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Smart Intelligent Streetlight to Safeguard Human Using IOT

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ABSTRACT: Smart Intelligent Streetlight system is designed to ensure safety and to prevent energy wastage .A Wireless camera is placed on top of the street light to track the actions performed on the street, where the images are stored in a cloud storage . In addition to this, a wearable device is placed on the clothes, wherein in-case of any emergency or danger, the person can press this button which raises an alarm at the streetlight .Each area's street lights are connected to the particular area's police station and each of them has a cloud accessible account. we use siren as alert alarm to prevent robbery attempt at the earliest .The light on the pole starts to glow in red and rotate through the light in rotary motion when an event is occurred. Additionally, panic button (wearable device) is injected with person's details and contact number, it sends multimedia message of the incident's spot to the victim's family members.

KEYWORDS: Smart Streetlight, safety, prevent energy wastage, cloud account

I. INTRODUCTION

The streetlights is accustomed to cut the municipal energy waste up to 50-70%.The system is especially accustomed to track the crimes happening at the road. The proposed system is more like a safety system during emergency. The device can be fitted in a jacket (similar to a blazer for women). It is an easy to carry device with more features and functions. The emergency panic button is held to one of the buttons of the jacket. The main purpose of this device is to intimate the parents and police about the current location of the victim. A GPS system is used to trace the current position of the victim and a Wi-Fi module is used to send the message (location with Image) to the predefined numbers which is stored while registering with panic device. There are several applications that reduce the risk of sexual abuse or robber attempt or a murder by sending messages , but in our system we also provide a brightness in street light with emergency siren alarm .It reduces the energy up to 70% by emitting the light to glow at medium in normal cases and up to 100% brightness level in case of emergency. Capture camera is used to capture the incident whenever panic button is pressed and intimate the message to nearby police headquarters and victim's family members .The footages are stored in cloud storage and can be accessed by the police.

[1] Research and development of a mobile based women safety application with real-time database and data-stream network-2017 was proposed by Dantu Sai Prasanth,Gautam Patel,Bharathi.The application requires an initial registration along with emergency contacts and the user is asked to update the emergency contacts from time to time. When the user is travelling from one place to another, the dynamic GPS tracking offered by PubNub's channel is turned on to view the user's location on a map.[2]Smart Security Solution for Women Based on Iot-2016 was proposed by G.C Harikiran, Karthik Menasinkai, Suhas Shirol, when media broadcasts more of women's achievements rather than harassment. It has Smart phone device that has access to the internet and comprises of wearable smart band [3] IoT based smart and adaptive lighting in street lights-2017 was proposed by B.Abinaya,S. Gurupriya, M.Pooja, This system is mainly used for smart and weather adaptive lighting in street lights. The project is implemented with smart embedded system that controls the street light based on the detection of sunlight.

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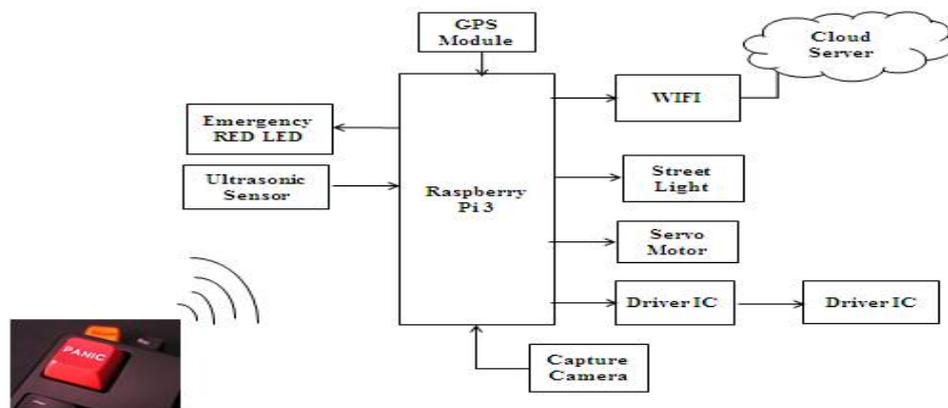
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The work in this paper is divided into four stages-1) Registration 2) Sensor activation 3) Notification 4) Cloud access. We need to register the details and contact number of the person while getting the wearable device. On pressing the panic button, it sends signal to the nearby Streetlight using Bluetooth or Wi-Fi to enable the siren alarm. On receiving the signal in the Streetlight, it immediately sends notification to the nearby police headquarters indicating a threat being occurred at that place. On intimating the location of the incident spot it also sends multimedia message to the police headquarters. These images are captured and stored in a cloud storage.

