International Journal on Science and Technology (IJSAT)
E-ISSN: 2229-7677 ● Website: www.ijsat.org ● Email: editor@ijsat.org

A Smart Women Safety Bag with Gsm Technology

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Abstract:
This work presents a simple safety setup placed inside a handbag to assist the user during emergency situations. The idea was tested by combining a few basic sensors with a communication module instead of relying on a single triggering method. During operation, the system keeps checking movement and physical pressure conditions while also allowing manual activation through a switch. When any unusual condition is noticed, the controller collects location data from the GPS unit and sends it to selected contacts using a GSM module. In parallel, a buzzer is turned on so that nearby people can notice something is wrong. While testing, it was observed that message delivery depends slightly on network strength, but alerts were still successfully transmitted in most cases. The setup was kept compact so it could be carried easily without affecting normal use of the bag. The overall focus was on making the response quick rather than adding too many features.

Keywords: Arduino UNO, GSM, safety bag, buzzer, GPS, push button, flex sensor, mems sensor.

INTRODUCTION

Women have long put their security above all else. Women revel in instability within and outdoor their households. In many elements of India, girls are afraid to go out in the night-time due to dwelling conditions. More and extra ladies are working in business and IT businesses and their variety is growing. Women have to paintings day and night as consistent with their need. As a result, there's a lack of transportation alternatives like buses and taxis that are uncommon and regularly expensive in rural regions. This makes it difficult for women to walk home. The proposed tool is an emergency protection device. It is small, flexible and compact with many capabilities. The fundamental layout of this gadget is to spotlight the emergency variety listed on the woman's present day home.

Messages are sent using a GSM modem to a pre-arranged smartphone quantity and a GPS machine is used to song the victim's modern area. This haircut is suitable for the elderly and younger kids. In this article, we are able to show you the plan of a smart bundle that continues women safe. The smart backpack consists of a voice sensor, an Arduino board, a GSM module, an emergency switch, and many actuators. The gadget is turned on through urgent the emergency transfer or detecting the woman's voice the usage of the voice sensor. When an alarm scenario is detected, the alarm emits an excessive-pitched, stable sound, a noticeably focused mild starts to flash, and pepper spray rains down. In addition, an exceptionally high anxiety is generated on the front of the bag that can harm the attacker. At the equal time, a message indicating the place and situations is mechanically sent from registered phones.

LITERATURE SURVEY:

Writing an evaluation is a virtually important step inside the product development system. Before developing a machine of its calibre, the decisive elements are the selection of brief components, the supply of finances, and the energy of the marketing strategy. After these are met, the next stage is to determine which language and helpful tool can be utilized to expand the machine. Programmers will need a lot of outside assistance when they begin developing the tool. You can get this assistance from websites, books, or seasoned software developers. The above-stated troubles are considered earlier than designing a gadget to optimize the proposed tool.

The important duty of the paintings development branch is to very well examine and compare all the paintings improvement requirements. The literature review is the most important phase in the software program development process for every project. Duration factors, belongings requirements, labour, financial problems, and power need to be analyzed and studied earlier than the development of the gadgets and the related design. After those parts are finished and studied thoroughly, the product program specs for the precise PC, the predicted running engine for the project, and any product application ought to be evolved. Step through step to improve their competencies and tools

We plan to create a tool that connects diverse gadgets. The hardware includes a lovely wearable bracelet that continuously communicates with a telephone thru the net. The app is modified and is full of all of the crucial statistics without delay associated with someone and their reactions to diverse conditions together with fear, tension and trauma. It transmits the sign sent from the cell smartphone. The object or application accesses GPS and communications in order that every time it gets an emergency signal, it may send help to the closest police station, family contributors and those who've the app with nearby busy space topics. This movement triggers speedy assist from nearby citizens and police, who can reach the crime scene with exceptional accuracy [1]. This venture provides an Arduino-based wearable protection tool for ladies. The motivation in the back of this gadget is to guard girls in case of any risk. The device communicates with them and sends them indicators via a community of wireless sensors. GPS and GSM are used for facts transfer to percentage the customer's location directly with applicable specialists and registered contacts. A activate the device sends guide alarms whilst a seizure happens, and while the surprise charge changes, the signal is likewise activated by way of a laser diode [2].

