Volume 6, Issue 2, February 2016 ISSN: 2277 128X
International Journal of Advanced Research in Computer Science and Software Engineering
Research Paper
Available online at: www.ijarcsse.com

Automated Door Control System Using Android Phone and GSM Modem

[1]Sneha Sahare, [2]Ankita Bagade, [3]Ketki Gomase, [4]Ankita Darbeshwar, [5]Arti Awate
[1]Assistant Professor
[1, 2, 3, 4, 5] Computer Science and Engineering, Dr. Babasaheb Ambedkar College of Engineering and Research, Nagpur, Maharashtra, India

Abstract - The advancement in the field of computer science and boom of electronic gadgets and smart phones in the market since past decade have generated necessity of developing more advance devices. Due to the fast lifestyle it is also necessary to invent highly advanced devices for smart home. The home controller connected to the windows based PC are popular these days. In our research we presented a smart technology for automation of opening and closing the door using android based smart phones and GSM modem. The proposed system consist of three parts the Server, where the web service is hosted. Second part is hardware interface module which provide appropriate interface to the actuator, IP camera, server, and GSM modem. And the third part is of mobile having android application which facilitates opening and closing of door and viewing video of the visitor. The proposed system uses Wi-Fi technology as a network infrastructure connecting various parts.

Keywords--- Android, GSM modem, Controller, IP Camera, Door automation.

I. INTRODUCTION

The wireless automation applications that can be implemented without any changes in the existing infrastructure can be installed easily. It lets the user to control the appliances from smart phone. In the android application the user can select actions which should happen with the appliances in the network. Today most of the mobile phone users use smart phone which offers various application and more advanced capabilities in connectivity issues than the regular phones. Smart phone usually support multiple tasks at a time and also short arrange wireless technologies such as sharing apps. Smartphone can provide computer mobility, data access and intelligence for every aspect of daily lives. Smart phones actually have ability to make life easier.

Door control technology is a technology using which various apparatus converse over a local area network. Smart door is combination of technology and services through the home networking for better and convenient living. It makes automatic connection with the environment via Wi-Fi.

Disabled people are more likely to be exposed to the daily life problem than the normal once. With the help of technology we can develop appliances to overcome these problems. The system can allow the user to control features or automate them. In our proposed system we have developed door automation so that it can be convenient for a disabled or old people to open or close it by viewing the video of captured by IP camera from any were in the house. We can even manage opening and closing of the door even if we are out of the Wi-Fi range through short message using GSM modem.

Figure1. Hardware Architecture

II. RELATED WORK

There are some factors that we must consider while designing door control system. The system invented must be low priced, scalable so that new device integrated into the new system. A variety of smart system can be considered where the control is via short message service, Bluetooth, internet, IR sensor based, smart cart based etc.

Shiv Kumar proposed smart home design application which can be handled by the owner using internet. Here the PC is used as a server which increases the cost and power consumption.

Deepali recommends android platform version 2.34 ginger bread and 3.1 honeycomb which used java as programming language for smart home security system for disabled and senior citizen. In this research android platform are connected to the home appliances using wires.

Hao shi in his research on home lightening system implement an android development tool and java development kit. Mansi patil used wireless sensor technology and GSM for home automation. Zigbee is used for monitoring and controlling various devices which can be implemented at a low price.

All the above mentioned research inspired us to make a research about the device which can provide the automation of opening and closing the door. The first step about the security about the smart home is locking of the door which plays a major role in the security system.

The system designed to stimulate an electronic key and actuator which is connected to microcontroller. The door is controlled through Android application which is used for giving command as 'open' or 'close'. Actuator provides the motion to the door for opening and closing.