II. RELATED WORKS

In proposed system, we are using raspberry pi as a hardware as it performs multiple task and functions. And we use camera interface which is embedded in raspberry pi board to capture the incident spot and sends to the nearby police headquarters indicating a threat being occurred at that place. Every actions on the camera is being stored on a cloud server. A siren alarm is placed on the pole of the streetlight and light starts to glow in red indicating an action caused, when we press the panic button. It also ensures energy wastage by 50%-70% by emitting low brightness at normal time and emitting high brightness of the street light when an incident occurred.

BLOCK DIAGRAM



III. WORKING PRINCIPLE

The system works under the circumstances whenever a threat is attacked a person. The person can defend himself from robbery, theft, harassment at the earliest. The victim needed to wear the wearable device which he can press in case of emergency. Bluetooth device searches for nearby Streetlight by activating the sensors and produces a siren alarm and light on the pole starts to glow in red indicating a person is in danger. Ultrasonic sensor used to detect the range of panic button (wearable device) to the Streetlight. It matches with the nearby Streetlight to cause an alarm. With help of GSM it sends multimedia message with the incident spot and location to the police headquarters and it also sends messages with incident image to the victim's family members. The footages recorded by the capture camera are stored in a cloud server. Capture camera is connected to the raspberry board to capture the movements. The camera is water, dirt, and corrosion resistant.

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IV. REGISTRATION

Firstly, we need to register the details and contact number of the person while getting the wearable device. It used to send multimedia message using GSM to the victim's family members when he/she presses the panic button indicating a threat is occurred to them.

V.SENSOR ACTIVATION

On pressing the panic button, it sends signal to the nearby Streetlight using Bluetooth or WiFi to enable the siren alarm. Ultrasonic sensors are used to detect a person around in a range of 100-200m and sends signal to the nearest Streetlight to activate it.

VI. NOTIFICATION

On receiving the signal in the Street light, it immediately sends notification to the nearby police headquarters indicating a threat being occurred at that place. Using GPS, location of the Streetlight is send to the police headquarters. Addition to this, it also sends multimedia message with the incident spot to the police cellular.

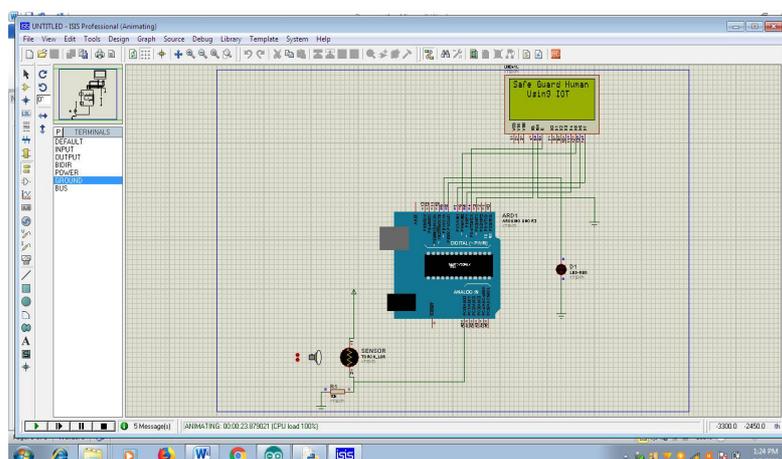
VII.CLOUD ACCESS

On intimating the location of the incident spot it also sends multimedia message to the police headquarters. These images are captured and stored in a cloud server. Every police station in the city can access this cloud server using mail server like SMTP and can retrieve data anytime. On accessing the cloud server, date and time of the incident can be retrieved.

VIII.EXPERIMENTAL RESULTS

Figure(A) shows the simulation results of the raspberry pi hardware using isis professional software. It describes the text message when the button is inactive

Figure(B) show the alert message when the panic button(wearable device) is pressed. It notifies the alert message to the nearby police headquarters indicating a threat is occurred.