Our idea in this text is a wearable tool that improves women's safety. This is carried out via gaining knowledge of the purchaser's coronary heart price and oxygen estimates and updating them on an IoT internet server. The consumer's coronary heart rate and blood oxygen are not set in stone by using acquiring approximate pulse and oxygen readings from a pulse oximeter and oxygen sensor positioned on the coronary heart of the system. Sending sensor statistics to the Blink IoT net server allows real-time tracking of the person's facts. This remote device is absolutely acceptable to constantly reveal the purchaser's heart price and oxygen readings and reply in a risky state of affairs. It does this by using detecting odd heart price and oxygen readings, then sending an instant message to the sitter's cellular cell phone via the Tasker app with the region and live video prepared. At the same time, the alarm goes off. In addition, we validate our structure design the use of numerous sorts of continuous checking out. Furthermore, we examine our proposed architecture with the present structure [3].

This article presents a brief comparison of latest developments in the discipline of battery-unfastened close to-subject conversation (NFC) sensors and other quick-variety RFID technologies. After reading NFC-based totally power transfer, sensible improvement of NFC-based NFC tags and readers is suggested. In addition, a listing of commercially available NFC included circuits for power harvesting is provided.

Finally, evaluate of the superior developments in NFC-primarily based sensors is furnished, displaying that a big wide variety of sensors (each hardware and bodily) can be used with this innovation. There is a developing interest in wearable sensors and bloodless chain tracking applications. The availability of low-cost gadgets and the inclusion of NFC readers in maximum present day mobile telephones make NFC technology critical for growing green Internet of Things (IoT) applications [4]. Suggest a manner to apply Raspberry Pi with sound sensor, digital digicam module, GPS and GSM to create wearable IoT devices. The SVM (Support Vector Machine) tool popularity algorithm predicts the victim's cry, whilst the sound sensor detects screams. After predicting the sufferer's screams, the device quickly activates the digital digicam module that takes 30-2nd pix. Using the GSM module, it tracks the GPS vicinity and sends an alert message and an emergency call to the closest police station. In the second one case, while the sufferer presses the published, the virtual digicam module is right away activated and sends a 30-2d video. When the GPS is activated, the GSM sends a caution message with a recognition. The primary aim is to offer girls with a totally handy and realistic smart tool. The first and maximum vital difference is the possibility of decreasing the scale of the bracelet gadgets in comparison to different existing clinical devices [5].

The configuration is controlled by means of the Raspberry Pi and has wonderful modes: ordinary mode and protection mode. In security mode, the fingerprint sensor acts as a panic button and if a fingerprint is recognized, the device statistics the location, takes a photo of the intruder and stores it inside the cloud. In ordinary mode, the consumer can verify their fingerprint. In protection mode, the fingerprint sensor does the identical. AI calculation takes the client's place as statistics and estimates the covered area closest to the vicinity [6].

New ideas are born each day in the international of intelligence. Human intelligence is developing hastily, however keeping safety inside the face of ever-changing generation is a undertaking. Because security qualifications are much less effective, but they're extra open within the place of job. In addition, the nicely-being of this fragile information is very critical for safety and new traits had been evolved to defend facts at a higher degree. Innovation on this regard is shifting towards IoT-based totally innovation. The future Internet of Things (IoT) will join many normal additives thru a network. The simple concept of the Internet of Things (IoT) is to collect and percentage statistics in it by tracking and gathering sensor records [7].

In this paintings, we endorse a innovative version for an IoT-primarily based healthcare infrastructure capable of far flung screening and affected person characterization. To help our research, we talk requirements, protocols, and technology based at the paintings geared toward developing IoT packages associated with healthcare. The proposed structure is primarily based on a hard and fast of low-power, non-invasive sensors attached to the bodies and beds of sufferers. These sensors include facts collection nodes connected to a clever gateway that collects statistics. Through digital health file (EHR) exchange, the smart gateway integrates with the prevailing information device of the sanatorium. It permits healthcare experts to easily access relevant affected person data in contexts they are familiar with. The proposed framework is primarily based on Bluetooth Low Energy (BLE) generation at the information receiving layer, Message Queue Telemetry Transport (MQTT) protocol on the internal layer, and Rapid Healthcare Interoperability Resources (FHIR) at the top layer. A use case is supplied to deal with functional and non-practical necessities and offer a higher expertise of the relationship and communication between man or woman entities [8].