III. COMPONENTS USED

1. Android smart phone
2. Model of house
3. Computer(Server)
4. Adaptor
5. Atmega8 Microcontroller
6. Motor Driver circuit
7. Actuator
8. IP camera
9. Wires

IV. PROJECT DESCRIPTION

The project can be better described by dividing it into two categories that Hardware

1. Software

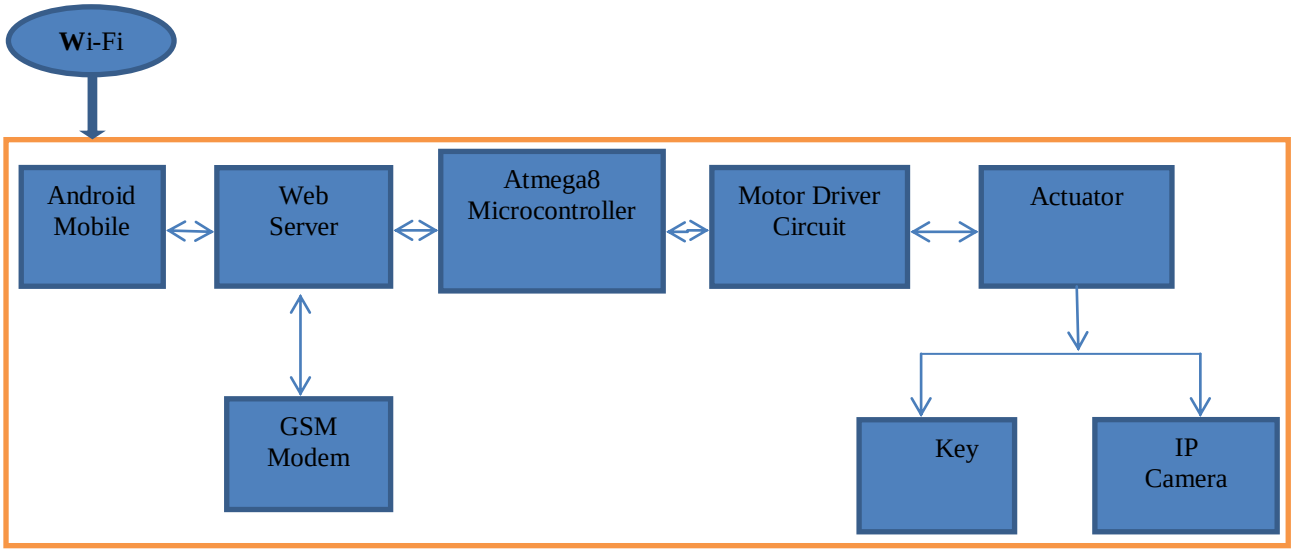

Figure2: Block Diagram of the System

Hardware Implementation and Architecture

There are several steps in hardware design i.e.

1. The design of atmega8 microcontroller
2. The design of power circuit
3. The design of LED circuit
4. The design of motor driver circuit
5. The design of door where the actuator is fitted.
6. The fitting of IP camera
7. Interfacing all the devices through Wi-Fi

The atmega8 microcontroller serves as the heart of whole system. The microcontroller can be linked with other circuit so that they can perform certain function. The microcontroller uses IC L293D and works by entering the program which is created and ready for used instantly.

The block diagram in the figure-1 describes the overall system. The system has a input from android smart phone and the output is the action perform by the actuator which is connected to the door and microcontroller.

No	System Block	Functions
1	Microcontroller	As data processing centre
2	Android smart phone	As data input and for viewing video
3	Battery and adaptor	As the power supply
4	Motor Driver circuit	As a switch
5	LED	As indicator
6	Actuator	To provide the motion to the door
7	GSM modem	For receiving the input when user out of LAN
8	IP camera	For viewing the video

The system requires a program that must be implemented to the microcontroller. The C programming language is used for microcontroller. To run and incorporate the program in microcontroller Arduino software is required.

The mechanism of the device used here is to provide an input i.e. a digital key pad on the software of android smart phone first. If there is any command from the user to control the door the data will be instantly sent to the server via Wi-Fi Network then the input will be receive by the server connected to the microcontroller. The microcontroller circuit serves as a data processor which controls the actuator which is connected to the motor driver circuit.

