensors are used to monitor patients physiological data to provide continues record to assist in diagnosis. The various heterogeneous sensor are integrated in the home environment. Emergency health care services include fast assessment and instant transportation to the nearest hospital. The traditional emergency services have integrating with technologies due to advancement in medical care to build applications to provide services which are efficient and dynamic. The main aim here is to improve the quality of life. Despite having various benefits of technologies there are a number of security risks. There is an issue of security of

remote data transfer. The major threat here is the data confidentiality. Any malicious user can access the patients personnel and health data when it is being transmitted over internet. A malicious user may alter the data and sent it over communication lines to a receiver. So integrity of data is another major threat. There may be a threats such as Denial of service, threat to privacy, threat to authorisation and also availability etc.[1]

The machine learning techniques are used to recognize user activities from data collected through sensors. The knowledge is the basic requirements of any artificial intelligence system. To design an intelligent system, knowledge needs to be captured, processed and communicated via an ontology. Context awareness is an integrated set of technologies to develop an application for improving the quality of health care.[2]

This paper is organised as follow. The section II describes the related work on security in healthcare. Section III describes the ontological model for health care along with policies to perform reasoning is described. Section IV discusses a scenario to test the model. Section V sums up the conclusion and future scope of the model.

**2. Related Work**

Research has been done on healthcare in areas like stress monitoring, cancer detection and monitoring of glucose level. HealthGear [3] is a real-time health care system in which wearable sensors are used to analyse patients data. Here sensors are attached via Bluetooth with a phone. Vivago is an alarm system, providing long-term monitoring of user’s activity profile and automatic alarm notification [4]. It consists of three main components: a wrist unit, a base station and an alarm receiving and routing software. CodeBlue[5] integrates Sensor nodes into adhoc architecture for monitoring disaster response in surroundings. Alarm-Net [5] presents pervasive and adaptive smart healthcare for nonstop scrutinizing using wireless sensors by creating a history log, while preserving the patient’s privacy. Further systems are: MIT’s PlaceLab [6], which includes a wearable and environmental sensing for proactive health care application. CareMedia [7], which uses multimedia information to track person activities. The Freeband Awareness project aims at the development of a context-aware infrastructure architecture [8]. None of the study had focused on developing relevant level of security for healthcare purposes.

**3. Secure Context Aware Framework**

According to the *home scenario*, medical sensors are placed on a patient’s body as well as in the environment to sense the physiological data. The Data is being transferred the data to the hospital staff with the help of their mobile **Base Station** which further forwards the data to the hospital staff with the help of their mobile **Base Station** and a cloud based server which further forwards the data to the hospital staff with the help of their mobile **Base Station** presented in the Fig. 1.

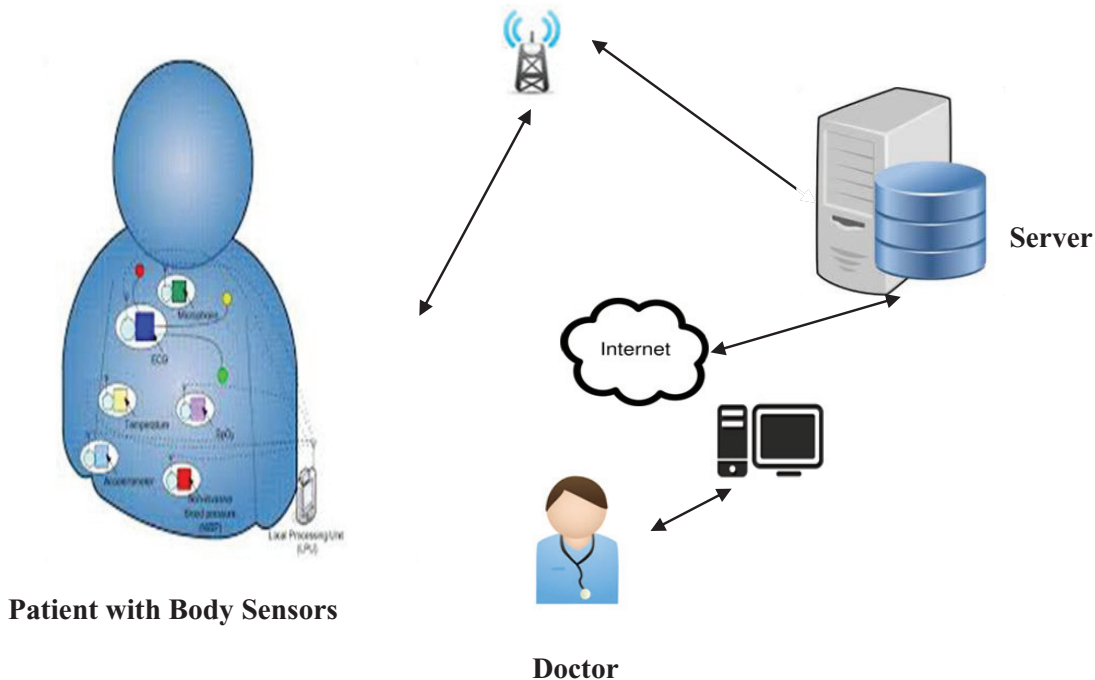


Fig. 1. Context Aware Secure Framework

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