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Category: Research Paper Child Safety Device

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Abstract: ***The proposed emergency package tool is programmed using the Arduino Integrated Development Environment (IDE) and the C programming language. This allows for a user-friendly and efficient programming platform for the device. The purpose of the tool is to provide a sense of security and quick response in emergency situations. When the emergency key is pressed, the device is activated and sends out an alert to the designated recipients via SMS, along with the person's current location. This information is determined through the GPS module, which provides real-time location tracking. The SIM800L GSM module is used to send and receive SMS and GPRS data, ensuring reliable communication in emergency situations. The OLED display serves as a display panel for the device, providing important information such as the battery level and GPS signal strength. This allows the user to easily monitor the status of the device and make necessary adjustments if needed. The OLED display also provides clear and crisp displays, which is crucial in emergency situations when quick access to information is necessary. Additionally, it is energy-efficient, making it an ideal choice for a portable device.***

Keywords: Arduino nano, GSM MODULE with GPRS Antenna ,GPS module ,OLED Display

1. Introduction

The development of a tool designed to provide help and support in emergency situations is crucial for ensuring the safety of individuals. The proposed tool is equipped with an array of advanced features that can be controlled and activated by pressing an emergency key. This tool is powered by an Arduino Nano board, which acts as the main controller and is responsible for coordinating the different components that make up the device. In this article, we will delve into the details of this tool and understand its various components, functions, and working mechanisms.

The emergency key is the central component of the tool and acts as the trigger mechanism for sending alerts in emergency situations. When the key is pressed, the device activates and sends an alert along with the person's current location to designated recipients via SMS. The location of the person is determined by the GPS location module, which is capable of providing real-time location data. The SIM800L GSM module is then used to send this information over the cellular network in the form of SMS or GPRS data. This ensures that the alert and location information is received by the designated recipients even in cases where the person is unable to speak.

The OLED display is an important part of the tool and serves as an interface between the user and the device. The display provides information on the current status of the tool, including the battery level, signal strength, and the status of the emergency alert. This helps the user to stay informed and ensure that the device is functioning correctly.

The Arduino Nano board is programmed using the Arduino Integrated Development Environment (IDE) and uses the C programming language. This makes the device user-friendly and easy to customize for different requirements. The device is powered by a rechargeable battery, which ensures that it is always ready for use. In addition, the device also includes a stun current for self-defense purposes, providing an added layer of protection for the user in emergency situations.

In conclusion, the proposed tool for an emergency package is a well-designed and versatile device that provides a quick and reliable solution for individuals in emergency situations. Its compact size and lightweight design make it easy to carry and its advanced features ensure that the user is always connected and protected. This tool is a crucial step in ensuring the safety and security of individuals, and its development will provide peace of mind in emergency situations.

2. Literature Survey

The World-wide Function Engine (GPS) is primarily based on the use of the RSSI technique [1]. This paper suggests that GPS generation facilitates accurate functional determination in children. A data set is extracted from the received character performance indicator (RSSI) from the Bluetooth connection. This is used to find the space between the character and the child.

The alarm sounds while the character and the child are some distance away from each other for safe reach. The remote video surveillance system is based on embedded Linux and GPRS [2]. This video tracking engine is primarily based entirely on embedded Linux and the GPRS (General Packet Radio Service) community. Lo hardware uses ARM9 S3C2410 processor for centralization and differentiates SDRAM, USB, GPRS modules, etc. The main features found via C programming are real-time digital camera record acquisition, image compression, and community transmission through the GPRS module. After