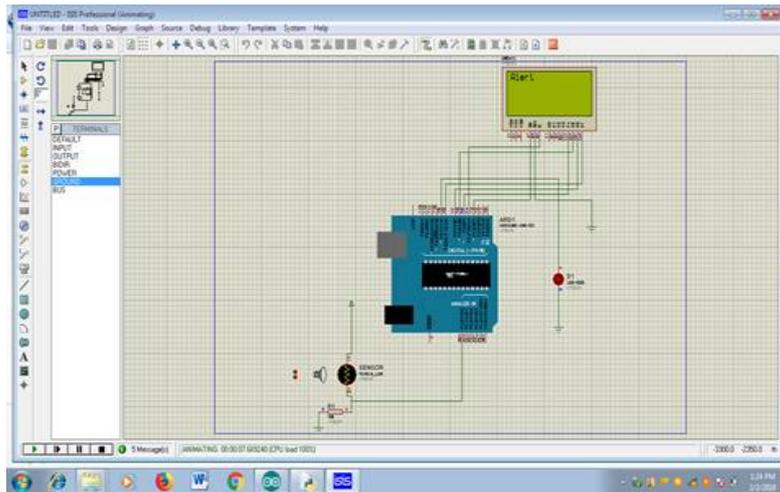
figure(A)

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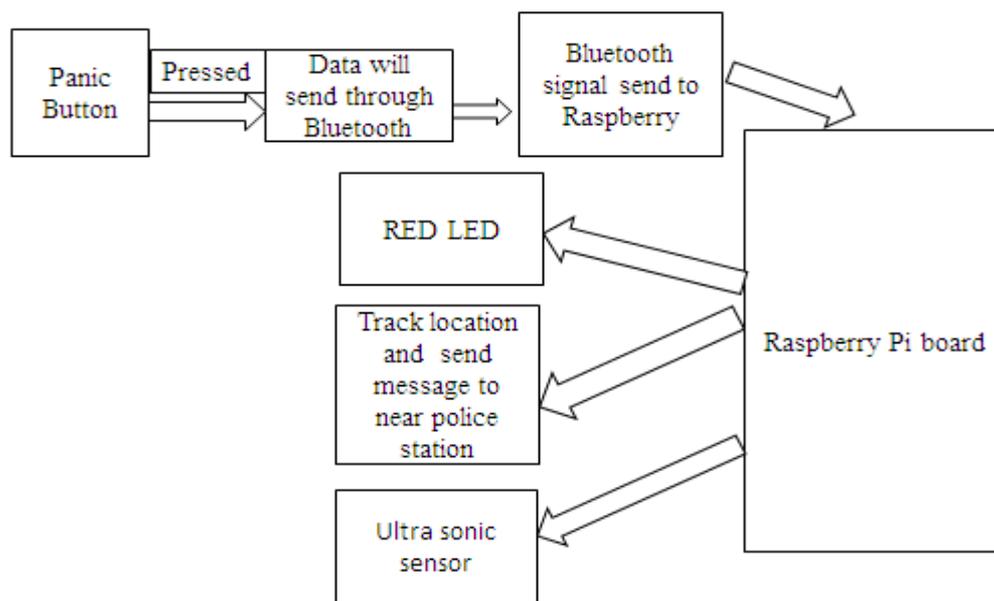
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Figure(B)

Figure(c) describes the flow diagram, when the panic button is pressed, it sends the signal to the nearby streetlight using Bluetooth or Wi-Fi. The Bluetooth activates the sensor in raspberry board and red LED emergency light will starts to glow in the pole. Ultrasonic sensor are used to sense the object from the wearable device (panic button) to the street light. It sends up to the range of 100 to 200 m. Further it sends the location (latitude & longitude) and capture the image using capture camera and sends to the nearby police station

Figure (d) On the receiving the alert message it sends alert notification to the cloud account which can be accessed by the police headquarters anywhere in the city. Additionally, it sends alert notification to the victim’s family members through multimedia message.



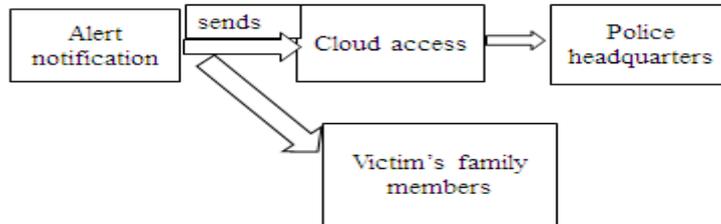
Figure(c)

