ISSN: 0474-9030
Vol-68-Issue-19-January-2020

WIRELESS SENSOR NETWORK IMPACT ON HUMAN LIFE

[1]MRS. T. HASHINI, [2]MADHUMITHA. D AND INDRAKSHI . S
[1]ASSISTANT PROFESSOR, [2,3]STUDENTS (I B.SC. IT)
B.SC. INFORMATION TECHNOLOGY
PSGR KRISHNAMMAL COLLEGE FOR WOMEN COIMBATORE

ABSTRACT-

wireless sensor network(WSN) refers to a group of spatially dispersed and dedicated sensors for monitoring and recording the physical conditions of the environment and organizing the collected data at a central location . This paper briefly explains about wireless networks impact in the life of human.

Keywords-human,monitoring,industry,mobility,nodes,sensors,networks,data aggregation.

INTRODUCTION

Wireless sensor networks (WSNs) are getting world wide attention. In recent years ,the rapid development in miniaturization; low power wireless communication, micro sensor, and microprocessor hardware have enabled the development of low-cost, low-power, multifunctional sensor nodes. Large number of innovative set of application for WSN's as been proposed in (Marronet al.,2006). It include some new categories of application like human augmentation and enhancing social interaction. Human augmentation refers to all the ubiquitous co operating object technology that can be employed to assist our daily activities. Whereas enhancing social interactions uses co operating objects to establish or maintain social relationships among people. Our proposed idea is to use tiny sensors (either wearable or implantable) into the human body to monitor vital body parameters. The persons character (personality type, mood and psychological condition) or determined in different contexts through these parameters. The person is notify with his own character and the character of counterpart in order to increase level of understanding.

IMPACT IN HUMAN LIFE

A. Area monitoring

Area monitoring is a common application of WSNs. In area monitoring, the WSN is deployed over a region where some phenomenon is to be monitored. A military example is the use of sensors to detect enemy intrusion; a civilian example is the Geo-fencing of gas or oil pipelines.

ISSN: 0474-9030
Vol-68-Issue-19-January-2020

B. ***Health care monitoring***

There are several types of sensor networks for medical applications: implanted, wearable, and environment- embedded. Implantable medical devices are those that are inserted in the hltyuman body. Wearable devices are used on the body surface of a human or just at close proximity of the user. Environment- embedded systems employ sensors contained in the environment.

ENVIRONMENTAL/ EARTH SENSING

C. ***Air pollution monitoring***

Wireless sensor networks have been deployed in several cities (Stockholm, London and Brisbane) to monitor the concentration of dangerous gases for citizens. These can take the advantage of the ad hoc wireless links rather than wired installations, which also make them more mobile for testing readings in different areas.

D. ***Landslide detection***

A land slide detection system makes use of a wireless sensor network to detect the slight movements of soil and changes in various parameters that may occur before or during a landslide. Through the data gathered it may be possible to know the impending occurrence of land slides long before it actually happens.

E. ***Water quality monitoring***

Water quality monitoring involves analyzing water properties in dams, rivers, lakes and oceans, as well as underground water reserves. The use of many wireless distributed sensors enable s the creation of a more accurate map of the water status, and allows the permanent of monitoring stations in locations of difficult access, without the need of manual data retrieval.

IMPACT IN INDUSTRIAL

A . Machine health monitoring

Wireless sensor networks have been developed for machinery condition -based maintenance(CBM) as the offer significance cost savings and enable new functionality .Wireless sensor can be placed in locations difficult or impossible to reach with a wired system , such as rotating machinery and untethered vehicles.

B. Data logging

Wireless sensor networks also are used for the collection of data for monitoring of environmental information . This can be as simple as monitoring the temperature in a fridge or the level of water in over flow tanks in nuclear power plants . The statistical information can then be used to show how systems have been working . The advantage of WSNs over conventional loggers is the " Live " data feed that is possible.

