"A Secure Web Server For Agriculture With Monitoring And Interrogation By The SMS Feedback"

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Abstract— Wireless sensor networks consist of small devices that contain severe resource constraints in terms of energy, processing power and memory that small devices are called as sensors. These wireless sensors are used in monitored area such as civilian area, military zone, agriculture, home automation, etc. which capture the constraints related to monitored phenomenon such as temperature, wind speed and soil and air humidity. The wireless sensor nodes are apply in this area that sends these monitored data through a multi hope routing to the sink node which transfer these phenomenon to the base station server, so that the server manipulated that data and used for decision making. In routing protocol used for the energy consumption and fault tolerance considered but in our approach we design to introduce the security and interrogation of monitored phenomenon. We capture the data related from agriculture and send this data to the secure web, the web server monitored that data and sends the feedback to the users in the form of text and voice SMS in their respected language.

Keywords— WS, WSN, Sapi, TTS,Zigbee transmitter, Zigbee Receiver,API.

Introduction:

A sensor node, also known as a mote, is a node in a wireless sensor network that is capable of performing some processing, gathering sensory information and communicating with other connected nodes in the network. A mote is a node but a node is not always a mote. In this approach today due to the diversity of climatic conditions agricultural have to face many problems. So our approach is based on an real time values that offers a synthesis of the services by using the Wireless Sensor Networks. The Wireless sensor networks are used to monitor the measurements related to the agriculture such as temperature, air humidity, soil humidity and wind speed. A multi-hop routing is used to send these monitored measurements to sink nodes. A large number of small sensing self-powered nodes which gather information or detect special events and communicate in a wireless fashion, with the end goal of handing their processed data to a base station are the Wireless Sensor Networks. Wireless Sensor Networks are the combination of sensing, processing and communication and which gives rise to a vast number of applications. Possible applications of sensor networks are in the most diverse fields. And they are used in environmental monitoring, warfare, child education, surveillance, micro-surgery, and agriculture are only a few examples.

Now a day's today and due to the diversity of climatic conditions and the large use of an Internet toward the many things [4], the objectives are moving forward to prevent the agriculture. This makes the data capture by sensors accessible by server manager and the farmers. Furthermore, the applications may have heterogeneous and distant characteristics .In this approach, we have designed a platform based on Web Services and synthesizers [4] that offers interfaces for interrogating and managing WSN. Our approach is based on an application gateway that offers a use of the services offered by the Wireless Sensor Networks and web Service. The platform access by users and these applications are interrogated and managed by the WSN in a secure fashion to provide the services to the farmers.

In our approach we offers a set of Web Services for farmers and these services give access to interrogate the Wireless Sensor Node ("What is the temperature of my agriculture"), for how to manage the Wireless Sensor Node (" What to do for my agriculture if any one factor affects from atmospheric climate"), if we want any notification in case of event in agriculture ("Send the measurements to the WSN if the changes occurs in agriculture"), if any sensor fails then send the report to the server to replace that sensor by another sensor, if there are number of seeds to be sown in agriculture "Add number of seeds to the server and peoples will make the use of that list, "Add the authorized peoples to see what is the temperature, humidity and wind speed in agriculture".

The Wireless sensor networks are used to monitor the measurements related to the agriculture such as temperature, air humidity , soil humidity and wind speed. Here we used the different sensors for measuring the phenomenon related to agriculture for temperature the Ballas semiconductor 1612 sensor,for air and soil humidity Lm 324 Sensor and for wind flow TSOP 1738 sensor. In this approach we used a multi-hop routing to send these monitored measurements to a sink nodes.For this purpose we use the zigbee module for the security of transferring of the data at receiver and transmitter sides.Then these sink node transfers the data to the Base Station (BS) means at the server side. For storing the captured data from sink node to base station we use the file structuring algorithm. The Base station stores phenomenon from sink nodes which are placed at agriculture and forward it to the online Server and at server side the monitored data are compare with the research data by using the aggregation algorithm.

We designed a approach where there are total three phases ,the first one is an application where the research data will be taken from the research centre and stores that data at server side by the file structuring algorithm, we use the wireless sensor at the agriculture to capture the data such as temperature, soil and air humidity and wind speed. In second phase the capture data is compared with stored research data by using the aggregation algorithm and data comparison algorithm. In third we sends the suggestions to farmer for the good harvesting of crop to produce the profit in the agriculture .