The microcontroller is the central processor system of the whole system. The microcontroller Arduino has been equipped with an internal EEPROM, flash memory etc. It will Examine the inputs or the orders given to the motor driver circuit, actuator, LED etc.

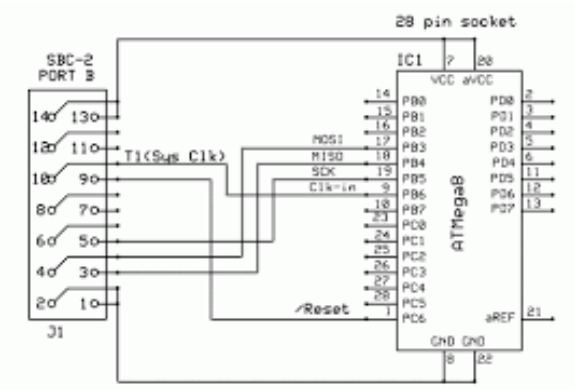

Figure3. Microcontroller circuit

The IC L293D functions as a regulator of the power output by 5volt. Motor driver circuit is used to convert the 5volt input power supply provided by the microcontroller into 12volt power supply. The actuator is connected to the motor driver circuit. This 12volt power supply is in turn used to provide force to the door so that it can be open or closed.

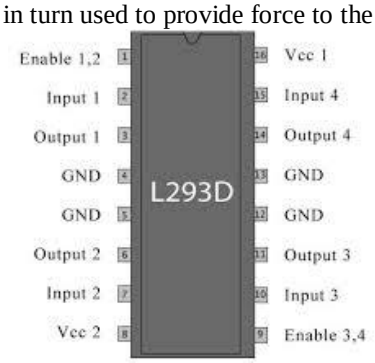

Figure4. IC L293D

IP camera is used to capture the video of visitor which can be viewed by the user on his android phone using android application. The IP camera will only provide run time feed and the recording will not be stored on our server. The server is nothing but a PC on which our web service and the application is hosted.

Software Development

We have used a number of different tools for programing of our door controlling system.

1. Eclipse Indigo ID

We have coded the main application of android smart phone in the eclipse indigo environment and compile as a standard android executable that runs on all the platforms till android version 5.0.2 (lollypop).

2. Android SDK

The android SDK which is developed by google, Inc.is development kit used to program on eclipse.