connecting to the terminal, the surveillance center receives the image recording and presentation. Using it on a home window isn't too difficult. The image dataset can be sent to the tracking center in 3-6 seconds after JPEG compression. Child safety and school bus tracking solutions [3]. School bus tracking is a key factor in limiting breakdowns. In this paper, we propose an embedded machine dedicated to child protection and school bus monitoring. It additionally provides using GPS longitude and altitude positioning and sending recordings via SMS. Each scholarship holder has an RFID tag on their personal smart card. This helps identify scholarship holders. Use two IR sensors to test whether students arrive or leave the bus. That's why I proposed "LPC 2148", which is mainly based on fully embedded machines. This is the perfect option for child protection and school bus monitoring. IoT is primarily based on school bus tracking systems [4]. In this mission, help moms and dads fill their children's space in real time by recommending her completely Android-based answers. An area's active RFID module is used in time to music, and a biometric ID embedded in the machine is used to identify the child. When the child gets on the bus, the biometric ID is captured on the bus and the machine selects and replaces the child. When the child is online, the server will send a notification to the father and mother containing the current location and time. Parents can see the bus area and be notified while their child is getting on and off the bus. Smart IOT devices for child safety and location [5]. Evolving the machine is the use of a Link It ONE board programmed in embedded C and connected to temperature, heart rate, contact sensors, and additional her GPS, GSM, and virtual digital digicam modules. The novelty of the painting is that the machine mechanically signals the character/caretaker via her SMS, while the child needs immediate attention in an emergency.

3. Objective

The objective of the child safety device is to provide a compact and portable tool that can be carried by a person in case of an emergency. The device is designed to work by using an Arduino Nano board, an emergency key, a GPS location module, a SIM800L GSM module, and an OLED display. The emergency key is linked to the Arduino Nano and when pressed, it triggers the device to send an alert and the current location of the person to the designated recipients via SMS. The GPS location module is used to determine the real-time location of the person, while theSIM800L GSM module is used to send and receive SMS and GPRS data. The OLED display shows information about the device's current status. The tool is programmed using the Arduino IDE and the C programming language. The device can be attached to the child's bag or clothing and it uses GPS technology to determine the child's location. This information can be accessed by the parents or guardians through their smartphones.

4. Methodology

The proposed tool will construct a circuit(an emergency package) which could without difficulty be carried through the victim, the use of which vicinity monitoring in addition to alert may be issued every time and anyplace required. Main additives used are Arduino Nano interface with GSM and GPS module for sending messages and getting the vicinity coordinates respectively. So, the individual related to the tool can make certain protection, through switching the circuit on.

Hardware Components: -

a) Arduino Nano :-
The Arduino Uno is an open-supply microcontroller board primarily based totally at the Microchip atmega328p microcontroller and evolved through A. The board is geared up with units of virtual and analog input/output (I/O) pins that can be interfaced to numerous enlargement boards (shields) and different circuits. The board has 14 virtual I/O pins with six able to PWM output, 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), through a kind B USB cable. It may be powered through the USB cable or through an outside 9-volt battery, aleven though it accepts voltages among 7 and 20 volts.

b) Emergency Key:
The emergency secret's related to the kid. If they sense insecure simply press emergency key. Once the secret's pressed the vicinity is despatched to the dad and mom. This enables the dad and mom to discover the kids and rescue them if it's far necessary. When this secret's pressed GSM transmits the vicinity to the dad and mom through GPS module.

c) GPS Location module:
For figuring out the actual time vicinity of the kid NEO6M GPS module has been used which communicates with the Arduino Uno via a 9600-bps software program serial interface. The connections among the Arduino Uno and the GPS module is made. This gadget famous a totally low electricity intake and really compact in size. The GPS module output incorporates of trendy string statistics that's ruled through the National Marine Electronics Association (NMEA) protocol. Short Message service (SMS) triggers textual content "LOCATION" and is transmitted from the cellular telecellsmartphone of the user. Upon transmission, this newsletter is recounted through the GSM. This textual content similarly activates the Arduino Uno for execution and therefore Arduino Uno runs the GPS code and gathers the present, current, and correct vicinity of the GPS module. The following codecs are the vicinity output acquired from the GPS module.

d) SIM800L GSM Module:
SIM800L GSM module is a miniature mobile GSM modem from Simcom, which could without difficulty interface with any microcontroller to offer themicrocontroller GSM functionality, and permits for GPRS transmission. This module connects the microcontroller to the cellular community to make or acquire telecall smartphone calls, ship or acquire SMS (textual content messages), and hook up with the net the use of GPRS, TCP, or IP. Another gain is It helps quad-band GSM/GPRS community, because of this that it is able to paintings everywhere withinside the world. These essential functionalities in addition to the low fee and small footprint make this module greater ideal for

any challenge wherein long-variety connectivity is required.

