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IOT Based Smart Safety Purse

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ABSTRACT: The safety of women is a concern of increasing urgency in India and other countries. The primary issue in the handling of the see cases by the police lies in constraints preventing them from responding quickly to calls of distress. The constraints include not knowing the location of the crime, and not knowing the crime is occurring at all: at the victim's end, reaching the police as surely and discreetly is a challenge. To aid in the removal of these constraints, this paper introduces a woman with a reliable way to place an emergency call to the police. The user can easily and discreetly trigger the calling function by pressing a button. Message contains the geographical location of the user and a phrase indicating that the user is in distressed situation, is immediately sent to the police. This application will send the user's location to the registered contacts for every few seconds in the form of message. The registered contacts and GPS location are saved from time to time in a database.

KEYWORDS: Node MCU, GPS, Internet of Things.

I. INTRODUCTION

Today, Internet application development demand is very high. So IoT is a major technology by which we can produce various useful internet applications. Basically, is a network in which all physical objects are connected to the internet through network devices or routers and exchange data. IoT allows objects to be controlled remotely across existing network infrastructure. IoT is a very good and intelligent technique which reduces human effort as well as easy access to physical devices. This technique also has autonomous control feature by which any device can control without any human interaction. Things in the IoT sense, is the mixture of hardware, software, data, and services. Things can refer to a wide variety of devices such as DNA analysis devices for environmental monitoring, electric clamps in coastal waters, Arduino chips in home automation and many others. These devices gather useful data with the help of various existing technologies and share that data between other devices. Examples include Home Automation System which uses Wi-Fi or Bluetooth for exchange data between various devices of home.

II. EXISTING METHODS

There were many previous works carried out on smart safety. The previous works on smart safety help us to get more ideas and to execute our prototype effectively. These are a few of them which helped us to get ideas for our current prototype

II. A. PROJECTILE STUN GUNS

Wayne C McDaniel, Andrew Benwell, Scott Kovaleski (2009) devices apply high voltage, low amperage, pulsatile electric shocks to the subject, which causes involuntary skeletal muscle contraction and renders the subject unable to further resist. In field use of these devices, the electric shock is often applied to the thorax, which raises the issue of cardiac safety of these devices. An important determinant of the cardiac safety of these devices their electrical output. Here the outputs of three commercially available projectile stun guns were evaluated with a resistive load and in a human-sized animal model (a 72 kg pig).

II.B. FEMME DEVICE

D.G.Monisha, M.Monisha, G.Pavithra and R.Subhashini (2016) device is a security system, specially designed for women in distress. By using arm controller for the hardware device is the most efficient and it consumes less power. The radio frequency signal detector to detect hidden cameras. The arm controller and android application in which both the device and the smart phone are synchronized using Bluetooth, hence both can be triggered independently. That can record audio for further investigation and can give an alert call and message to the pre-set contacts with the instant location every 2 minutes and can be tracked live using this application. Hidden camera detector is also a distinct feature using which we can ensure our privacy.

II.C.SMART SHOE FOR WOMEN SAFETY

Vishesh Sharma, YatiTomar and D.Vydeki (2019) it starts sending the GPS location to the ice contacts and police control rooms. There is a pulse rate sensor embedded in the device that senses the pulse rate of the person and a temperature of the person. The band when thrown with force the force sensor will get activated and sends the current location of the victim. An electric shock circuit is designed that emits electric current. On the top of the band screen there are two metal points come in contact with any surface or anybody. the device supports a micro USB charging. A smart application will be developed on the android platform which is connected with the device via Bluetooth interface that shows the sensed data of the subjected to the ice contacts. Until the device is turned off it will send the location on the interval of 5mins and will keep on beeping continuously.

