

Embedded System Based Home Security Surveillance using Raspberry pi

S. Kaliappan, A. Ezhilarasi, S. Abhianaya Priya, N. J. Nivetha

Abstract- This paper is based on home based security system. In modern world people are instructed on home automation, but don't care about home security. Security is much more important than automation of home because it can save life and commodity of the people. This paper proposes two main important aspects. One of the processes is automatic sending of message to home owner with help of GSM when door is open by unauthorized user using PIC microcontroller and next one is surveillance camera usage for home security by raspberrypi-3. Raspberrypi is used for image processing, image processing can be done only if user can enter wrong password it will indicate to raspberrypi for image processing for finding out the unauthorized person.

Key Words: Home automation, camera, GSM, PIC-microcontroller

I. INTRODUCTION

In the world main important problem is security of an individual person. People have many problems in security system, in that one is home security. With the development of science and technology and the development of quality of people's life, the safety of the people put forward higher requirements for the home environment. In smart home

II. LITRATURE SURVEY

Home based IoT computerization and Surveillance System Internet of Things is one major part in the current world. It is used to analyze and collect the information from the various actuators and sensors sends the data to the abuser interface over a wireless connection. A novel outcome world in sequence and technologies for communication. Security is flattering an imperative issue now days the opportunity for intervention are growing. The fire and leakage of gas are the imperative necessities of security system for the people [2]. To aspire of this work is with security and surveillance to home internet based monitoring system. In this work, the proposed system is designed Linux OS via ARM-11 architecture based

Raspberrypi-3board. The Raspberry Pi-3board via driving circuit (L293D) interfaced with motor to control the door at the same time as the camera is connected to the USB of Raspberry Pi- 3board. Nowadays people using technology to computerize in their tasks and to take into service for monitoring the CCTV or the IP camera for feed the intruders. The computerization put into operation here as healthy. A Cameras are present in particular place are greatly rampant, any person has to monitor and recorded the video. The close watch practices that are becoming more common these days and estimated gratitude system is well-organized the same as healthy. The faces recognize automate the task of alert system via through the user mail, and the mobile declaration. There is no human intervention is mandatory to alert the police. A raspberrypi module is projected the system uses, and a module of camera that fits in the CSI (camera serial interface) of the raspberrypi chip [3]. On the other hand, and USB camera accomplish can be use the same task. The concept of automation and today's life rolls around the things that are automated for next generation. In this systems sense the temperature and humidity, controlling light switches allow users to lock and unlock a door from are remote location. The invention based on smart technology using smart humans. A human life makes smart technology to easy and updated. In increasing function abilities to include smart lock based alarm system, and controlling the household appliances from the remote location, and smart water tank, Mosquito sensing. This system is specially designed for home automation with increased some functionalities and using an Internet connection protocol as Wi-Fi. Due to disease cause for mosquitoes can be prevented by making use of the wished-for system. It helps in reducing the human attempt sasitisautomated [4]. The automated home Surveillance based System with Pyro electric Infrared Sensor Using GSM. The important security system in people life today's as it protects the home from murders and theft, burglary, and has become routine in big cities. It is used in many places like bank locker room, store house, ATM, industrial or offices etc. By use of smart sensors based home security system designed like pyro electric infrared sensor (PIR), ultrasonic sensor to detect an intruder in home. To detect movement of objects by using the PIR function and ultrasonic sensor is to detect changes in temperature of human in infra red radiation. These sensors are built in the order of microcontroller. There is any unauthorized person detects the intrude is present, and the system is automatically sound a buzzer and sends SMS [5].

Manuscript published on 30 December 2018.

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After this, image by web camera capture and MCU (microcontroller unit) sends sensor signal to system.



Fig.1. PIC Microcontroller

III. SYSTEM OVERVIEW

The proposed consists of PIC microcontroller, GSM, DC motor, camera, personal computer, buzzer, LCD display. PIC is used in this project is low cost and it is used in industrial application. In PIC has many series in that we used PIC16F877a (16 referred to 16 bit processor, Preferred to flash memory, 877a referred to series name). It is a 40 pin IC, it has 32 pin for input and output, and it has 3 timers. A Raspberry Pi-3_RaspberryPi is also called as mini computer. It can use for higher end application like image processing and industrial automation. It has 4 USB port and it operate at 5v [6]. It has CPU and GPU in it, SD cards lot is present in pi-3 processor.



Fig.2. RaspberryPi-3

A. DC Motor

In this proposal dc motor is used to open the door automatically with the help of relay and corresponding code for controlling the DC motor.