Women are afraid to depart their homes each day due to diverse threats consisting of kidnapping, assault, rape, and abuse. This article will display you the way to create a wearable protection tool for ladies the usage of an Arduino microcontroller. The intention of the exploratory research is to guard girls in danger.

The module communicates with at ease networks and provides IoT-based alerts. The gadget is configured to carry out a calculation whilst sensor readings exceed threshold values. The fundamental purpose of the proposed gadgets is to ensure the safety of ladies around the world. Therefore, the tool uses current advances inclusive of the Web of Things (IOT) and GPS modules, used to transmit the client's area to suitable professionals and stored contacts with GSM [9].

The intention of this undertaking is to expand a safety device for ladies that lets in for fast response and reporting. This software allows ladies conquer their fear and speak to their caregiver for assist. It will assist you to recognise what's happening with the aid of pressing the button on your clever bracelet. The exclusive sensors included inside the bracelet have made our assignment a clever bracelet able to protecting ladies. When she wears the bracelet or watch, if she is threatened or threatened by means of the alternative birthday celebration, she will be able to press the watch button while she falls, numerous facts consisting of area, frame posture, coronary heart fee and a Raspberry Pi may use GSM to send SMS alerts to a predetermined wide range of recipients. You can use GPS to find the victim's exact location. It will provide the police with the victim's longitude and range, enabling them to quickly ascertain the sufferers, save you the incident, protect girls and punish the culprit. Through the primary level of IoT, girls' statistics may be monitored remotely. This will assist lessen the range of crimes against girls [10].

EXISTING SYSTEM

They used NFC Communication in the existing system. Furthermore, they utilized radio frequency technology. They will be able to recharge the battery, which is powered by solar panels. Furthermore, utilized Arduino microcontroller as dynamic regulator.

DISADVANTAGES

- The Arduino UNO has lesser memory and processor capacity when contrasted with Hub MCU. No implicit IoT capacity. More expensive: The Node MCU is less expensive than the Arduino UNO.
- Implementing solar batteries requires more time and money.
- There is a lack of efficiency, and messages cannot always be sent to the registered number.

PROPOSED METHOD

The system was arranged as a small unit and placed inside a regular handbag for testing. Instead of designing it around one condition, multiple inputs were considered so that false triggering could be reduced to some extent. A NodeMCU board was used to connect all components. It keeps reading values from the sensors at regular intervals. The motion sensor showed noticeable variation when the bag was shaken or moved suddenly. At the same time, the flex sensor responded when pressure was applied, especially when the bag was pressed or slightly bent. These two readings together gave better indication compared to using only one sensor. A push button was also included during implementation. This was useful because in some situations the sensors did not show large variation, but manual triggering worked immediately without delay. Once a trigger condition was met, the controller first tried to obtain GPS data. In open areas, location was received faster, while in indoor conditions there was a small delay. After getting coordinates, the GSM module sent a message to stored numbers. The message contained only location details to keep it short. A buzzer was activated at the same time. It was loud enough to be heard within a short distance during testing. Power was supplied using a small battery, and a regulator was added

to avoid unstable output. Overall, the system worked as expected, though performance depended slightly on signal availability.

BLOCK DIAGRAM:

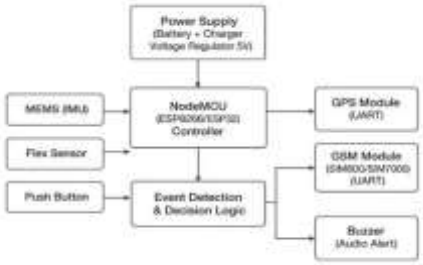

FIG: 1 BLOCK DIAGRAM

SYSTEM REQUIREMENTS
HARDWARE COMPONENTS

- POWER SUPPLY
- NODE MCU
- FLEX SENSOR
- MEMS SENSOR
- PUSH BUTTON
- GSM
- GPS
- BUZZER

SOFTWARE COMPONENTS:

- ARDUINO UNO
- EMBEDDED C

NODEMCU

FIG: 2 NODEMCU

The NodeMCU was used as the main controller in this setup. It handled both input reading and output control. During testing, it was able to read sensor values without noticeable delay. It continuously checked whether the values were within normal range before taking any action.

