

SYSTEM OF AUTOMATION FOR SECURITY AND ELECTRICAL APPLAINCE CONTROL

Jagtap Tejashree A¹, Borade Shital S², Jadhav Supriya G³, Borule Nishani B⁴,
Asst Prof. Pooja Thakre⁵

^{1,2,3,4} Department of Computer Engineering, GSMCOE Balewadi, Pune(India)

⁵ Prof. Department of Computer Engineering, GSMCOE Balewadi, Pune(India)

ABSTRACT

In recent years, the home environment is having a rapid introduction of network enabled digital technology. This technology offers latest and exciting opportunities to increase the connectivity of devices within the home. In addition, with the rapid growth of the Internet, there is additional potential for the remote control and monitoring of such network enabled devices. This paper evaluates the potential of ZigBee for addressing the problems related to automation through the design and implementation of flexible home automation architecture. A home automation system and Wi-Fi network are integrated through a common home gateway. Home automation not only reduces human efforts but also refers to energy efficiency and time saving. The main objective of home automation and security is to enable handicapped and old aged people to control home appliances and alert them in critical situations. This paper implements the design of home automation and security system using Android ADK. The design is based on a embedded system board Android ADK (Accessory Development Kit) at home. Home appliances are connected to the ADK. A communication is established between the ADK and Android mobile phone or tablet. The home appliances are connected to the input/output ports of the embedded system board. The status of appliances is passed to the ADK. Our work extends by developing an authentication to the system which would allow only the authorized person to access home appliances. The device with low cost and scalability with the core is much important. It provides the design and implementation of automation system that can monitor and control home appliances through android phone or tablet from remote location.

Keywords— *Embedded Systems ,Android SDK ,Android mobile ;Tablet, Andruino BT Controller.*

I. INTRODUCTION

The smart home based on the Internet-of-Things (IoT) and other technologies provides people a living environment with security, convenience, comfort, environmental protection and intelligence. The proposed system works on real time monitoring , so that the electrical devices and switches can be remotely controlled and monitored with or without an android based app. Authentication & permission is the main concept for the security and rule perform permission level as well as time based performance things the due to this things are protected from the inaccessible user. It uses various sensors to not only monitor the real time device tracking but also maintaining the security of your house. Home automation is becoming a viable option for older adults and people with disabilities who would prefer to stay in the comfort of their homes rather than move to a healthcare facility. This field uses much of the same technology and equipment as home automation for security, entertainment, and energy conservation but tailors it towards older adults and people with disabilities.

1.1 PROBLEM STATEMENT

In proposed system overcome the all the unsupported things. This system is designed for security purpose, our system is based on the server system user can access the system anywhere from the worldwide. Permission level is achieved by hiding the things from the other user means only the authorized person can access all the things from the system also give the permission to the other user to access the system. Wifi module is used to connect the device to internet for accessing & responding the request from the web application or android apps.

1.2 OBJECTIVES

- Time related event setting can be achieved.
- Authentication level setting can be achieved.
- System is globally accessed.
- Improve the speed due to fast respond.

II. EXISTING SYSTEM

Home automation or smart home is the residential extension of building automation and involves the control and automation of lighting, heating (such as smart thermostats), ventilation, air conditioning (HVAC), and security, as well as home appliances such as washer/dryers, ovens or refrigerators/freezers that use WiFi for remote monitoring. Modern systems generally consist of switches and sensors connected to a central hub sometimes called a "gateway" from which the system is controlled with a user interface that is interacted either with a wall-mounted terminal, mobile phone software, tablet computer or a web interface, often but not always via internet cloud services.

The Internet-of-Things is the core infrastructure of smart home. We can collect the real-time state data of environment, devices and users using IoT. One of the key issues for the smart home service system is how to process real-time data from IoT layer rapidly and supply an initiative service with precision, individuation and intelligence. Smart home context-aware system based on rules which using XML language to mapping elements and services, Propose system used to integrate various services and devices rapidly to realize the association of devices and services. This paper proposes a smart home service framework based on event matching, which identify events through real-time data sensing and processing and supply an initiative service with precision, individuation and intelligence through event processing and inference.

III. PROPOSED SYSTEM

Proposed methods are implemented based on security & authentication for capturing many things. The future scope may fall to integrate the Quality of Context into computation to effectively characterize the user and physical environment towards a more effective decision as a computing service. The future work will focus on the key issues towards efficient and accurate decision support. The methods to accurately and comprehensively characterize the contextual situation with sensing techniques, efficiently generate the effective rules, and evaluation strategy for service customization and rule generation are central concerns in further investigation.

Biometric security is a security mechanism used to authenticate and provide access to a facility or system based on the automatic and instant verification of an individual's physical characteristics. Because biometric security evaluates an individual's bodily elements or biological data, it is the strongest and most fullproof physical security technique used for identity verification.

Biometric security is mainly implemented in environments with critical physical security requirements or that are highly prone to identity theft. Biometric security-based systems or engines store human body characteristics that do not change over an individual's lifetime. These include fingerprints, eye texture, voice, hand patterns and facial recognition.