On the pinnacle floor of the GSM module, we are able to see a chip is set up at the module board. This is a Quad-band SIM800L GSM/GPRS mobile chip from SimCom in SMT kind. SIM800L helps Quad-band frequency its works on frequencies 850MHz, 900MHz, 1800MHz, and 1900MHz, it is able to transmit and acquire voice, SMS, and information statistics with low electricity intake. The working voltage of this chip is from 3.4V to 4.4V which makes it perfect to perform through a LiPo battery supply. This chip helps a baud price from 1200bps to 115200bps with Auto-Baud detection.

e) OLED DISPLAY:
A natural mild-emitting diode, additionally called natural electroluminescent diode, is a mild-emitting diode wherein the emissive electroluminescent layer is a movie of natural compound that emits mild in reaction to an electric powered current.

This 0.96-inch (1x1) inch show makes this one in every of our smaller versions; ideal for small projects, wearables, and different portables. You can view its crispy blue photos from a wide, 160-diploma perspective variety. And it has a low, low 0.06W electricity intake in ordinary running conditions. Extreme temperatures are even no fit for this module which could perform in -30 to 70 diploma C temperatures.

Software Components
Arduino IDE: The proposed tool is largely a controller-primarily based totally emergency package which fits while pre-programmed commands manual a route accordingly. Since for control in addition to controlling the utility a “c language” code has been delivered to controller the use of arduino IDE (incorporated improvement environment).

5. Circuit Diagram

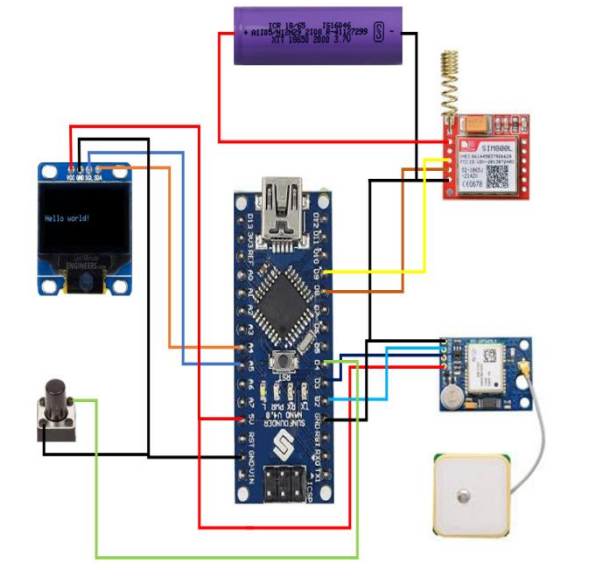

Figure: Overview of Child safety device

6. Working

The development of a tool designed to provide protection and real-time notifications in emergency situations is crucial for ensuring the safety of individuals. In an emergency situation, every second counts, and it is essential to have a reliable solution that provides quick and accurate information to the designated recipients. The proposed tool is a state-of-the-art device that offers a comprehensive solution for individuals in emergency situations, providing both protection and peace of mind.

The emergency button is the centerpiece of the tool and acts as the trigger mechanism for sending alerts in emergency situations. As soon as the button is pressed, the device activates and starts sending signals to the other components, which then work together to provide real-time information on the person's location and status. The emergency button is immediately linked to the atmega328 controller of the Arduino Nano board, which acts as the main controller and is responsible for coordinating the different components that make up the device.