III. PROPOSED SYSTEM

III.A.EMBEDDED SYSTEM OVERVIEW

An Embedded System is a computer device conceived for different control functions within a larger system, often with computational constraints in real time. It is also integrated in a computer system, which includes hardware and mechanical components. A general-purpose computer such as a personal computer, on the other hand, is built to be versatile and satisfy a wide variety of end-user needs. It controls many devices in common use today.

Physically, the Embedded System range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights and factory. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure.

Others also have efficiency requirements that must be met in real time, for reasons including health and usability. Others could have minimal to no performance requirements, which would simplify the device hardware to minimize costs.

III.B.PROPOSED METHODOLOGY

The system is interfaced with Node MCU 8266 in order to control entire device. Node MCU is a low-cost open source IoT platform. It initially included firmware which runs on the ESP8266 Wi-Fi SoC from Espress if system, and hardware which was based on the ESP-12 module. Later support for the ESP32 MCU was added.

The architecture of proposed system consists of Node MCU 8266 controller, as a main source and it receives input signals from the sensor, where thereby the sensors receives the input signals from a human who is in threat or in danger or in abnormal situation. Wi-Fi is a family of networking technology based on IEEE 802.11 family of standards, which are commonly used for local area networking of devices and internet access. Wi-Fi is a trademark of the non-profit Wi-Fi alliance.

Block Diagram

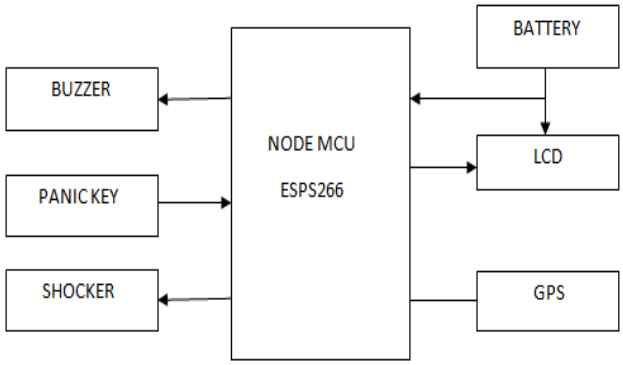

FIGURE 1.Block Diagram

The entire system consists of an Arduino Uno, Power supply, Regulator, Battery, Water Turbine, LDR Sensor, Relay, Load, Water level indicator. The proposed system is based on the block diagram as shown in the figure.

IV. HARDWARE DESCRIPTION

Hardware Components

- Node MCU
- Relay
- Buzzer
- IoT Module
- Power Supply

IV.A Node MCU

FIGURE 2.Node MCU

ESP8266EX offers a complete and self-contained Wi-Fi networking solution it can be used to host the application or to offload Wi-Fi networking functions from another application processor. When ESP8266EXhosts the application, it boots up directly from an external flash. In has integrated cache to improve the performance of the system.
The ESP8266 is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by Shanghai-based Chinese manufacturer, Espressif Systems. The chip first came to the attention of western makers in August 2014 with the ESP-01 module, made by a third-party manufacturer, Ai- Thinker.
This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands.
However, at the time there was almost no English-language documentation on the chip and the commands it accepted. The very low price and the fact that there were very few external components on the module which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation. The ESP8285 is an ESP8266 with 1 MB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi. The successor to these microcontroller chips is the ESP32.

IV.B Relay

It can control high voltage electronic devices using relays. A Relay is actually a switch which is electrically operated by an electromagnet. The electromagnet is activated with a low voltage, for example 5 volts from a microcontroller and it pulls a contact to make or break a high voltage circuit.

FIGURE 3. Relay

We have those 2 sets of pins on the other side of the board. The first one has four pins, a ground and a VCC pin to control the module, and two In1 and In2 pins for input. The second set of pins has 3 pins between the JDVcc and the Vcc board, with a jumper. In such a configuration the relay's electromagnet is operated directly from the Arduino board, and if anything goes wrong with the relay the microcontroller may get hurt.

IV.C Buzzer

FIGURE 4. BUZZER

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical use of buzzers and beepers is giving sound indication to the users.