An individual's body characteristics are pre-stored in a biometric security system or scanner, which may be accessed by authorized personnel. When an individual walks into a facility or tries to gain access to a system, the biometric scanner evaluates his/her physical characteristics, which are matched with stored records. If a match is located, the individual is granted access.

IV. IMPLEMENTATION

System that we have designed consist of a remote control device that sends orders wirelessly by the use of XBee transceivers and through the master board that receives the command signals and activates appliances by triggering the corresponding electronic relays to achieve the ON/OFF functionality. As mentioned before, the remote control consists of an LCD display for notification messages, many LEDs and the command buttons for the different appliances, wherein each button indicates a specific appliance. Based on a social point of view, buttons are suitable for the categories of users that are intended to use this system. However, buttons could be replaced by touch screen devices for individual that have an increase knowledge about it and is familiar with similar visual display screens. The master board is introduced into a wall position in such a way that it is ascertain to reach the target appliances. In fact, the remote control and the master board are communicating with each other to exchange information about which appliances are selected to be commutated (ON or OFF), as well as the status of the selected appliances sent backward from master board to the remote control in the form of text messages (SMS). The remote control device may be a mobile phone or a tablet. The XBee transceivers are picked out to ensure data exchange securely that is without interference and to be able to defeat against intruders and hackers. However, the XBee configuration phase required the knowledge of some specific id code that corresponds to certain security levels.

The functionality of the home automation system is specialized for old aged and people with disabilities. This can be summarized by the following steps:

- When a button of the particular specified appliance is pressed, an alert LED assigned to this appliance is illuminated and an alert message is shown on LCD. The remote control sends command signals to the master board, which need to know about the new orders.
- Then, the master board processes the received signal, and complete operation will be acquainted by the microcontroller about the corresponding appliance and the associated ports from which the signal to be triggered should be initiated.
- As the switching circuit is activated by the microcontroller signal, it will turn ON or OFF the appliance, corresponding to its previous status.

- Finally, the master board will broadcast the situation and the position of the appliances that are working and is to be displayed on the LCD of the remote control in a periodic elapsing time.

The entire system was built completely by using wooden home prototype. The home appliances are resembled by small fan and a group of lights. The software was tested to ensure that the program code doesn't include any bugs or errors and doesn't generate unexpected results. However the system hardware is designed and implemented properly. The demo of the system, validates design and shows that the complete operations are executed accurately.



Fig.3.1. System conceptual flow

V. SYSTEM APPLICATIONS

Following are the applications of Home Automation System:

- Medical alert
- Accurate and secure blind control.
- Detection of fire, water leaks and gas leaks.
- Smoke detector can detect a smoke or fire condition, that allow all lights in the house to blink so that any person of the house gets alert to the possible emergency condition.
- The system can call the home owner on their mobile phone to alert them, or directly contact the fire department or alarm monitoring company.
- In terms of lighting control, it is possible to save energy by auto on/off light at night time in all major city office buildings, say after 10pm when energy in both residential and commercial applications is wasted for hours.
- The potential for central locking of all perimeter doors and windows and also Control and integration of security systems. Security cameras can be controlled that allows the user to observe activity around a house or business accurately from a Monitor screen or touch panel.
- Motion sensors can also be included in security systems that will detect any kind of unauthorized movement and notify the user of the system, by the security system or via cell phone.
- An intercom system that allows communication by using a microphone and loud speaker between several rooms.

VI. HARDWARE & SOFTWARE COMPONENTS

6.1 SOFTWARE REQUIREMENT:

Front End

- Jdk 1.7.0
- Internet Explorer 6.0/above
- Tool : Net Beans 7.4

Back-End

- MySQL 5.1

6.2 HARDWARE REQUIREMENT:

- Processor:- Intel Pentium 4 or above
- Memory:- 512 MB or above
- Hard Disk:- 10gb
- Processor - Pentium III
- Speed - 1.1 Ghz
- RAM - 256 MB(min)
- Hard Disk - 20 GB
- Floppy Drive - 1.44 MB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

VII. CONCLUSION AND FUTURE SCOPE

8.1 CONCLUSION

This is an ongoing project. Our prime objective is to assist handicapped/old aged people. This paper gives basic idea of how to control various home appliances and provide a security using Android phone/tab. This project is based on Android and Arduino platform both of which are FOSS(Free Open Source Software). So the overall implementation cost is very cheap and it is affordable by a common person. Looking at the current scenario we have chosen Android platform so that most of the people can get benefit. The design consists of Android phone with home automation application, Arduino Mega ADK. User can interact with the android phone and send control signal to the Arduino ADK which in turn will control other embedded devices/sensors. We have discussed a simple prototype in this paper but in future it can be expanded to many other areas

8.2 FUTURE SCOPE

We can deploy a cross platform system on various platforms like iOS, Windows, looking at the recent situation. This work can be extended by removing the limitation of accessing only some devices to all other appliances in the house. User can observe the activity around the house or business by controlling Security Cameras. Security systems include motion sensors that can detect the unauthorized movement and send a notification to the user about the same. Scope of this project can be expanded widely to many areas by avoiding its restriction only at

home. Various wired as well as wireless technologies like Bluetooth, world wide web can be allowed to support the system to make it more flexible.

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