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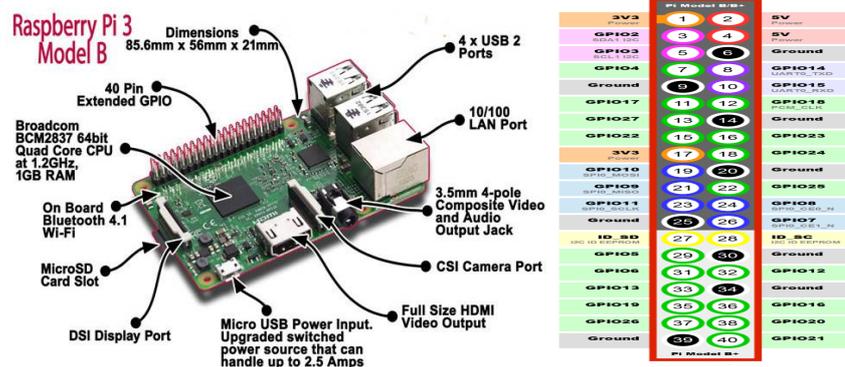


Figure(d)

IX.COMPONENTS REQUIRED

1.RASPBERRY PI

The computer circuit board (PCB) homes the input and output connectors. Currently, the muse is a commerce unadorned PCB — which means there's no enclosed Raspberry Pi case — and can unleash a less expensive version. These 2 versions are build up to the discharge the ultimate product. The ultimate version are an academic edition with case, documentation, and pre-loaded academic package. On the package facet of things, there are presently 3 Linux-based operational systems supported by the Raspberry Pi. The microcontroller we use here is Raspberry pi ARM Cortex processor. It is interfaced with a panic button, a GPS module, a Wi-Fi module and an emergency light. If the switch is pressed, it activates the street light to get brightness high to capture the attention of the people nearby for help. The program is developed in python language to demonstrate the system capability in providing real time response



2.HDMI TO VGA CONVERTER

This converts the HDMI digital signal to VGA analog signal. It permits laptop, Laptop DVD, PS3,Xbox360 Sky HD, Apple TV and different HD device to be connected to VGA monitor, projector. It supports the high definition output of 720P or 1080P.It connects a pc, laptop, pill or different device with HDMI to a monitor or projector with a VGA port; A VGA cable is needed to attach from the adapter to a monitor or projector. Implementation of an identical multimedia system interface was driven by a extremely competitive client market wherever time to plug may be a crucial issue.

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3. DCMOTOR

GENERAL DESCRIPTION

A DC motor converts electrical energy into mechanical power. DC or electrical energy motor works on the principle, once a current carrying conductor is placed in an exceedingly magnetic flux it experiences a torsion and encompasses a tendency to move. This is often called driving action. When magnetic flux and force field move they manufacture a mechanical force. Thus, a DC motor used a voltage below the given voltage. But below one thousand rpm, the speed becomes unstable, and therefore the motor won't run smoothly.



FEATURES

- provide voltage: 5V DC
- more reliable and low price
- Speed: 1000rpm
- The sector may be magnet

4. PANIC BUTTON

A panic alarm button is a device designed to help in alerting someone in case of emergency. The panic button is embedded in the wearable device which can be carried by the people. In case of any emergency, victim can press this button to activate the action sequences and to prevent robbery attempt at the earliest. Panic alarm button sends signal to the nearby streetlight via Bluetooth or Wi-Fi and activates the siren.



5. SINGLE RELAY BOARD

A relay is a switch which is operated on electromagnetically which is activated by an electric current. A single relay board arrangement contains driver circuit, power supply circuit and isolation circuit. A relay is assembled with that circuit. The switching mechanism is carried by electromagnet. The driver circuit contains transistors for switching operations. The transistor is used for switching the relay. It is used when one signal is used to control a lot of circuits. An isolation circuit prevents reverse voltage from the relay which protects the controller and transistor from damage. The input pulse for switching the transistor is given from the microcontroller unit. It is used for switching of a single device.

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6. BLUETOOTH

A wireless technology called Bluetooth is used normally for exchanging information over short distances (using short-wavelength ultrahigh frequency radio waves within the philosophical system band from a pair of 4 to 2.485 GHz) from fastened and mobile devices, and building personal space networks (PANs) had been originally planned as a wireless various to RS-232 knowledge cables . Bluetooth is embedded in raspberry board to enhance connectivity to the Streetlight. About 100 - 200m radius is covered by the Bluetooth device and connects to the nearby Streetlight to enable safety.



7. ULTRASONIC SENSOR

An Ultrasonic or unbearable sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back. it is possible to calculate the distance between the sonar sensor and the object by record the time between the sound wave being generated and the sound wave bouncing back.



X.CONCLUSION

- To provide energy consumption and to
- To prevent energy wastage
- To ensure security to the individuals, and to defend themselves from the threat at the earliest.
- The system is Cost economical, Reliable
- Dim and brightness of the street lights is enabled
- Wireless communication is created

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