C. Water / waste water monitoring

ISSN: 0474-9030
Vol-68-Issue-19-January-2020

Monitoring the quality and level of water includes many activities **s**uch as checking the quality of underground or surface water and ensuring a country's water infrastructure for the benefit of both human and animal. It may be used to protect the wastage of water

CHARACTERISTICS OF WSN

The main characteristics of a WSN include

- Power consumption constraints for nodes using batteries or energy harvesting. Examples of suppliers are Revibe energy and Perpetuum.
- Ability to cope with node failures (resilience)
- Some mobility of nodes(for highly mobile nodes see MWSNs)
- Heterogeneity of nodes
- Homogeneity of nodes
- Scalability to large scale of deployment
- Ability to withstand harsh environmental conditions
- Ease of use
- Cross – layer design[18][19][20]

PLATFORMS FOR WSN

F. Wireless

There are several wireless standards and solutions for sensor node connectivity . Thread and ZigBee can connect sensors operating at 2.4GHz with a data rate of 250kbit/s. Many use a lower frequency to increase radio range (typically 1 km), for example Z-wave operates at 915 MHz and in the EU 868 MHz has been widely used but these have a lower data rate (typically50kb/s). The IEEE 802.15.4 working group provides a standard for low power device connectivity and commonly sensors and smart meters use of these standards for connectivity .With the emergence of Internet of things, many other proposals have been made to provide sensor connectivity . LORA[22] is a form of LPWAN which provides long range low power wireless connectivity for devices, which has been used in smart meters . Wi-SUN[23] connects devices at home . NarrowBand IOT[24] and LTE-M[25] can connect up to millions of sensors and devices using cellular technology.

G. Routing Protocols

Wireless sensor networks are composed of low-energy, small-size, and low-range unatttended sensor n odes. Recently, it has been observed that by periodacally turning on and of the sensing and communication capabilities of sensor nodes , we can signifcantly reduce the active time and thus prolong network life time . However , this duty cycling may result in high network latency , routing overhead, and neighbor discovery delays due to asynchronous sleep and wake-up scheduling. These limitations call for acountermeasure for duty-cycled wireless sensor networks which should minimize routing information , routing traffic load, and energy consumption. Researchers from Sungykyunkwan University have proposed a lightweight non-

ISSN: 0474-9030
Vol-68-Issue-19-January-2020

increasing delivery-latency interval routing refered as LNDIR. This scheme can discover minimum latency routes at each non-increasing delivery-latency interval instead of each time slot. Simulation experiments demonstrated the validity of this novel approach in minimizing routing information stored at each sensor further more this novel can also guarantee the minimum delivery latency from each source to the sink. Performance improvements of up to 12-fold and 11-fold are observed in terms of routing traffic load reduction and energy efficiency, respectively, as compared to schemes .[26]

H. Operating System

Operating systems for wireless sensor networks nodes are typically less complex than general-purpose operating system. They more strongly resemble embedded systems , for two reasons . First , wireless sensor networks are typically deployed with a particular application in mind, rather than as a general platform. Second ,a need for low costs and low power leads most wireless sensor nodes to have low-power microcontrollers ensuring that mechanisms such as virtual memory are either unnecessary or too expensive to implement.

I. Online Colloborative Sensor Data Management Platforms

Online collaborative sensor data management platforms are on-line database services that allow sensor owners to register and connect their devices to feed data into an online database for storage and also allow developers to connect to the database and built their own applications based on that data. Examples include Xively and the Wikisensing platform. Such platforms simplify online collaboration between users over diverse data sets ranging from energy and environment data to that collected from transport services . Other services include allowing developers to embed real-time graphs & widgets in websites; analyse and process historical data pulled from the data feeds ; send real-time alerts from any data stream to control scripts , devices and environments.

SIMULATION

At present agent-based modeling and simulation is the only paradigm which allows the simulation of complex behavior in the environments of wireless sensor and ad hoc networks is a relatively new paradigm. Agent-based modeling was originally based on social simulation. Network simulation like Opnet , Tetcos Netsim and NS can be used to simulate a wireless sensor network

OTHER CONCEPTS OF WSN

J. Security

Infrastructure –less architecture(i.e. no gateways are included, etc.) and inherent requirements (i.e. unattended working environment, etc.) of WSNs might pose several weak points that attract adversaries. Therefore, security is a big concern when WSNs are deployed for special

ISSN: 0474-9030
Vol-68-Issue-19-January-2020

applications such as military and healthcare. Owing to their unique characteristics, traditional security methods of computer networks would be useless(or less effective) for WSNs. Hence ,lack of security mechanisms would cause intrusions towards those networks. These intrusions need to be detected and mitigation method should be applied.

