Wireless Sensor Network: A Revolutionary Technology for Changing the Way of Life

Mohammad Ibrar
Dept. of Computer Science, Ranchi University, Ranchi

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Abstract - **Wireless networks are taking the dominant position due to coverage of location difficult to wire, to satisfy the requirement of mobility and ad hoc networking. In a few years from now, we will notice a broader range of wireless devices accessing the Internet in many areas. This technique is being developed and trying to fulfill the requirements of their needs. In fact this revolutionary technique has changed our life and also trying to achieve new technique in the field of sensor. WSNs are regarded as a revolutionary information gathering method to build the information and communication system which will greatly improve the reliability and efficiency of infrastructure systems. Compared with the wired solution, WSNs feature easier deployment of devices. With the rapid technological development of sensors, WSNs will become the key technology for IoT.**

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I. INTRODUCTION

Wireless sensor networks appearing as consequences of the developments in wireless communication, micro- electro-mechanic systems technology and electronics have many promising application areas for the future. Due to its challenges and characteristic wireless networking has become very popular. As we are seeing in today's era that Wireless networks are covering almost all area such as digital cameras, automobiles, security system, kitchen appliances and etc. KUROSE and ROSS wrote some time ago, that wirelesses devices that communicate with the Internet may be present everywhere: on walls, in our cars, in our bedrooms, in our pockets and in our bodies. So we can analyses, many of them have been developed and being researched in many areas.[1][8]

As various kinds of wireless devices become more common, the flow of content will increase as well. Movies will be downloaded in a flash and transported to any one of a number of viewers. Music will flow to cell phones. Music videos and news clips will be downloadable anywhere, anytime. These developments create new challenges for the creators and owners of this content.

The prevalence of wireless gadgets and networks is changing how people interact with one another. Social plans are made later in the day; conversations happen more frequently but with more brevity, and expectations evolve.[4]

The Internet of Things (IoT) is a scenario in which objects, animals or people are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. IoT has evolved from the convergence of wireless technologies, micro-electromechanical systems (MEMS) and the Internet.[7]

A thing, in the Internet of Things, can be a person with a heart monitor implant, a farm animal with a biochip transponder, an automobile that has built-in sensors to alert the driver when tire pressure is low -- or any other natural or man-made object that can be assigned an IP address and provided with the ability to transfer data over a network. So far, the Internet of Things has been most closely associated with machine-to-machine (M2M) communication in manufacturing and power, oil and gas utilities. Products built with M2M communication capabilities are often referred to as being smart. (See: smart label, smart meter, and smart grid sensor)

We would be able to track and count everything and greatly reduce waste, loss and cost. We would know when things needed replacing, repairing or recalling and whether they were fresh or past their best." So as we can see the use of this revolutionary technology in many areas like:

Military sensor networks to detect and gain as much information as possible about enemy movements, explosions, and other phenomena of interest.[3][8]

Sensor networks to detect and characterize Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) attacks and material.
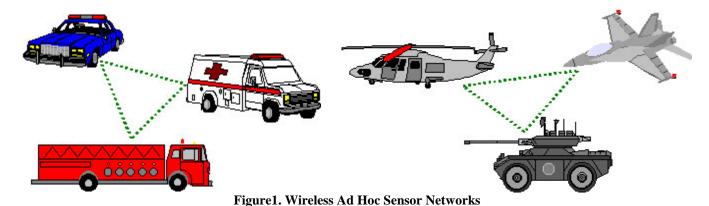
Sensor networks to detect and monitor environmental changes in plains, forests, oceans, etc.

Wireless traffic sensor networks to monitor vehicle traffic on highways or in congested parts of a city. Wireless surveillance sensor networks for providing security in shopping malls, parking garages, and other facilities. Wireless parking lot sensor networks to determine which spots are occupied and which are free.

II. WIRELESS SENSOR NETWORKS

A wireless ad hoc sensor network consists of a number of sensors spread across a geographical area. Each sensor has wireless communication capability and some level of intelligence for signal processing and networking of the data. A wireless sensor network consists of a large number of sensor nodes, which are densely deployed either inside the phenomenon or very close to it. Wireless ad hoc sensor networks offer certain capabilities and enhancements in operational efficiency in civilian applications as well as assist in the national effort to increase alertness to potential terrorist threats.[5]

With the coming availability of low cost, short range radios along with advances in wireless networking, it is expected that wireless ad hoc sensor networks will become commonly deployed. In these networks, each node may be equipped with a variety of sensors, such as acoustic, seismic, infrared, still/motion video camera, etc. These nodes may be organized in clusters such that a locally occurring event can be detected by most of, if not all, the nodes in a cluster. Each node may have sufficient processing power to make a decision, and it will be able to broadcast this decision to the other nodes in the cluster.[6]

Figure1. Wireless Ad Hoc Sensor Networks

I. ENERGY EFFICIENT PROTOCOLS

There have been several network routing protocols proposed for wireless networks that can be examined in the context ofwireless sensor networks. Since energy efficiency is more important for wireless sensor networks than any other networks, more research works have already been done in routing in WSN. In general, data transmission in wireless communication takes more power than data processing. Whenever the nodes are transmitting more number of data proportionately their battery power also get reduced. To reduce the data size we can go for data fusion or aggregation techniques. Data fusion is that in which the sensed data from different nodes are fused at certain point suitable for the transmission in its reduced size.[4]

Wireless sensor Network Provide a bridge between the real physical and virtual Worlds. It has become very popular due to its large number of characteristics like Power consumption constraints for nodes using batteries or energy harvesting, ability to cope with node failures (resilience) mobility of nodes, heterogeneity of nodes, scalability to large scale of deployment and many more. Energy efficient is one of the most important characteristics of wireless sensor network. Energy Efficiency i.e. utilizing the available limited amount of energy in deploying the network in the most efficient and reliable way is perhaps the greatest challenge faced by an ad-hoc system.[8]

II. CONCLUSION

In today's era, wireless sensor networks have become very popular. And in every where revolutionary technology of WSN can be seen This is because of their low cost, less power requirement, performance and high potential application areas. Recent advances in wireless technology have enabled the deployment of low-cost wireless solutions that are capable of robust and reliable communication in the resources and manufacturing industries. Wireless application areas such as networking, sensors, and asset tracking offer great opportunities for production optimization where the use of wired counterparts prove to be prohibitive, expensive or difficult to implement and maintain. Data that is gathered from such wireless devices and networks is quite valuable and leads to new and innovative solutions that may aid the resources and manufacturing industries in preventing problems, reducing operating costs and generally improving operations using wireless sensor networks.

III. REFERENCES

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