The GPS module is an essential component of the tool and provides real-time location data. The module determines the coordinates of the person's location, which are then transmitted to the designated recipients via SMS. The transmission of location data is performed using AT commands and the SIM800L GSM module, which is used to send and receive SMS and GPRS data. The real-time location data is crucial for ensuring that the designated recipients are informed of the person's location, even if they are unable to speak.

The OLED display is an important part of the tool and serves as an interface between the user and the device. The display provides real-time information on the current status of the tool, including the battery level, signal strength, and the status of the emergency alert. This helps the user to stay informed and ensures that the device is functioning correctly. In addition, the display also provides feedback on the status of the emergency alert, allowing the user to confirm that the alert has been sent and received.

The Arduino Nano board is programmed using the Arduino Integrated Development Environment (IDE) and uses the C programming language. This makes the device user-friendly and easy to customize for different requirements. The device is powered by a rechargeable battery, which ensures that it is always ready for use. In addition, the device also includes a stun current for self-defense purposes, providing an added layer of protection for the user in emergency situations. The stun current is capable of emitting 2400V of electric shock, providing a non-lethal method of self-defense in emergency situations.

In conclusion, the proposed tool for an emergency package is a well-designed and versatile device that provides a quick and reliable solution for individuals in emergency situations. Its compact size and lightweight design make it easy to carry and its advanced features ensure that the user is always connected and protected. The tool provides real-time information on the person's location and status,

ensuring that the designated recipients are informed and can take the necessary actions to provide help and support. The stun current provides an added layer of protection for the user in emergency situations, providing peace of mind in potentially dangerous situations. The development of this tool is a crucial step in ensuring the safety and security of individuals, and its widespread use will provide peace of mind in emergency situations.The main objectives of an Arduino-based child safety device that utilizes GPS and GSM technology are Real-time Location Tracking The device should be able to accurately track the child's location in real-time using GPS technology and provide this information to the authorized person.

7. Result

The child safety device described appears to be a well-designed and efficient tool that could provide a sense of security and quick response in emergency situations. The device is powered by an Arduino Nano board and includes a GPS module, a SIM800L GSM module, and an OLED display, which allow it to send out an alert with the person's location when an emergency key is pressed. Overall, the development of this tool is a crucial step in ensuring the safety and security of individuals, particularly children, in emergency situations, and could be an important tool for parents, caregivers, and emergency responders a like.

8. Conclusion

The proposed emergency package tool is a well-designed and efficient device that provides a sense of security and quick response in emergency situations. The tool is powered by an Arduino Nano board and includes a GPS module, a SIM800L GSM module, and an OLED display. When the emergency key is pressed, the device sends out an alert to designated recipients via SMS, along with the person's current location. The OLED display provides important information on the device's status, including the battery level and GPS signal strength. The tool is easy to program and customize using the Arduino IDE and C programming language, and its compact size and energy efficiency make it an ideal choice for a portable device. Overall, the development of this tool is a crucial step in ensuring the safety and security of individuals in emergency situations.

9. Future Scope

The child safety wearable system acts as a smart device. Child's surroundings can be located with thehelp of accurate and precise real- time position. girding terrain temperature, SOS light along with torture buzzers are handed in this system. This helps inlocating their child. This also aids theonlookers to deliver the child. The smart child safety wearable can be boosted vastly in the future by using extremely squeezed Arduino modules like Lily Pad Arduino which can beexaggerated into fabrics. Also as a unborn compass, further power effective model can be created that holdsthe battery for a longer time.

Conclusion:

The proposed emergency package is a compact and portable tool that can be carried by a person in case of an emergency situation. It combines the power of Arduino, GPS, and GSM technology to provide real-time location information and send alerts to designated recipients in case of emergency. The OLED display shows information about the device status and the stun current can be used for self-defense purposes. The device is easy to use and can be programmed using the Arduino IDE and C programming language.

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