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A PATH FOR HORIZING YOUR INNOVATIVE WORK

HOME AUTOMATION AND SECURITY USING JAVA

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Abstract: The home automation today make use of the latest technologies. In this paper, we present the design and implementation of a home automation system and security using various technologies like GSM , Internet, and speech recognition.. All these techniques are successfully merged in a single home automation system. This system contributes to low cost, powerful and user friendly way of real-time monitoring and atomizing the home.

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INTRODUCTION

The Idea of automation has been implemented for some years. It began with the concept which is the combination of computer application and robot technology. In other words, it is the control of devices and appliances by means of a computer or from remote devices. Then the concept is developed to a recent technology and interaction of technologies and services applied to different system. Different areas where automation can be applied are Industry, Home ,car etc.

Home automation and Security services systems are integrated in many homes and buildings to meet the needs of todays customer. On the other hand, mobile devices such as handheld devices and smart phones are providing location-independent access to the Internet and local networks. The home automation refers to domestic environment that improves the quality of the resident's life by a, healthy, and safe environment which is not a complex . Now-a-days security has been a major issue where crime is increasing and everyone wants to take proper measures to prevent intrusions. As the integrated circuits and microprocessors become more and more accessible and the Internet communication is a fact of today with the improved availability of GSM networks, these enhancement naturally should find use in modern home automation systems.

Designing a home automation system for monitoring and controlling various devices in remote locations can be done through a variety of communication options such as wireless LAN , modems, radio networks, satellite , Web pages , GSM and so on. Several types of research have been done using different types of control methods. Mobile communication and home automation technologies are mature and adequate devices capable and available. The next logical step is to combine the mobile world with the technology of one's own home to control most home appliances and systems en route wherever you are. In addition, home automation systems, such as HVAC (heating, ventilation, and cooling), lighting, anti-crime, and fire-detection systems are being used to improve convenience and safety for occupants.

Generally, in a conventional home automation system,home equipments, such as switches, valves, or fire detectors, are directly connected to controllers for the HAVC or fire-detection systems. However, because of the analog transmission method, which uses a, conventional fire-detection systems detect a fire as occurring when the current received from a fire detector exceeds a predefined threshold. Hence, the system has disadvantages such as a weakness to noise of various forms, including impulses or short-circuits, and a lack of awareness of the actual location of a fire.

The home automation system is an integrated hardware module consists of two main components; the central processing unit, which uses microcontroller. Beside this microcontroller, there are several other parameters where control of home automation can be done with other technologies such as Bluetooth based ,WIFI based ,Zigbee based and standard is maintained where today smart phone user can easily access it .today smart phones are providing major applications which can be easily integrated with technologies to make home a smart home.

Atomizing the home is a need but security to that home is major factor that is to be taken into consideration .The security features which can be controlled and monitored with help of mobile and internet plays a impact role in developing a advanced home automation system .this advanced home automation system can be made user friendly with help of GUI which can be developed with different software .Home automation adds luxury to ones life it can enhances communication between people in society.

II. System Architecture

The proposed system uses Three technology to enable user of remotely monitoring, and controlling his home automation system. In this model we proposed three methods of home appliances control which are via;

• GSM (mobile with J2ME)

• Internet (website)

• Speech (SAPI)

The first method is to be designed for the users when they would like to remotely access the devices in the house with mobile phone(J2ME application)and will get status update

The second method is to be designed with help of website where they would like to access the devices and view the location with help of camera and controlled the necessary parameters by making required setting and maintain the database.

The third one is designed for the users while they are inside the house for controlling the devices with help of speech ie (SAPI) Techniques. The main objectives of the proposed system is to design and to implement a cheap and open source home automation system that is capable of controlling and automating most of the house appliances through an easy manageable way to run and maintain the secured home automation system required.

The proposed system uses SMS service provided by GSM network to enable user of remotely monitoring, and, controlling his home automation system. where the client mobile has J2ME application which will remotely monitor and control the house and second one with help of internet through website which will monitor and control and setting can be done and third one is that of speech where person in house will operate or control his appliances with help of speech

Temperature of room.

Humidity of room.

Camera surveillance for movement detection

Door locks control system.

Status of the Door

Database of the Door operation

Door bell system

Authentication to person with help of images .

Light intensity and Fan speed and curtain opening and closing.

Gas cylinder valve (regulator) control with help of camera.

Freeze, Microwave, etc turn on and off.

