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Application of Smart Bag Using Arduino

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Abstract: ***In our day-after-day life traveling has become one of the necessary aspects of a person's being. usually for traveling purpose individuals uses normal traditional bags or luggage however in today's world such sort of bag doesn't seem to be safe for the security purpose of reading. With the speedy advancement of technology within smartphones, laptops, and many similar devices, our dependency on them has drastically become hyperbolic. Traveling persons are facing several safety issues for luggage today. Thus, they feel unfit in such cases and want facilities to shield themselves. All electronic inventions aim to reduce the manual effort required for mechanical tasks and establish a seamless interaction between humans and machines. Here we tend to introduce a device that ensures the protection of baggage in a bag. The micro-controller, which is the brain of the system, will manage all the distinctive features of the projected system. Additionally, the solar panel located on the front part of the bag can be used to charge electronic devices such as mobile phones, laptops, and power banks. RFID automation is automated to solve the forgetting fullness to pack the desired things. A bag tracking system can inform you wherever your bag is and wherever it's been, however long it has been. Ultrasonic sensors area unit accustomed to creating a human following system to create a bag that follows its owner. The system uses geographic position and time data from the GPS Module which can track the bag employing a Mobile application. During this bag at intervals a little platform, all the facilities area unit enforced along expeditiously. So, the Smart bag is associated application-specific specific type that may be helpful for pretty much everybody in society.***

Keywords: GPS, GSM, Ultrasonic sensors, RFID

I. INTRODUCTION

In today's fast-paced and intelligent world, objects and devices must also be fast and efficient to keep up with the pace of daily life. Nowadays everyone uses a Smart Phone. From communication options to online booking or price tag reservations, everything maybe done using Smart Phones. However, its frequent usage discharges the mobile battery a lot of usually. Additionally, once these mobile ages, it's ascertained that the battery discharges frequently and requires charging in brief intervals. To beat this drawback, several good Smart Phone users, get power banks and even have to be charged one by one each day. Therefore,solar power is a great solution to the problem of frequent battery discharging in smartphones. With the advancements in technology, many devices and applications now utilize solar power as an alternative energy source. Solar energy is a renewable and clean energy source that is readily available, and can be used to charge electronic devices even while on the go. Our paper intends to seem into introducing the access safety of bags through a tracking system by GPS that may facilitate bag transportation during a secure and safer means. Principally Bag tracking systems are supported by GPS and GSM. Short Electronic Messaging Service (SMS) may be a feature obtainable on all mobile phones that permits a little quantity of text to be sent between one user and another. There's a necessity for a system that may indicate in real time that the stealing is taking place and produce an alarm to scare the criminal and additionally create close folks note of such incidence. This may be enforced using an Anti- Theft Detection system which uses ultrasonic sensors and can be unbroken within the bag. If the connectivity between the mobile and also the ultrasonic sensor is lost, an alarm system is going to be activated to point to the stealing of the mobile. The mobile is retrieved by obtaining its location with the assistance of another person's phone. To simplify the tedious packing process, there is a need for an application that utilizes RFID technology. Each item is tagged with a unique identification, and the information about all the items packed in the bag is stored in the microcontroller.

II. LITERATURE SURVEY

A. Fingerprint Protection System

Fingerprint recognition technology, as described in this paper, enables access only to those individuals whose fingerprints have been previously stored in its memory. The stored fingerprints remain accessible even in the event of a power outage or battery drain. This eliminates the need for keeping track of keys or remembering a combination password or PIN. The lock can only be unlocked when a certified user is present because there are no keys or combinations to be derived or stolen, and no locks that can be picked. Thus, fingerprint-based locks offer an excellent solution to the inconvenience that is commonly encountered with traditional locks.

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B. Smart Bag with stealing interface and time period Tracking

This paper presents a smart bag tracking system that utilizes the Global System for Mobile Communication (GSM) and Global Positioning System (GPS) technologies. The bag is equipped with a fingerprint-locking system for enhanced security. Additionally, ultrasonic sensors are employed to detect nearby objects, thus preventing collisions. Two infrared (IR) sensors are used to enable the bag to follow its owner.