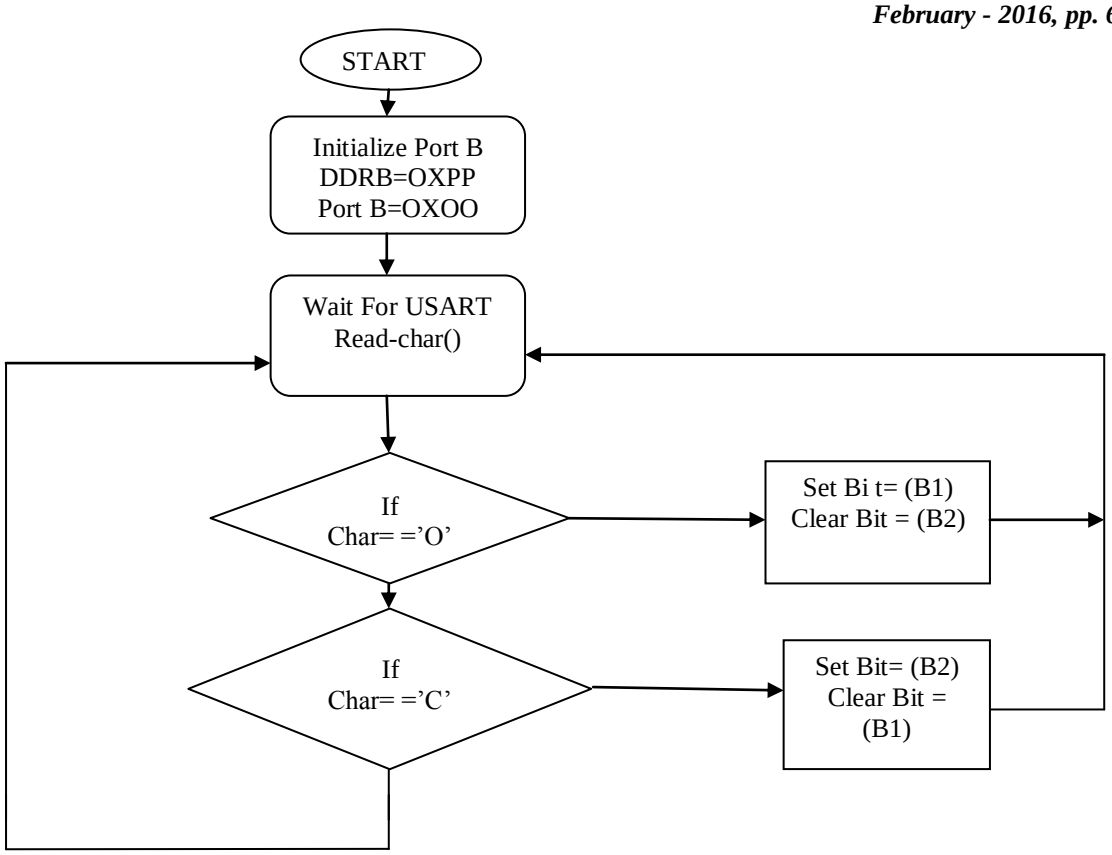

Figure4. Flow of Software

3. Visual Studio2008

Microsoft visual studio is associate degree integrated development surroundings from Microsoft. It's accustomed develop worm for Microsoft windows also as websites, net applications and net services. Visual studio embrace several in-built tools like code editor, debugger, designer for building, GUI application, net designer, information designer, schema designer etc. It conjointly supports completely different programing languages.

We have designed our net application employing a C# that is employed for ceaselessly observation the standing of the door. It will be manually or mechanically handled. It fetches the standing of the door and updates it into the information if the is shut the standing is 'FALSE' and if the door is open the standing is 'TRUE'. There are 2 elements in our windows application on one half there are 3 checkboxes of open door, shut door and stop door mechanically are provided. There are also 2 possibility initial one alter hardware, second run in automatic mode. The second half is for the GSM electronic equipment on that the input messages send by the user are mirrored. We've conjointly designed an online service mistreatment ASP.net that is hosted on IIS (International internal service) in order that it will be accessed anyplace. It's used for checking and change the standing of the door.