IV.D IoT Module

FIGURE 5. IoT Module

The internet of things (IoT) is the network of physical devices, vehicles, buildings and other items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. In 2013 the Global Standards Initiative on Internet of Things (IoT-GSI) defined the IoT as "the infrastructure of the information society." The IoT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems, which also encompasses technologies such as smart grids, smart homes, intelligent transportation and smart cities. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing internet infrastructure.

IV.E Battery

A battery is a device consisting of one or more electrochemical cells with external connections for powering electrical devices such as flashlights, mobile phones, and electric cars. When a battery is supplying electricpower, its positive terminal is the cathode and its negative terminal is the anode. The terminal marked negative is the source of electrons that will flow through an external electric circuit to the positive terminal. When a battery is connected to an external electric load, a redox reaction converts high-energy reactants to lower-energy products, and the free-energy difference is delivered to the external circuit as electrical energy. Historically the term "battery" specifically referred to a device composed of multiple cells, however the usage has evolved to include devices composed of a single cell. Primary (single-use or "disposable") batteries are used once and discarded, as the electrode materials are irreversibly changed during discharge; a common example is the alkaline battery used for flashlights and a multitude of portable electronic devices. Secondary (rechargeable) batteries can be discharged and recharged multiple times using an applied electric current; the original composition of the electrodes can be restored by reverse current. Examples include the lead-acid batteries used in vehicles and lithium-ion batteries used for portable electronics such as laptops and mobile phones.

FIGURE 6.Battery

IV.F ATMEGA 328P

Microchip Technology ATmega328 8-bit AVRMicrocontrollers (MCUs) are high-performance RISC-based devices that combine 32KB ISP Flash memory with read-while-write capabilities, 1KB EEPROM, 2KB SRAM, 23 general-purpose I/O lines, 32 general-purpose working registers, serial programmable USART, and more. ATmega 328 has three types of memories e.g. EEPROM, SRAM etc. The capacity of each memory is explained in detail. Flash Memory has 32KB capacity. It has an address of 15 bits. It is a Programmable Read Only Memory (ROM). It is nonvolatile memory. SRAM stands for Static Random-Access Memory. It is a volatile memory i.e data will be removed after removing the power supply.

ATmega328 MCUs execute powerful instructions in a single clock cycle, allowing the device to achieve throughputs approaching 1 MIPS per MHz while balancing power consumption and processing speed. These Microchip MCUs are designed for use in industrial automation and home and building automation. EEPROM stands for Electrically Erasable Programmable Read Only Memory. It has a long-term data.

IV.G LCD

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.
The reasons being: LCDs are economical, Easily programmable, Have no limitation of displaying special characters.

FIGURE 7.LCD Display

The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like Initializing it, Clearing its screen, Setting the cursor position, Controlling display & etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

V. SOFTWARE REQUIRED

Arduino IDE

The Arduino Integrated Development Environment-or Arduino Software (IDE)-includes a text editor for code writing, a message area, a text screen, a toolbar with specific function buttons and a set of menus. It binds to and interacts with Arduino and Genuino Hardware to upload programs.

VI. RESULTS AND DISCUSSION

Once press the button is able to send message and the location of the device could be tracked with the help of Google maps API.

FIGURE 8. Final connection

FIGURE 9. GPS Location of user

FIGURE 10. Implementation

VII. ADVANTAGES

GPS tracking feature tracks the user lively when you are the move after triggering the emergency button. When the battery is running low, it automatically sends the location the pre-stored contacts. Easy to identify the culprit

VIII. CONCLUSION

The hardware and software components along with the working of the security assistance device are presented here. The prototype is able to send message and the location of the device could be tracked with the help of Google maps API. The developed system demonstrates how the device can be helpful to women in distress to call for help and, the law enforcers to help them in real-time. The system can provide cost-efficient device and also can be globally operated once enhanced.

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