RELATED WORKS

In previous approach only the issue of interconnection between WSN with the server was found. We classified them into three categories. First we have those which gives the gateway between the WSN and the server(Internet). In fact, the idea of application level gateways for the interfacing between WSN at application gateway and server at base station have been used in [5] and [6]. The Ahmed Amokrane, YacineChallal, Amar Balla "A Secure Web Service-based Platform for Wireless Sensor Network Management and Interrogation" [1] explain the approach which is based on Web Services implemented by a gateway and the server. The usage of Web Services provides opportunities to the fact that they are standardized and widely used by Internet today. The offered services are augmented by Authentication, Authorization and Accounting (AAA) functionalities to insure filtering clients and requests at the Gateway level as well as a billing system for WSN. The S.Rajagopal ,T.Senthil [2]suggest the model builds a standardized interface between a WSN and external IP network. Designed gateway that offers a synthesis of web services offers by the WSN assuring its entire management IT is applicable in several areas of our lives, including environment and habitat monitoring, healthcare applications, home automation, and traffic control. Windong Wang [3] Provides a novel method to access ZigBee based wireless sensor networks (WSN) from the Internet using web service approach.We designed a novel gateway between the WSN and the Internet mainly for the scenario of home and building automation. With the improvement of the traditional gateway, the users on the Internet can access the data of the sensor networks. The "Script to speech conversion for Hindi language by using artificial neural network "[4] in this paper represents the technique for converting the text written in Hindi language into speech by using artificial neural network. Text to speech conversion software can have many applications in day to day life. It can be useful for blind people to read the document. It is useful in giving education to the students by listening what is written in books. If someone doesn't have time to read emails, he can listen the contents of email while doing other work. The document containing Hindi text is scanned and given as an input to the system, it is considered as an image. Then preprocessing is done for the document to obtained clear image. In this system neural network is used for character recognition, so the system can be enhanced to work with letters written in different style or fonts. After the letters in the document are successfully identified by neural network, the text in the document is converted into speech.The access to communication technologies has become essential for the handicapped people[8]. This study introduces the initial step of an automatic translation system able to translate visual speech used by deaf individuals to text, or auditory speech. A such a system would enable deaf users to communicate with each other and with normal-hearing people through telephone networks or through Internet by only using telephone devices equipped with simple cameras. In particular, this paper introduces automatic recognition and conversion to text of Cued Speech for French. Cued speech is a visual mode used for communication in the deaf society. Using hand shapes placed in different positions near the face as a complement to lipreading, all the sounds of a spoken language can be visually distinguished and perceived. Experimental results show high recognition rates for both isolated word and continuous phoneme recognition experiments in Cued Speech for French.

3. PROPOSED WORK

Few works addressed the issue of interconnection between WSN with the server. We classified them into four modules. The first one is, we provide the gateway between the WSN and the server(Internet). But the server is at built first and after that the interfacing will be done. In this we use the WSN to capture the data related with the agriculture. As we provide the gateway between the WSN and Server, the WSN transfers this captured data to the server for monitoration and for interrogation. n fact, the idea of using application level gateways for the interfacing between WSN at application gateway and server at base station have been used in [5] and [6]. So the connection between the gateways and Internet using GPRS have been introduced in [7].

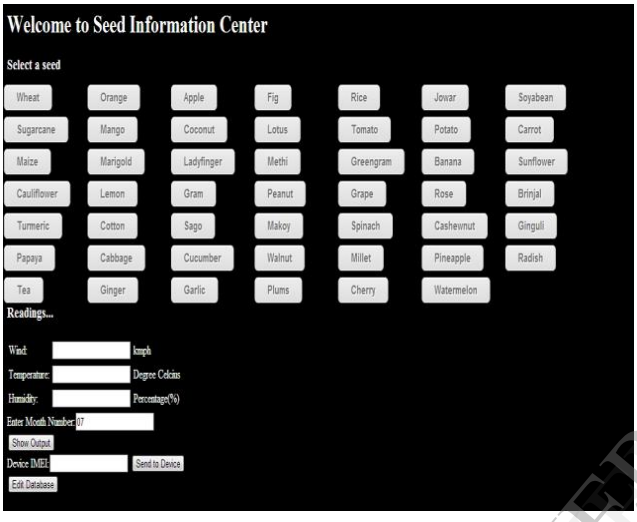
1. First phase: creating database for the research data and detecting the real time data
2. Second phase: aggregation of the data and creation of the graph.
3. Third phase: find out instructions and send through the text and voice SMS.

