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A survey to some sensor's data storages methods

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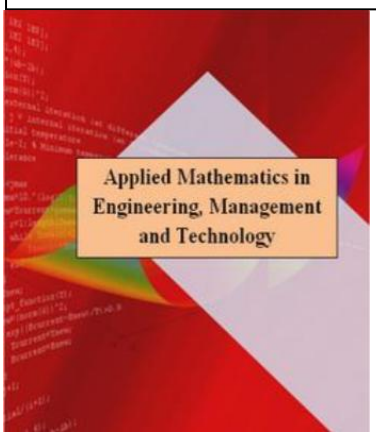

Abstract:

One of the characteristics of the post-PC era is to push computation from desktops and data centers out into the physical world. The area that we find especially interesting is networked sensors. Already today networked sensors can be constructed using commercial components using only a fraction of a watt in power on the scale of a few inches. Wireless sensor networks produce a large amount of data that needs to be processed, delivered, and assessed according to the application objectives. The way these data are manipulated by the sensor nodes and how they will store are fundamental issues.one way to stores data is using semantic web technologies. In this paper, we have done a brief survey on semantic sensor storage's models; storages that store data semantically.

Key words: semantic, sensor networks, SSW

1. Introduction:

In this section we have review some background information.

1.1. Semantic Web:

Without the constraints of geographic distance, the World Wide Web has become a natural platform for managing many human activities. The Web has been widely used to access and deliver information and services, conduct business transactions and form special user communities, such as message boards and chat rooms. With a universal Web browser, anyone from anywhere can access the Web independently at any time. While the flexibility and ease of information production and sharing is good, it is equally difficult or daunting to navigate, collect and track relevant data in this dynamic and open space. This problem is further aggravated as most of the data of interest change unpredictably.
The Semantic Web, as envisioned by Tim Berners-Lee and described by the W3C Semantic Web Activity, is an evolving extension of the World Wide Web in which the semantics, or meaning, of information on the Web is formally defined. Formal definitions are captured in ontologies, making it possible for machines to interpret and relate data content more effectively. The principal technologies of the Semantic Web include the Resource Description Framework (RDF) data representation model and the ontology representation languages RDF Schema and Web Ontology Language (OWL)[1,2].

1.2 sensor networks:

The role of Wireless sensor networks in modern technology and especially biomedical applications is obvious; and this was the main idea for many researches in the last decade. The applications of these networks are becoming wider nowadays. Smart environments represent the next evolutionary development step in building, utilities, industrial, home, shipboard, and transportation systems automation. Like any sentient organism, the smart environment relies first and foremost on sensory data from the real world. Sensory data comes from multiple sensors of different modalities in distributed locations. These data have to be stored somewhere for future usage like response to user queries, etc. sensors can send data in a form like semantic web technology. A functional block diagram of a versatile wireless sensing node is provided in Figure 1. A modular design approach provides a flexible and versatile platform to address the needs of a wide variety of applications [3], For example, depending on the sensors to be deployed, the signal conditioning block can be re-programmed or replaced. This allows for a wide variety of different sensors to be used with the wireless sensing node.

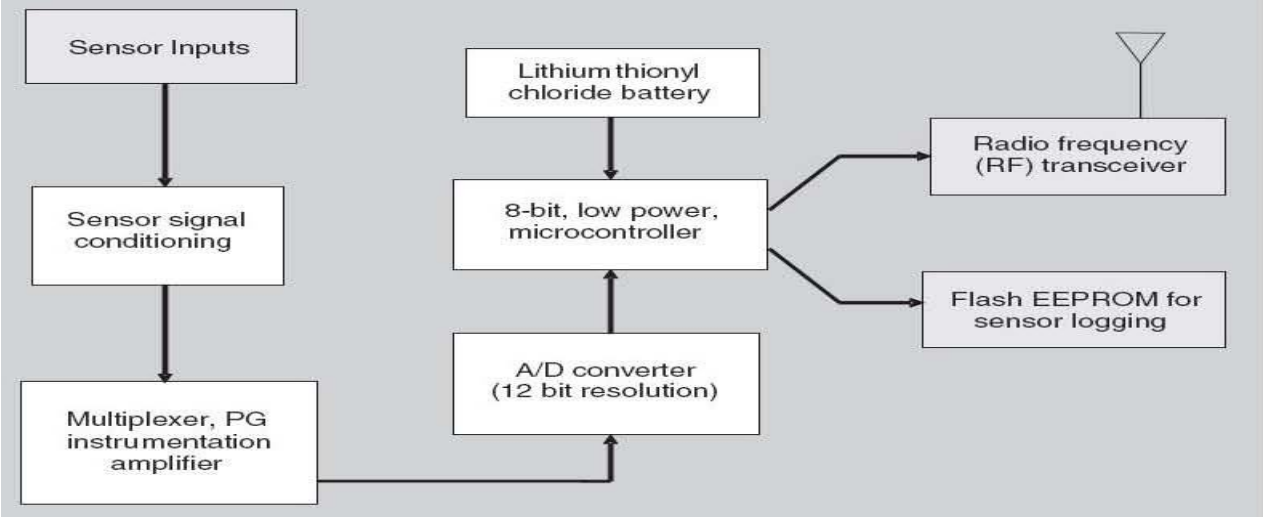

Fig.1 Wireless sensor node functional block diagram.