Fig.3. DC Motor

B. Relay

The Relay is one type of mechanical switch. Electric current flow through there lay coil, coils converted into electro magnet by this circuit can be closed automatically. These relays are used in high last part industrial application devices have relays for their successful working [7]. By microcontroller relay can be control automatically with proper coding.

C. GSM

In Global System for Mobile communication has been used in this system for sending the message to home owner [7]. The purpose of GSM in this system is to send message of door opening and closing



Fig.4. Relay



Fig.5. GSM Module

IV. BLOCK DIAGRAM

The proposed system is when our door is open and close it send the information to owner through GSM, key pad is used to enter the password to open and close the door automatically with help of DC motor, [12] if user enter the correct pass word in key pad is verified using the microcontroller code and controller send the instruction to open or closed or automatically.

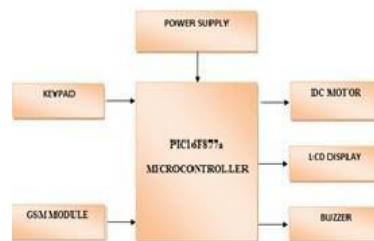


Fig.6. Block diagram of Proposed System



Fig.7. Block diagram of Proposed System

At the same time buzzer and timer is ON in the system if the user enter the correct password in certain time period it does not send any message to home owner but password is wrong it will send message as unauthorized user using the system, and few minutes it will automatic call to owner. Surveillance camera is used to capture the live video and that video can processed by RaspberryPi-3 and stored in the hard disk for feature use.

V. SYSTEM ARCHITECTURE

The Architecture of system is divided into two parts, first part is opening and closing of home door with secured manner and second part is Surveillance of home using camera. The system consists of PIC microcontroller, LCD display, keypad, buzzer, GSM module, DC motor and surveillance camera. PIC microcontroller is used for controlling the hard ware with help of embedded software, controller is 16 bit process or it can use by many industrial application system. Keypad is used in this system input is processed with microcontroller and processed date is display on the LCD display, buzzer is on output device is used in the system[7]. GSM module send message to the owner of the home with two conditions, when our door is open and close is will send the message to the home owner. By this alert user can know he is authorized or unauthorized user opening of door. Surveillance camera is used to capture the live video and that video can be processed with help of Raspberry pi and stored in the hard disk for feature use[8][9].



Fig.10. ARM button is pressed and asks for password



Fig.11. Password is entered



Fig.12. If we want to disarm

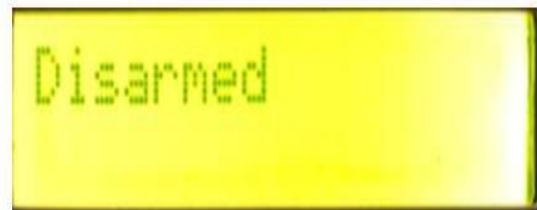


Fig.13. Alarm Disarmed



Fig.14. A way mode activated

VI. FLOWCHART

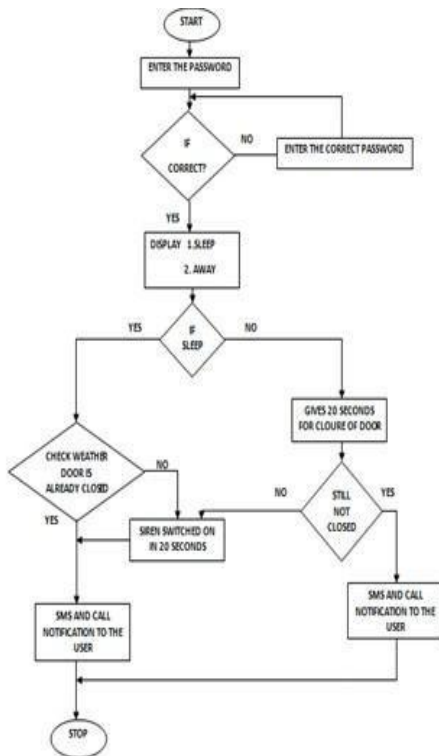


Fig.8. Flow chart of the proposed system

VII. RESULTS



Fig.9. Sleep or away mode to be activated



Fig.15. Normal vision camera at 4.30pm

VIII. CONCLUSION

This proposal is used to help home security to next level, this method is cost effective and highly reliable compared to the previous at present method [10]. This can be implemented in realtime environment. This system can reduce the man power and it is effective solution for the realtime problem in the world.

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