1. First phase: creating database for the research data and detecting the real time data

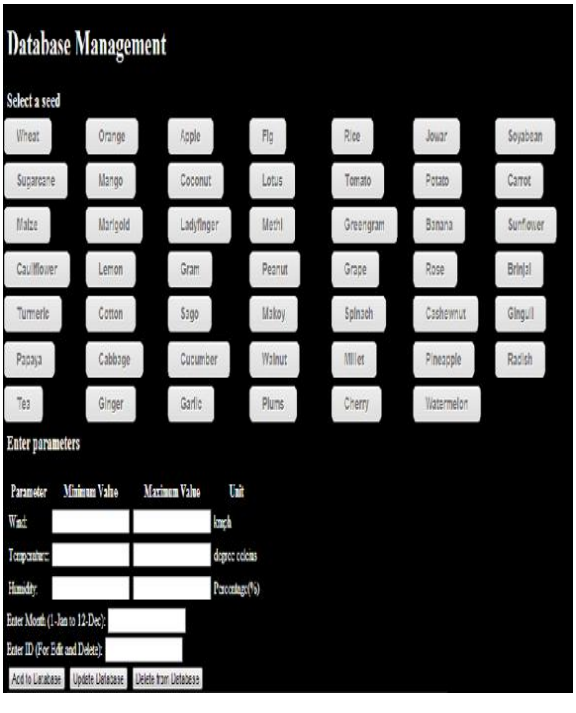
In this use case, the sensors are deployed in a monitored area (agriculture...) to capture data related to

temperature and air and soil humidity and also wind speed. They can answer requests for real time data like temperature and air and soil humidity and also wind speed. Approximately they can detect the loss in crops but the accuracy is given by calculating the exact values which are suitable for the agriculture for instance. It uses Directed Diffusion [2] as a routing protocol. Ballas semiconductor 1612 sensors are used to monitored the Temperature of the agriculture, Lm 324 Sensors are used to measure the soil and air humidity and TSOP 1738 sensors are used to measure the wind speed.

Here we are using the file structure algorithm to store the data into the database. We have taken the three sensor nodes for the different seeds to store the database such as wind speed minimum and maximum, temperature minimum and maximum and humidity minimum and maximum. And respective of that phenomenon we store the instructions that are useful for farmers to take the appropriate action. We apply the sensor nodes at the agriculture and which captures the data related to agriculture and sends that data to the sink nodes and that data stored into the database. We can modify, delete or can store new data into the database.

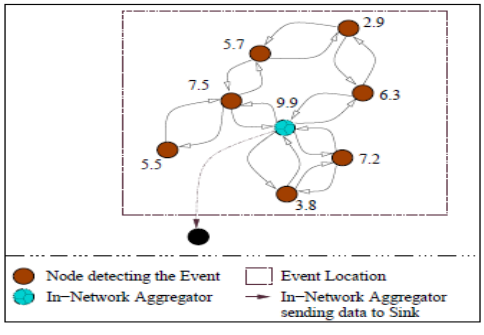


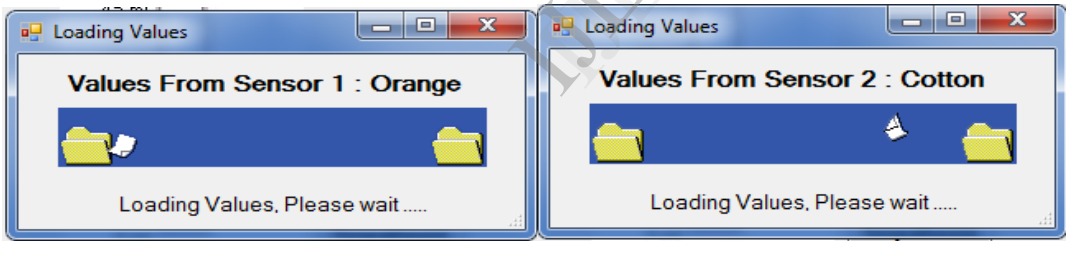
2. Second phase: aggregation of the data and creation of the graph.

