

# THE INTERNATIONAL JOURNAL OF SCIENCE & TECHNOLEDGE

## Advancement in Wireless Sensor Networks: An Idea

**Mrinal Pandey**

Student, Department of Computer Science & Engineering,  
Dr. A.P.J Abdul Kalam Technical University, Lucknow, Uttar Pradesh, India

**Abstract:**

*We live in the era where all of our surroundings are full of vibrations, radiations which are modulated and then used as signals (ex EM, Radio etc.) further these signals with different bandwidths are used for transmitting information and data exchange using Wireless Network. In this paper, I hereby represent an idea that gives an enhancement in the field of Wireless Sensor Networks by using the telecommunication channel to transfer information with the help of C&C server at the backend.*

**Keywords:** Botnet, distributed computing, jammers, machine learning, wireless sensor networks

### 1. Introduction

Our atmosphere is full of cosmic radiations. Basically there are four types of radiations namely, the electromagnetic (EM) radiation, particle radiation, acoustic radiation, and the gravitational radiation. Commonly we use the electromagnetic radiation as the way of wireless communication from one source node to another. Though these radiations have very wide range but we utilise them and mould them according to our application depending upon their frequencies and bandwidths. We have seen many examples of wireless networks in our daily life like controlling the drones from the base stations, the telecommunication etc.

Similarly another excellent example is shown in type of intelligent system is of WSNs or simply the Wireless Sensor Networks. It is a network of dedicated sensors deployed/implanted within an area on which monitoring is to be done. Each of its sensor's node is connected to the base station so as to provide the latest and most updated information with their respective protocols. WSN are used in many fields which includes military, healthcare, environmental, biological, and other commercial systems. As we see this whole system relies on the electromagnetic waves which are superimposed by the data packets or the information bundles to do the job perfectly well.

On the other hand we see the exponential growth of cellular smart phones. Today the market is full of smart phones having different types of sensors in it like the magnetometer, gyro, barometer, air humidity, proximity, infrared, etc. and for their enhancements certain applications are also available like 'fishfinder' etc. Well this could be better for us to employ such technique so that we can gather large number of sets of information from each and every device. As we know that the number of observation is directly proportional to the accuracy of prediction of the result for any of the given test. So in this paper I want present an idea for employing this technique to reduce the capital investment in deployment of sensors. This would be beneficial as the cellular phones provide the mobility and covers the wider range of collecting the information.

The whole procedure in implanting the sensors with in an area consumes time, requires the maintenance and the most important issue is of supply of the power source. For quick action during military operations it becomes very hard to do so.

This deployment of technology revoking the sensors into the cellular phones can be done by various means. One of the common way is applying the BOTNET in cellular phones as it is done in making in the computer networks. A botnet is a number of internet-connected computers communicating with other similar machines in which components located on networked computers communicate and coordinate their actions by command and control(C&C) or by passing messages to one another(P2P or simply peer to peer). The word botnet is a combination of the words robot and network. Their most common use is in the field of Distributed computing. A distributed system is a software system in which components located on a networked computers communicate and coordinate their action by passing messages. The components interact with each other in order to achieve a common goal. Three significant characteristics of distributed systems are: concurrency of components, lack of global clock and independent failure of components. Here we should care about command and control as the commanding authority is the base station only.

Now we have to understand the signal blocking devices, commonly known as the signal Jammers which are placed into a region so that the devices would not be able to receive the signal from their base stations.

Applying the above techniques all over the platform of ai's field of Machine learning will enhance the outcome of the device. The script should be capable optimising the output at each and every node.

## 2. Deployment

Suppose we put a signal blocking device (jammer) in a particular place so that it blocks the signals received by the near mobile devices.

Now we send a flash message which gives the permission/key to bypass the network restriction. But the condition for bypassing the network restriction is only accessed when the user allows the flash message to install a few scripts, which runs on the backend of the device. The script should be platform independent i.e. hence there should be no issue that whether the individual is using android or he/she is using Symbian operating system.

On the other case if the user denies the request for installation then the whole process occurs by the brute-force method. As this process is done strictly for the military purposes so no boundaries should be there for the security operations.

Now after the installation of the whole script either by the grant permission of the user or by the brute force method, the process runs in the back end of the device. When the phone is connected to the internet it sends the data packets of information to the base stations. the mobile device collects the data by revoking the sensors of the devices. Now this data may vary from region to region and from devices to devices. And we get the accurate data from different locations in more refined format.

As this will increase the set of input data from the various parts of different data because the system is not stationary. This happens only by making the mobiles as the sensor nodes. Hence the whole system is considered as the advancement in the wireless sensor network. The main advantage of this type of system is, the implanting authority should not take care of the maintenance of each and every sensor node (here mobiles) hence reduction in cost of maintenance, issue to power supply is also been tackled by implanting so, and many other problems gets solved.

Due to the mobility of the network, the range of collecting and gathering data also increases. Deploying this method will certainly increase the accuracy of the results. Since the whole system is based on command and control (C&C) so there should not be any possibility for threatening and doing illegal and offensive crime. The responsibility for doing manipulations is only on the establishing authority and any interruption will be noticed at the base station.

The given figure explains the pictorial representation of the arrangement of the system.