The microprocessor has a number of functions including:
1) Managing data collection from the sensors
2) Performing power management functions
3) Interfacing the sensor data to the physical radio layer
4) Managing the radio network protocol

Section 2 describes some semantic sensor data's storage; send data's in semantically form. The concluding remarks are given in Section 3.

2. Related Works:

In this section we have a survey to some researches on sensor networks.

2.1 Wireless sensor networks for habitat monitoring:

The WSNs are used for number of purposes. A piece of interesting research work on WSN applications was carried out by Mainwaring et al. [4] on real-world habitat monitoring. They proposed a system architecture for sensor networks to carry out environmental and behavioral monitoring of living beings. However, their research was not oriented towards the data management of sensor networks.

2.2 SSN:

Many researchers have also realized the problem of semantic integration of sensor data and try to address it using semantic web technologies. A theoretical discussion has been done by Lionel et al. [5], who proposed a concept of Semantic Sensor Net (SSN). They have identified the same associated problems for heterogeneous sensor networks and sensor data. A SSN is a heterogeneous sensor network which enables dynamic tagging of semantic information to sensor data so that it can be integrated and reused across various applications.

2.3 Es3n:

Lewis et al. [6] presented the ES3N tool to address the issues of efficient sensor data storage and query processing. In other words, they present a Data Management Tool called ES3N, which uses Semantic Web techniques to manage and query data collected from a minidome Sensor Network.

2.4 ontosensor:

Russomanno et al [7] discuss a broad sensor ontology which is called OntoSensor. OntoSensor primarily adapts parts of SensorML descriptions and uses extensions to the IEEE Suggested Upper Merged Ontology (SUMO) to describe sensor information and capabilities. The ontology is developed to support sensor information system applications in dynamic sensor selection, reasoning and querying various types of sensor. OntoSensor relies on deep knowledge models and provides extensive information about different aspects of the sensor nodes and devices. The ontology is represented in OWL format and the authors have discussed the advantages of the proposed approach compared to SensorML and XML based solutions. The main enhancement is providing self-descriptiv meta-data for the transducer elements and embedded semantics in the descriptions which could be utilised in various sensor discovery and reasoning applications. Although OntoSensor illustrates a semantic approach to sensor description and provides an extensive knowledge model, there is no distinctive data description model to facilitate interoperable data representation for sensors observation and measurement data.

2.5 SSW:

Seth and Hanson [8] discuss the idea of a semantic sensor Web framework to provide enhanced meanings to sensor data and to create situation awareness for the sensor networks.
The semantics of sensor nodes is described within space and time dimensions, and it also includes thematic data. The spatial meta-data provides sensor location and data information in terms of a geographical reference system, location reference, or named locations. The main assumption is that although the sensor's location might be changing, its location can be determined relative to the moving object. The temporal meta-data refers to the time interval duration whose sensor data has been captured. Thematic meta-data provides descriptive information about the sensor node which can be derived by sensor data analysis, and utilizing tagging and textual descriptions [9].

2.6 Sense and Sens'ability:

They describe a semantic model for heterogeneous sensor data representation. We use common standards and logical description frameworks proposed by the semantic Web community to create a sensor data description model. The work describes a sensor data ontology which is created according to the Sensor Web Enablement (SWE) and SensorML data component models. We describe how the semantic relationship and operational constraints are deployed in a uniform structure to describe the heterogeneous sensor data[10].

2.7 SemSOS:

They leveraging semantic technologies in order to provide and apply more meaningful representation of sensor data.
More specifically, we are modeling the domain of sensors and sensor observations in a suite of ontologies, adding semantic annotations to the sensor data, using the ontology models to reason over sensor observations, and extending an open source SOS implementation with our semantic knowledge base. This semantically enabled SOS, or SemSOS, provides the ability to query high-level knowledge of the environment as well as low-level raw sensor data [11].

2.8 evaluation and compare

M.Gheisari [12] evaluates and compares two methods of storing data in sensor networks.
They use a sample data at first they have shown in SSW frame work and then storing them in ontology form. They have evaluated their simulation with the use of J-sim sensor network simulator. They conclude that is some applications that it is important to stores fewer data we can use SSW frame work because data transmission is less than ontology form.

3. Conclusion and future work:

In recent years advances in energy efficient design and wireless technologies have enabled exciting new applications for wireless devices .These applications span a wide range including real time and streaming video

and audio delivery and remote monitoring using networked micro sensors personal medical monitoring and home networking of everyday appliances .While these applications require high performance from the network they suffer from resource constraints that do not appear in more traditional wired computing environments .In particular wireless spectrum is scarce often limiting the bandwidth available to applications and making the channel error prone and the nodes Are battery operated often limiting available energy .if we can store sensors data more effectively, we have sensor networks more effective and life time. in this paper we have a survey on some of methods that use for storing data. Storage model have a kind of different models. Most of these methods have a lack of efficiency. We also describe some lack of these methods. In future work we have a plan to introduce a new sensor data storages.

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