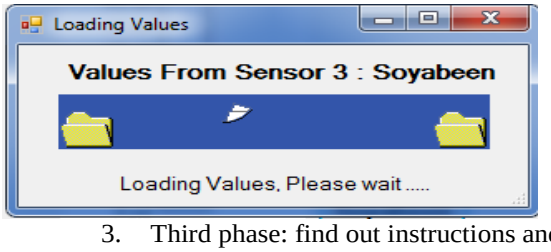


Data-aggregation techniques in wireless sensor networks

Data gathering is defined as the systematic collection of sensed data from multiple sensors to be eventually transmitted to the base station for processing. Since sensor nodes are energy constrained, it is inefficient for all the sensors to transmit the data directly to the base station. Data generated from neighboring sensors is often redundant and highly correlated. In addition, the amount of data generated in large sensor networks is usually enormous for the base station to process. Hence, we need methods for combining data into high-quality information at the sensors or intermediate nodes which can reduce the number of packets transmitted to the base station resulting in conservation of energy and bandwidth. This can be accomplished by data aggregation. Data aggregation is defined as the process of aggregating the data from multiple sensors to eliminate redundant transmission and provide fused information to the base station [2]. Data aggregation usually involves the fusion of data from multiple sensors at intermediate nodes and transmission of the aggregated data to the base station (sink) so we can conclude that data gathering is to collect the data from neighbor node to be sent to sink and data aggregation is process of removing redundancy among them. Data aggregation can be categorized on the basis of network topology, network flow, quality of services and many more. In this paper we have put our attention on network topology based data aggregation technique as shown in figure. We can divide the data aggregation technique into parts: structure based and structure free. Structure based data aggregation can be further divided into four parts flat network based, cluster based, tree based and grid based.







3. Third phase: find out instructions and send through the text and voice SMS.

The sensors are deployed in agriculture fields to capture data related to temperature and humidity in air and soil. They can answer requests for real time data and detect events like fires and dryness which are harmful to the agriculture. Again the accuracy is found as we use the WSN for capturing the real time values. Then according the output of aggregation and sort algorithm we get the actual values required for the agriculture and hence on the basis of that we send s the voice sms in their different languages.

For both of the two use cases, the Gateway has been

However, this approach , in similar to our framework, but don't use SAPI for introducing the voice SMS . The second represents the arrgegation of data by using the aggregation algorithm. The third module give the comparison between the actual value and the real time values and form the text messages which are

beneficial for agriculture And in last one we will use the SAPI algorithm to convert the text messages into the voice SMS and sends that SMS in the form of voice SMS to the different users in the mother tongue.

We have given a global overview and detailed which work on the real time value. Furthermore, it was thought to be generic, not limited to some applications but in this approach we only consider the agriculture concept Then, we instantiated it into four use cases to provide a proof of concept. It is the first routing protocol in this new paradigm for WSN and the results obtained are promising.

The sms feedback system make it more secured services. In general, there are two ways to send SMS messages from a computer / PC to a mobile phone:

4. Connect a mobile phone or GSM/GPRS modem to a computer / PC. Then use the computer / PC and AT commands to instruct the mobile phone or GSM/GPRS modem to send SMS messages. But here we use the IDEA algorithm for the authentication purpose.
5. Connect the computer / PC to the SMS center (SMSC) or SMS gateway of a wireless carrier or SMS service provider. Then send SMS messages using a protocol / interface supported by the SMSC or SMS gateway. But here we use the IDEA algorithm for the authentication purpose.

The major problem with the listed works is the fact that they are either tightly related to applications or they introduce proprietary languages and communication protocols. Furthermore, the efforts toward generic approaches are sometimes neglected. However, the generic approach will be proposed. The Existing system of web server consists of only static verification but in this approach we deals with the real values of the monitored phenomenon.. We are proving a dynamic verification by using SMS feedback. Once the feedback by user is accepted on this basis we can proposed a dynamic verification system in which at the one time we will get the authentication of valid user. The user also get the feedback in the form of voice SMS.

DES (the Data Encryption Standard) is a symmetric block cipher developed by IBM. The algorithm uses a 56-bit key to encipher/decipher a 64-bit block of data. The key is always presented as a 64-bit block, every 8th bit of which is ignored. However, it is usual to set each 8th bit so that each group of 8 bits has an odd number of bits set to 1.