Screenshots

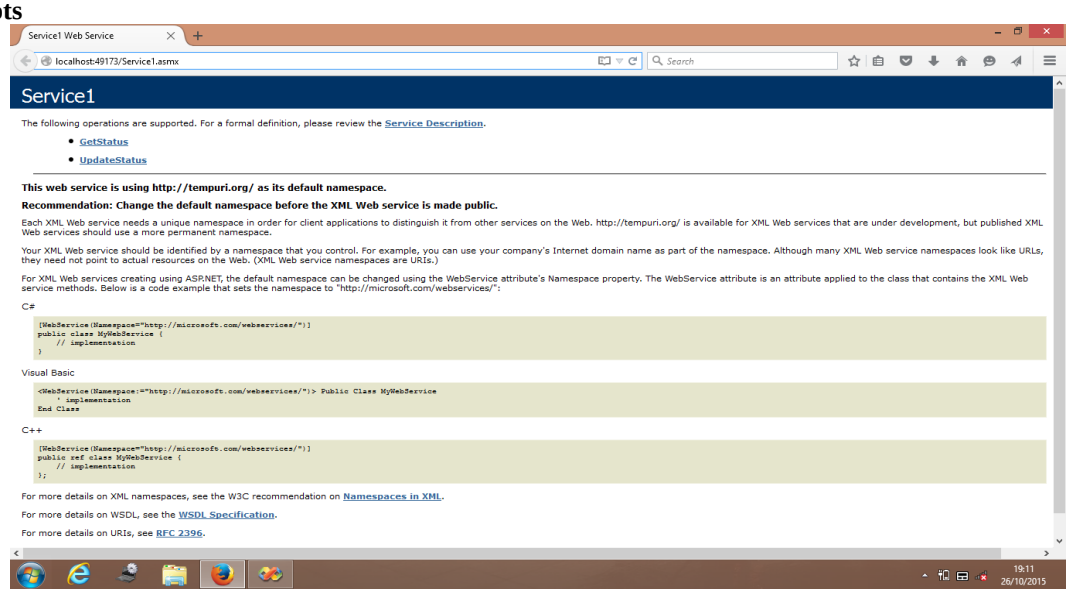

Figure5. web service

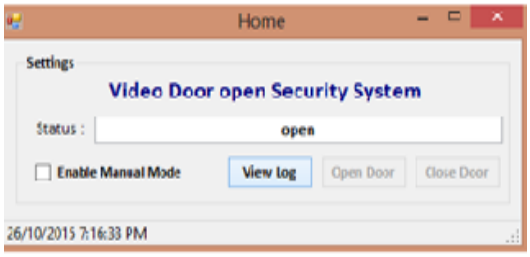

Figure6. Windows application

Figure7. Cover page of android application

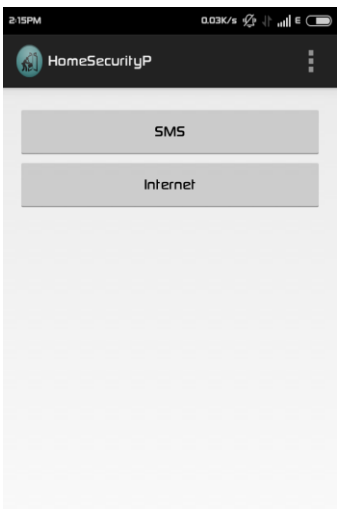

Figure8. Functioning of android application using SMS and internet

V. CONCLUTION

The door automation control system has been experimentally proven to work satisfactorily. The door was successfully controlled from a wireless mobile device using android application and also through the short message system when the user was out of Wi-Fi range. Also the status of door is updated manually by using web service as well as windows application, thus proving it wide compatibility. This project won't solely offer the convenient to the disabled and old individuals however are a boon for them.

VI. APPLICATIONS

The door can be controlled with the help of just a mobile phone which is widely available now- a- days and proves handy so the project is very practical in nature.

Also the project is feasible because the cost of project is very less as compared to expensive telecom based door controlled system available in market which requires an additional cost of installation and also the wired setup.

The door control system makes the life of disabled and elderly people more convenient as they can control the door from wherever they are.

Also we can view the video of the visitor who visit our home even if we are out of the house so it is a boon in today's fast and busy lifestyle.

VII. FUTURE SCOPE

This project can be further developed for providing security to the home. We can deploy a sensor on door lock so that if anybody tries to break the lock the owner will automatically be notified on his mobile phone. Also we can maintain the log file of visitors with time and date in the database and also the video footage can be stored, so that if we can check the detailed information of the visitor at any time. This project can be integrated with complete home automation technique which is used to handle home appliance.

REFERENCES

[1] Android official website. https://developer.android.com/
[2] Microsoft visual studio-wikipedia, free encyclopedia. https://en.mwikipedia.org/
[3] Visual Studio Training courses-Microsoft virtual academy. https://mva.microsoft.com//
[4] Door-automation system using Bluetooth-based android for mobile phone, Lia Kamelia, Alfin Noorhassan,S.R, Mada Sanjay and W.S.,Edi Mulyana-ARPN journal of engineering and applied science 10,octomber 2014, IISN 1819-6608
[5] Home appliances control system based on android smart phone by Sachine Kishor Khadke, IOSR journal of electronic and communication engineering e-ISSN:2278-2834, p-ISSN:2278-8735(may-june 2014)