III System Diagram

Fig: system Diagram

Fig: Laser security

Today's mobile phones have more processing power, color screen, and are capable of running external applications developed by users. These capabilities make mobile phone an ideal platform for providing an excellent user interface. A Java-enabled mobile phone is chosen in our design due to the portability of Java and the fast increasing popularity of Java-enabled mobiles. The portability of Java ensures that applications developed in Java language are portable across different mobiles from different manufacturers. Since Java has a rich library of application program interfaces (API) providing functions such as GUI , sending and receiving messages, and communicating via GPRS, etc., Java applications for mobile phones can be easily developed by using Java development tools commonly known as development environment. In addition, most mobile phone manufactures provide their respective handset emulators for developers to test their applications on before testing on real phones.

This makes programming simple as there are API's for a lot, of functions you may want to implement. One such API that was used within this project was the 'form' API which enables elements to be added in order to create a generic application that has the same elements that can be used on any J2ME cellular phone.

Internet

In order to achieve interaction with the home automation network from the outside, the use of internet can be with home automation with help of home automation server .The home automation server can be created as database where all the history and status of home devices can be viewed with help of webpage. The webpage is created in ASP.net.

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VB.NET

Done. with the help of internet user can interact Visual basic .net is basically framework used for developing desktop application .windows application ,it's a framework developed by Microsoft where the basic application form can be designed using visual basic concept.

ASP.NET:

ASP.net is fastest, efficient, reliable and best supported way to create interactive web applications available today. Integrated with the development tools available from Microsoft, it is incredibly easy to create websites that looks great and performs well.

Speech Application Programming Interfaces (SAPI)

A speech recognition program is written to control the house by means of human voice. we found that the Dynamic Time Warping (DTW) algorithm. This algorithm is implemented in MATLAB but to reduce complexity we are implementing on SAPI.

The Speech Application Programming Interface or SAPI is an API developed by Microsoft to allow the use of speech recognition and speech synthesis within Windows applications. Speech API can be viewed as an interface or piece of middleware which sits between applications and speech engines (recognized).

The current project of speech operated is through speech recognition through matlab is tedious one which will be overcome by SAPI in our project.

Shared Recognizer: For desktop speech recognition , a recognizer can be used which runs in a separate process . All applications using the shared recognizer communicate with this instance. This access sharing of resources, removes contention for the microphone and allows for a global UI for control of all speech applications.

In-procrecognizer.: For applications that require explicit control of the recognition process the in-proc recognizer object can be used instead of the shared one.

Grammar objects: Speech grammars are used to specify the words that it is recognized. SAPI defines an XML markup for defining grammar for speech in code. Methods also exist for instructing the recognizer to load a built-in dictation language model. Voice object. This performs speech synthesis, producing an audio stream from text. A markup language can be used for controlling the synthesis process.

Audio interfaces: The runtime includes objects for performing speech input from the microphone or speech output to speakers (or any sound device) from wave files. It is also possible to write a custom audio object to stream audio to or from a non-standard location.

IV EXPERIMENT RESULT

The mobile application is being developed in J2ME platform where the appliances to be controlled and monitoring of overall devices can be design. with help of user friendly GUI. These GUI can be developed in NETBEANS IDE where the IDE provide s necessary parameters to be included in the mobile application.

The temperature and humidity sensor is interface to sense the temperature and control the temperature of home automation and status of temperature is send mobile phone where it can be controlled using specified action. Humdity of home can be controlled using this sensor techniques.

The Advanced features in this model is the door bell system when the door bell ring the camera on the door takes snapshot of the visitor send to owner mobile on the basis of that snapshot the owner can authenticate the visitor and open the door. cooking gas cylinder can be controlled by using kiddle gas valve which can change the operation of gas valve or make it on or off. The turning on or off of gas valve is done with help of LPG gas sensor.

The Desktop and web application is being developed in VB.net and ASP.net framework where a desktop application gives overall status of home appliances and can be control by one click .and web application provide the web page where live video of particular home can be viewed .the web page can provide a user account. The advanced features which is added is security of home with laser security where the laser beam is send help of laser torch and LDR is used to detect obstacle .

The major contribution where live video of home automation can be viewed through mobile. This project will increase flexibility, security, cost effectiveness and will be small in size in terms of product. This project will consume less power and will reduce complexity.

V CONCLUSION

The home automation which were developed previously were not upto mark where only appliances control i.e ON or OFF were given. this paper result shows the appliances automation and security with Overall control of home appliances using on and off monitoring status of appliances and maintaining database of appliances status and providing security using laser and

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webcam and monitoring of home with mobile through interactive screen and control devices which is will be cost effective for daily users

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