The algorithm is best suited to implementation in hardware, probably to discourage implementations in software, which tend to be slow by comparison. However, modern computers are so fast that satisfactory software implementations are readily available. DES is the most widely used symmetric algorithm in the world, despite claims that the key length is too short. Ever since DES was first announced, controversy has raged about whether 56 bits is long enough to guarantee security. The key length argument goes like this. Assuming that the only feasible attack on DES is to try each key in turn until the right one is found, then 1,000,000 machines each capable of testing 1,000,000 keys per second would find (on average) one key every 12 hours. Most reasonable people might find this rather comforting and a good measure of the strength of the algorithm. Those who consider the exhaustive key-search attack to be a real possibility (and to be fair the technology to do such a search is becoming a reality) can overcome the problem by using double or triple length keys. In fact, double length keys have been recommended for the financial industry for many years.

Use of multiple length keys leads us to the Triple-DES algorithm, in which DES is applied three times. If we consider a triple length key to consist of three 56-bit keys K1, K2, K3 then encryption is as follows:

- Encrypt with K1
- Decrypt with K2
- Encrypt with K3

Decryption is the reverse process:

- Decrypt with K3
- Encrypt with K2
- Decrypt with K1

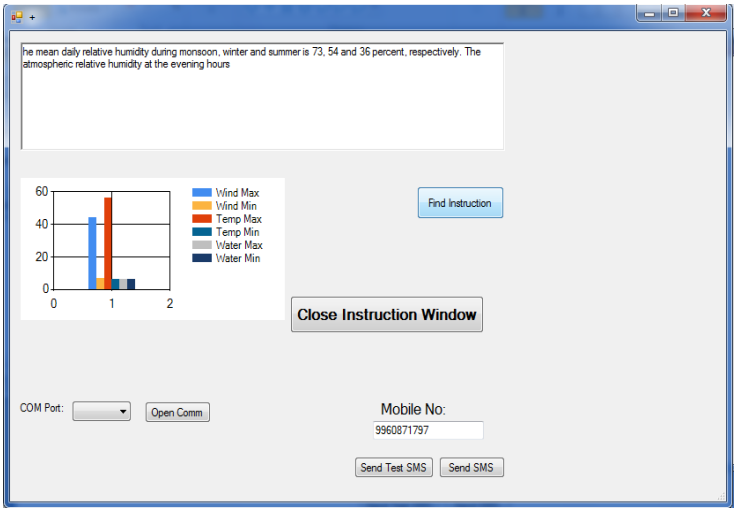
Setting K3 equal to K1 in these processes gives us a double length key K1, K2.
Setting K1, K2 and K3 all equal to K has the same effect as using a single-length (56-bit key). Thus it is possible for a system using triple-DES to be compatible with a system using single-DES.
Triple DES uses a "key bundle" which comprises three DES keys, K_1, K_2 and K_3, each of 56 bits (excluding parity bits). The encryption algorithm is:

$$\text{ciphertext} = E_{K3}(D_{K2}(E_{K1}(\text{plaintext})))$$

I.e., DES encrypt with K_1, DES *decrypt* with K_2, then DES encrypt with K_3.
Decryption is the reverse:

$$\text{plaintext} = D_{K1}(E_{K2}(D_{K3}(\text{ciphertext})))$$

I.e., decrypt with K_3, *encrypt* with K_2, then decrypt with K_1.
Each triple encryption encrypts one block of 64 bits of data.
In each case the middle operation is the reverse of the first and last. This improves the strength of the algorithm when using keying option 2, and provides backward compatibility with DES with keying option 3.



4.CONCLUSION

We have given an architecture that integrates the WSN in IP networks, through the gateway which is the interconnection between the WSN and the server mainly at base station and the sensor nodes at the agriculture. Our approach is based on Web Server implemented in a gateway at server side which is mainly used for the agriculture. The Web Services are used for the monitored area that provides opportunities due to the fact that they are standardized and widely used in internet today for providing actual measurements of the agriculture by which we can give the suggestions to the farmers .We have given the detailed design of our framework in total three modules. We have seen that the interoperability is always insured through the different farmers and users which are useful to the clients. Hence the web secure server gives the suggestion about the agriculture in the form of text and voice SMS which are send by server on response or any change in the condition.

5. REFERENCES

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