Home Security System Using PIBOT

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ABSTRACT

Recently the crime rate is increasing day-by-day in every place like shops, bank, etc. In this design using Raspberry Pi 3 model is like a mini computer. The image is captured by the USB camera is interfaced with the raspberry pi 3 model, to detect the unknown person and send the image to authentic user. This system can be used within the local area network using WI-FI technology. The raspberry pi are programmed by open CV (computer vision) python language.

Keywords: Raspberry pi 3 model and Open CV python language.

1. INTRODUCTION

The main objective of the project is to increase the home security system. The camera is interfaced with the raspberry pi model 3 which is used to detect the unknown person and capture the image and its send to the authentic user. The user and the nearby police also receive the message. The email is send to the authentic user. The email is used to view the unknown person image in the home. The message is send automatically when the camera detects an unauthorized person in the home. The image of the unknown person is stored and the image is send to the authentic user Email. The message and Email is send by using open CV and python coding.

2. LITERATURE SURVEY

The implementation of multi environment robot using Linux platforms are having the major disadvantage is the capturing image or video can be used to view in the desktop only. It cannot view in the smartphones. A novel equation based classifier for detecting human in image are the camera only detect the structure of head and shoulder of the human. The major disadvantage of the system is the unauthorized person wear the box or helmet on the head means it cannot take.

3. EXISTING SYSTEM

In existing system, to detect unknown person, the camera is captured the video and send to the authentic user and the user will take further actions. In this system using raspberry pi 2 model and the camera are interfaced on it. The robot can identify the unknown person send the alert to the user. The user will have the webpage to watch the live streaming video. The camera detects the motion of the object using the background subtraction algorithm. Then separate Wi-Fi adapter or Ethernet is interfaced to the raspberry pi 2 model.

Disadvantage
- The alert is send only to the authentic user
- It cannot support the window operating system
- The separate Wi-Fi adaptor is connected to the device

4. PROPOSED SYSTEM

The proposed system is used to build for monitoring the unauthorized in the home using raspberry pi 3 model. The motor are connected to the raspberry pi using GPIO pins and CSI camera port is connected to the Raspberry pi camera .The Raspberry pi foundation recommends the python language for coding. It is made of software called NOOPS (New out of box software) which is easier to installing an operating system on the raspberry pi.

The camera detect the unknown person in the home, capture the image and immediately send the message to the user and the nearby police station. The capturing image command is communicated to the raspberry pi and send the picture to the user email-id. The user received the message of unknown person is detected and the authorized person will open the email to see the unauthorized person through the Raspberry pi. It will send the picture one by one to the mail. And that same time the home address of the user will be send to the police station by message. The police will take the further actions. In this system we using mapping algorithm. This algorithm is used to detect and recognize the unauthorized person send the picture to the user mail id.
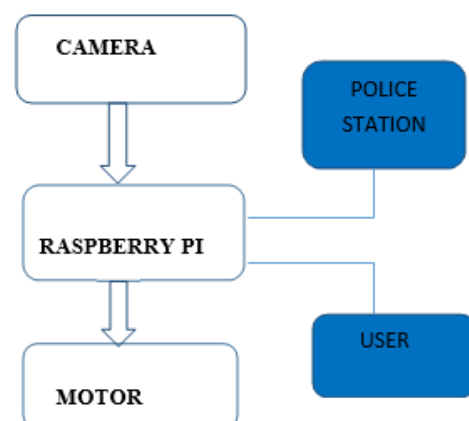

Fig.1.Block diagram

Raspberry Pi

The name "Raspberry Pi" is a combination of "a fruit name" and a play on Python. Three years later, the Raspberry Pi Model B entered mass production through licensed manufacture deals with Element 14/Premier Farnell and RS Electronics, and within two years it had sold over two million units.

Fig.2. Raspberry pi 3 model

Features of Raspberry Pi

- 40pin extended GPIO
- CSI camera port for connecting the Raspberry Pi camera
- DSI display port for connecting the Raspberry Pi touch screen display
- 4xUSB 2 port
- 4 pole stereo output and composite video port
- Full size HDMI
- Micro SD port for loading your operating system and storing the data

ARM Processor

- It has a Broadcom BCM 2837 systemon chip module and has a ARM cortex-A53 processor
- The Broadcom used in the Raspberry Pi is equivalent to a chip used in an old smart phone. It operating at 700MH
- On the CPU level the performance is similar to a 300MHZ

Power Source

The raspberry pi is a device which consumes 700mA or3W or power. It powered by a Micro USB or the GPIO header. The good smartphone charger will do the work of powering the Pi.

SD Card

The Raspberry Pi does not have any onboard storage available. The operating system is loaded on a SD card which is inserted on the SD card slot on the Raspberry Pi. The operating system can be loaded on the card using a card reader on any computer.