ACCELEROMETER

FIG: 3 MEMS SENSOR

The accelerometer readings changed clearly when the bag was moved suddenly. Under normal handling, the values stayed within a small range, but shaking or jerks caused visible variation. These changes were used as one of the conditions for triggering the system.

FLEX SENSOR

FIG: 4 FLEX SENSOR

The flex sensor responded when pressure was applied to the bag. It did not show large variation for small bends, but when force increased, the change was easier to detect. This helped in identifying situations where the bag was being handled roughly.

PUSH BUTTON

FIG: 5 PUSH BUTTON

A push button was added mainly for reliability. During testing, this turned out to be one of the fastest ways to trigger the system since it does not depend on sensor readings. A single press directly activated the alert process.

GPS MODULE

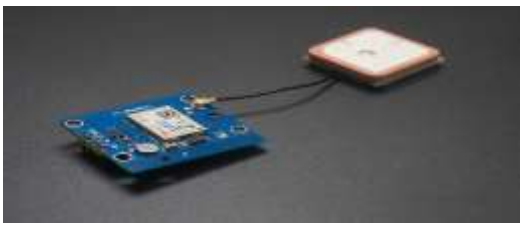

FIG: 6GPS MODULE

The GPS module was able to provide location data, but the time taken depended on surroundings. It worked faster in open spaces. In indoor conditions, there was some delay before coordinates were available.

GSM MODULE

FIG: 7GSM MODULE

The GSM module was used to send alert messages. Message delivery was mostly successful, although slight delay was noticed when signal strength was low. Still, the message reached the stored contacts in testing.

BUZZER

FIG: 8BUZZER

The buzzer produced a clear sound when triggered. It was not very loud over long distances, but it was enough to be noticed nearby.

POWER SUPPLY

FIG: 9POWER SUPPLY

A battery source was used along with a voltage regulator. Without regulation, small fluctuations were observed, so adding the regulator helped in maintaining stable operation.

RESULT AND DISCUSSIONS:

The system was tested under different conditions to check how it responds to movement, pressure, and manual triggering. Initial testing was done in a controlled indoor environment, followed by a few trials in open areas to observe GPS and GSM performance. When the bag was moved normally, such as during walking, the accelerometer values remained within a limited range and did not trigger any alert. However, when sudden jerks or shaking were introduced, the readings changed noticeably and the system was able to detect it as an abnormal condition. It was also observed that very small movements did not affect the system, which helped in avoiding unnecessary alerts. The flex sensor showed gradual variation when pressure was applied. Light bending did not always cross the threshold, but stronger force resulted in clear changes, which were picked up by the controller. In a few cases, combining both motion and pressure conditions gave a more reliable trigger compared to using a single sensor alone. The push button worked consistently in all trials. It triggered the alert immediately without depending on any other condition, making it the most reliable input during testing. GPS performance varied based on the surroundings. In open areas, location data was obtained within a short time, whereas indoors it took longer to lock onto signals. In some indoor trials, there was a delay of a few seconds before coordinates were available. Despite this, once the location was acquired, it was accurate enough for tracking. The GSM module was able to send messages successfully in most cases. A slight delay was noticed when the signal strength was low, but the message was still delivered. Keeping the message content short helped in faster transmission. The buzzer produced an audible alert whenever the system was triggered. It was clearly noticeable within a nearby range, although it may not be effective over longer distances or in noisy environments. Overall, the system performed as expected during testing. Some limitations were observed, mainly related to GPS delay in indoor conditions and dependence on network availability for message delivery. Even with these factors, the setup was able to provide timely alerts in most situations, which shows its practical usefulness.

Conclusion:

The developed system was able to detect unusual conditions and send alerts within a reasonable time during testing. Both automatic sensing and manual triggering worked as expected, with the push button giving the quickest response. Some delay was noticed in GPS signal acquisition indoors and in message delivery under weak network conditions, but overall functionality remained stable. The setup is simple and can be carried easily without affecting regular use. In future, the system can be improved by using faster GPS modules, adding a mobile app interface, and including features like live tracking or audio recording. Enhancing power efficiency and reducing response delay can further improve performance.

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