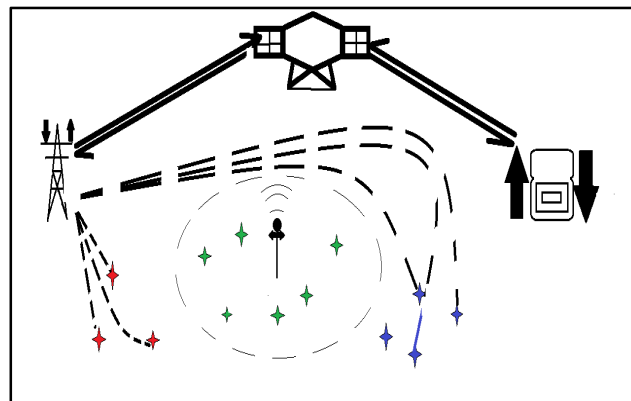


Figure 1

Here the red nodes denotes the mobile devices in which the script has not been installed and the green nodes denotes that the script has been installed and present within the region of the signal blocking device, here jammer, and the blue nodes denotes the nodes which are outside the network restriction area and the script has been installed. The tower is connected to the satellite which further transfer the data captured from each nodes to the base station by using telecommunication channel.

All nodes present outside the network restricted area are in direct communication media whereas in the network restricted area the signals are jammed by the jammer and one can only get credentials after installing such a script, which runs in backend of the device. After the installation of the script the whole system works along with the process. Now the sensors of the devices are revoked by the base station via telecommunication medium and transmit the current and latest value and update the result with more accurate and significant manner.

### 2.1. Goals of the System

Basically our objective is to make our system in such a way that it creates no burden on the channel and run smoothly. It can be understood in two levels at application based level and network based level. We summarise the whole in the points mentioned below:

- In designing the script we should aware of its size. Its space and time complexity should be low and most efficient.
- One of the major objective is to improve or optimize the performance of the entire network in terms of energy-conservation and network lifetime. Most of the research activities focus on the design of efficient routing protocol at the network layer selection of low-power modulation scheme at the physical layer or adoption of power-saving modal of operation at data link layer to achieve energy-awareness in WSNs. However, there is a noticeable trend that machine learning techniques have been applied to explore energy-aware communication in the application.
- The application should send the most optimum results so as to reduce low data consumption in sending the packets.
- The device's application should aware of any type of intrusion, and blocks the malfunctioning process.

- The application is capable of sending the alerts during emergency circumstances.

### 3. Advantages

The deployment of whole system doesn't require any special broadcasting channel or a bandwidth it just runs on the same as the telecommunication. Hence we are not bothering of implanting new channel medium. As the script to be installed on the device is platform independent so we should also not take care of modifying it according to the variety of the mobile devices. The whole system runs on wireless media to there will be no impact on physical impact unless any change directly occurs on the telecommunication media. The application is also capable of sensing the bad circumstances to send alert signals to the base station.

There will be no extra maintenance charges applied on the whole system as the nodes are present in the hands of the users. The employment of this system does not take much more time and covers the maximum area. The nodes are not stationary, they are movable. It means that the information gathered or collected by these node are according to its location and hence more accurate.

The purpose of this system is to deploy the sensor nodes very quickly and get their response within short interval of time from the nodes located at different random positions in the surveillance area. The most optimum output from each and every device will give the overall accurate result to the particular area.

From supervised learning we know that the best outcome depends upon the number of training sets so by gathering the amount of data sets from each and every node we have much larger data set.

### 4. Future Scope

The field of machine learning is very vast and increasing its fences in almost every phases of advanced intelligent systems. Currently, researches mainly focus on applying machine learning techniques to solve a particular problem in wireless sensor networks. But this paper is represents in making the use of sensors of mobile sources connected in a private network and making them as the node and gathers the information from different distributed sources. This may be called as the advancement in the wireless sensor networks. Moreover the use of this technology enhances the quick deployment of the sensor nodes within the surveillance area.

The system is not restricted to the telecommunication channel but further it can be extended and join the all personal and private networks from different sites to share the information throughout the globe. It can be used to stop the cybercrime and prepares us to tackle many hazardous calamities.

Since the network is a common portal so tracking will be much easier and hence any malfunctioning node or any intrusion will be noticed and will be solved within short interval of time.

### 5. Conclusion

Seeking the advantage of pre-existing signals and radiations in our atmosphere to create a network which gives additional information regarding the surroundings from that respective area more precisely. This paper illustrates just an idea of using telecommunication channel to create a wireless sensor network. There are many other channels or medium around us which can be used as way of gathering information. Using the platform of artificial intelligence we can manipulate our devices and make them more efficient in understanding the better results.

### 6. References

- i. R. G. C. Intanagonwiwat, and D. Estrin, "Directed Diffusion: A Scalable and Robust Communication Paradigm for Sensor Networks," presented at ACM MobiCom, Boston, MA, 2000.
- ii. A. C. W. R. Heinzelman, and H. Balakrishnan, "Energy-Efficient Communication Protocol for Wireless Microsensor Networks," presented at IEEE Proc. Hawaii Int'l. Conf. Sys. Sci., 2000.
- iii. K. Sohrabi et al., "Protocols for Self-Organization of a Wireless Sensor Network," presented at IEEE Pers. Commun., 2000, Oct.
- iv. I. E. C. Chien, and C. McConaghy, "Low-Power Direct-Sequence Spread-Spectrum Modem Architecture for Distributed Wireless Sensor Networks," presented at ISLPED Huntington Beach, CA, 2001.
- v. A. S. a. A. Chandrakasan, "Dynamic Power Management in Wireless Sensor Networks," presented at IEEE Design Test Comp, 2001.
- vi. Ma Di and Er Meng Joo, "A Survey of Machine Learning in Wireless Sensor Networks" presented at IEEE, 2007.
- vii. Shehar Bano, "A Study of Botnets: Systemization of Knowledge and Correlation-based Detection" October 2012.
- viii. Mohammad Abu Alsheikh, Shaowei Lin, Dusit Niyato and Hwee-Pink Tan, "Machine Learning in Wireless Sensor Networks: Algorithms, Strategies, and Applications" March 2015