GPIO

General Purpose Input Output is built on the integrated circuit. The capabilities of GPIO are:

- It can be configured to be input or output
- It can be easily enabled or disabled
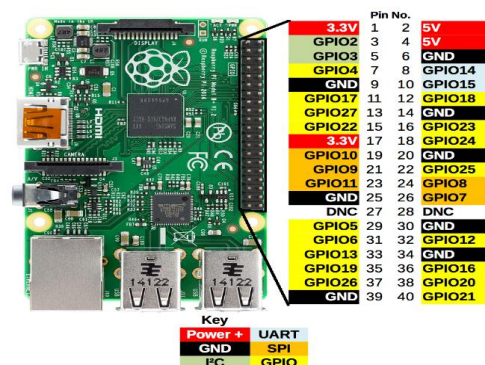- Input values are readable by high=1, low=0.Output values are readable or writable

Fig.3. GPIO pin

Components

- Display the serial interface (DSI) connector for LCD
- A standard 3.5mm TRS connector is available on the Raspberry Pi for stereo audio output
- CSI-camera serial interface for digital camera interfacing
- HDMI-high definition multimedia interface for connecting HDMI screens

DC Motor

In this system has two wheeled robot using the DC motors. It has high efficiency and high torque. The torque is used to move the robot and the RPM (rotation per minute) of the robot is loaded. When the torque is greater than the force, the robot movement is in opposite direction. If the torque is lower the force means the motor will be stop or it may be damaged. The voltage of the DC motor is 12 to 24v. If the voltage is lower than the constant voltage means the torque cannot overcome the internal friction from the brushes.in case the voltage value is higher the constant voltage means it may be over heated or damaged. And the current value in motor is 1 to 2 amperes. The motors are having the differential drive for separately drive the wheel can turn in places.

Fig.4. DC motor

USB Camera

The camera are used for security purpose. It is fully fledged for motion detection, recording the image in SD card and multi camera functionality. The CSI camera is used in the system. It is interfaced between the camera and host

processor. CSI camera are serial interface with the digital camera interfacing. The resolution of the USB is 2megapixel.

Fig.5. USB camera

Hardware Components
- Raspberry Pi
- Gear motor
- Mobile
- Camera

Software Components
- Raspberry Pi operating system
- Python
- Open CV(computer vision)

5. RESULT
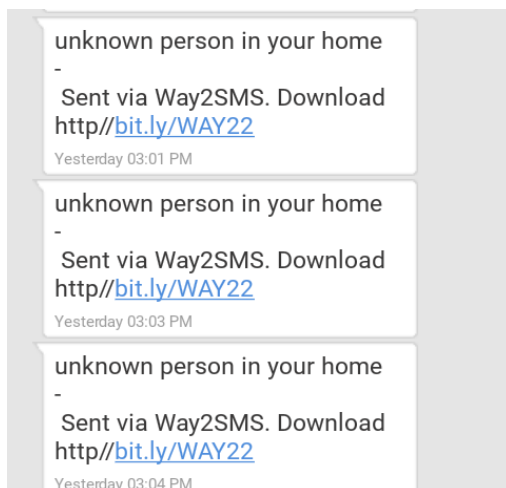- The message is send to the user "unknown person is detected in your home"

Fig.6. Message sends to the user

- The message sends to police station
- The camera is used to capture the unauthorized person in the home and send to the user mail. The camera is interface with Raspberry Pi
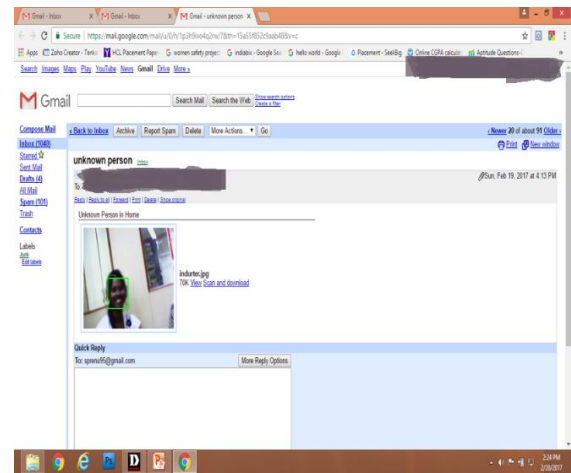- The camera sends the picture one by one to the user mail id

Fig.7. Email sends to the user

Fig.8. Overview of PIBOT

6. CONCLUSION

The main aim of our project is to monitoring the sensitive area or unreachable area. The system is designed by low cost. It is more efficiency for the authentic user. The authentic user easily finds the unauthorized person in their home. In future scope to develop the robot to move in the line by line follower motion by attaching the particular sensors. And adding components of blowing perfumes when the users open the door at that time only. If the data can transmitted per second is fast without any losses like noise in the data then the video can be transmitted.

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