K. Distributed sensor network

If a centralized architecture is used in a sensor network and the central ode fails, then the entire network will collapse, however the reliability of the sensor network can be increased by using a distributed control architecture. Distributed control is used in WSNs for the following reasons:

- Sensor nodes are prone to failure,
- For better collection of data,
- To provide nodes with backup in case of failure of the central node.

L. Data integration and sensor web

The data gatheesred from wireless sensor networks is usually saved in the form of numerical data in a central base station . Additionally , the Open Geospatial Consortium(OGC) is specifying standards for interoperability interfaces and metadata encodings that enable real time integration of heterogeneous sensor webs into the internet, allowing any individual to monitor or control wireless sensor networks through a web browser.

M. In-network processing

To reduce communication costs some algorithms remove or reduce nodes' redundant sensor information and avoid forwarding data that is of no use. This technique has been used, for instance, for distributed anomaly detection[32][33][34][35] or distributed optimization. [36] As nodes can inspect the data they forward, they can averages or directionality for example of readings from other nodes. For example, in sensing and monitoring applications, it is generally the case that neighboring sensor nodes monitoring an envi ronmental feature typically similar values. This kind of data redundancy due to the spatial correlation between sensor observations inspires techniques for in-network data aggregation and mining.

Aggregation reduces the amount of network traffic which helps to reduce energy consumption on sensor nodes. [37][38] Recently , it has been found that network gateways also play an important role in improving energy efficiency of sensor nodes by scheduling more resources for the nodes with more critical energy efficiency need and advanced energy efficient scheduling algorithms need to be implemented at network gateways for the improvement of the overall network energy efficiency.[19][39]

N. Secure data aggregation

This is a form of in-network processing where sensor notes are assumed to be unsecured with limited available energy, while the base station is assumed to be secured with unlimited available energy. Aggregation complicates the already existing security challenges for wireless sensor networks [40] and requires new security techniques tailored specifically for this scenario. Providing security to aggregate data in wireless sensor networks is known as secure data

ISSN: 0474-9030
Vol-68-Issue-19-January-2020

aggregation in WSN. [38][40][41] were the first few works discussing techniques for secure data aggregation in wireless sensor networks.

POSITION OF WSN IN HUMAN LIFE

Wireless sensor networks continue to advance due to the recent dramatic progress in sensor devices. The innovative use of the received signal strength indicator(RSSI)will yield new applications in human position estimation, an important function in safe and secure services, especially for the elderly, and energy efficiency in small areas or homes. A simple method for estimating human position, together with a new signal processing procedure that uses RSSI. This method is simple and has the exciting benefit of compatibility with existing devices and existing wireless sensor networks, the current RSSI function is employed more effectively. Two experiments verify the performance of the proposed method. An experiment in a laboratory building shoed good performance with 100% accuracy. However, in an actual field trial in a library hosting several wireless sensor device its accuracy fell to 75%. Estimation performance is performance is expected to improve with the use of multiple paths. Wireless sensor networks have been used to monitor bioelectric signals generated by the human body. However, since the dimensions and capabilities of the network nodes are small and limited, a problem is generated inherently by the energy consumption and radioelectric interference. In the former scheme, users can be monitored for long time periods considering a low data generation. On the other hand, the latter scheme allows expediting transmission of important data when energy efficieny is not relevant. the advances in electronics and solid-state technologies have also allowed working with wireless devices that provide the facility to use them remotely without the need for connection or wires

REFERENCES

- Dargie,W. and poellabauer,,C(2010).Fundamental of wireless sensor networks; theory and practice. John Wiley and sons.pp.168-183,191-192
- Sohraby, K.. ,Minoli,D. ,Znati,T.(2007).wirelesssenor networks: theory, and practice. John Willey and Sons.Pp.168-183,191-192.
- Sohraby , k., Minoli,D., Zinati,T.(2007). Wireless sensor networks: technology, protocols, and applications. John Wiley and Sons.Pp.203-209.
- Oliveria ,Joao; Goes, Joao(2012).
- Perris, V.(2013).”Highly integrated wireless sensing for body area network applications”.
- Tony O’Donovan; John O’Donoghue; Cormac Sreenan; David Summon Philip O’Reilly; Kieran A. O’Connor.(2009).
- Spie (2013).”Vassili Karanassions: Energy scavenging to power remote sensors” .SPIE Newsroom.
- Tiwai, Ankit; et al.(2007).”Energy-efficient wireless sensor design.