C. Auto Trailing Bag of the Smart Bag

1) *Object Detection using Ultrasonic Sensors:* To activate the bag, an SMS can be sent from a mobile device. Two ultrasonic sensors are utilized to detect human presence, and they are connected in a simple way such that the transmitter section of each sensor is placed in the middle, and the receiver section is placed on either side. The transmitter section emits sound waves continuously, which bounce back when they hit an obstacle. The movement of the bag, whether forward, right, or left, is determined by the signal strength received by each receiver section. An algorithm compares the readings from the two sensors and decides whether to turn left (if the left sensor returns the strongest signal), right (if the right sensor returns the strongest signal), or move forward (if the output of the two sensors is similar). If the distance between the bag and the human falls below a predefined threshold or if the range drops, the bag stops.
2) *Human Following Mechanism using 2 IR Sensors:* To enable the following mechanism, two IR sensors are utilized. On one edge of the bag, there are two receivers placed at each end and one transmitter placed in the center. This setup allows for the detection of left and right turns, as the two IR receivers placed at the corners of the bag capture the corresponding actions. The data captured by the IR receivers is then sent to the Arduino, and through programmed actions, the motors are directed to turn in a specific direction in order to follow the person.

III. PROPOSED METHOD

The planned system highlights the GPS (Global Positioning System) tracker, Auto-drive, and manual drive. This device facilitates communication between the user and the carrier, while also providing manual control over the carrier's movements.

As each object is placed inside the bag, the RFID reader reads the object's tag and saves its name in the system's database. If an object is accidentally left out of the bag, a list of missing items can be displayed on the bag's LCD screen. Additionally, the GPS module is used to track the bag's location. If the bag goes out of range of connected devices, a message is generated and sent to a registered phone number, which includes a link to the bag's location. Here we've got an inclination to use one technique that is implemented using data taken from ultrasonic and IR sensors. Ultrasonic sensor invariably measures the gap between the bag and also the bag can detect obstacles and prevent displacement through a proximity detection technique that involves sending sound waves and collecting microwaves. Additionally, the bag can be traced and located using GPS and GSM technology, allowing it to be easily found if lost.

This system also includes fingerprint protection, which ensures that the bag can only be opened when an authorized user is present. Since there are no keys or combinations that can be stolen or locks that can be picked, the fingerprint protection system provides an additional layer of security.

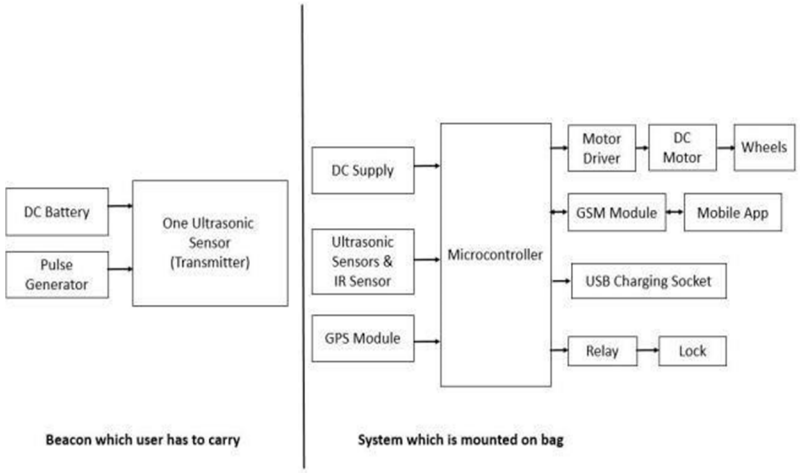

Fig -1: Block diagram of the Advance version of the smart bag

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IV. CONCLUSIONS AND FUTURE WORK

Yes, advancements in technology are constantly leading to new and innovative products like the solar energy-based Smart Bag. These products not only offer convenience but also have the potential to be more sustainable and environmentally friendly. It is exciting to see how technology is being utilized to solve real-world problems and improve our daily lives. As technology grows day by day, we will imagine the long run during which factors we tend to might occupy each place.

The bag provides security and higher options useful for handling the smart bag.

The biggest advantage of using GSM modem in this project is that whenever the switch is pressed, we can get the location information through the GSM network. This allows for real-time tracking of the bag, even when it is outside the range of other connected devices.

To our mobile numbers that are kept within the GSM network so that one will save the person who is in threat.

This paper's proposed solution takes advantage of smartphones, which offer numerous features such as Google Maps, GPS, SMS, and more. While some of the previous works have relied on SMS based tracking, which may not provide accurate location data, our planned system includes real-time tracking. Additionally, we have incorporated geofencing and emergency communication services to enhance the system's capabilities.

By implementing real-period applications and a device, we will solve the issue to an extent. With more analysis and innovation, this project is employed as a tiny low-wearable device like a sort of watch, pendant, etc.

In the future, we aim to include some attention-grabbing options like automatic object rejection, stairway climbing, and a few further women’s safety options. These further options create the bag with a lot of powerful and user-friendly systems interfaces with the camera for capturing images and recording live video also.

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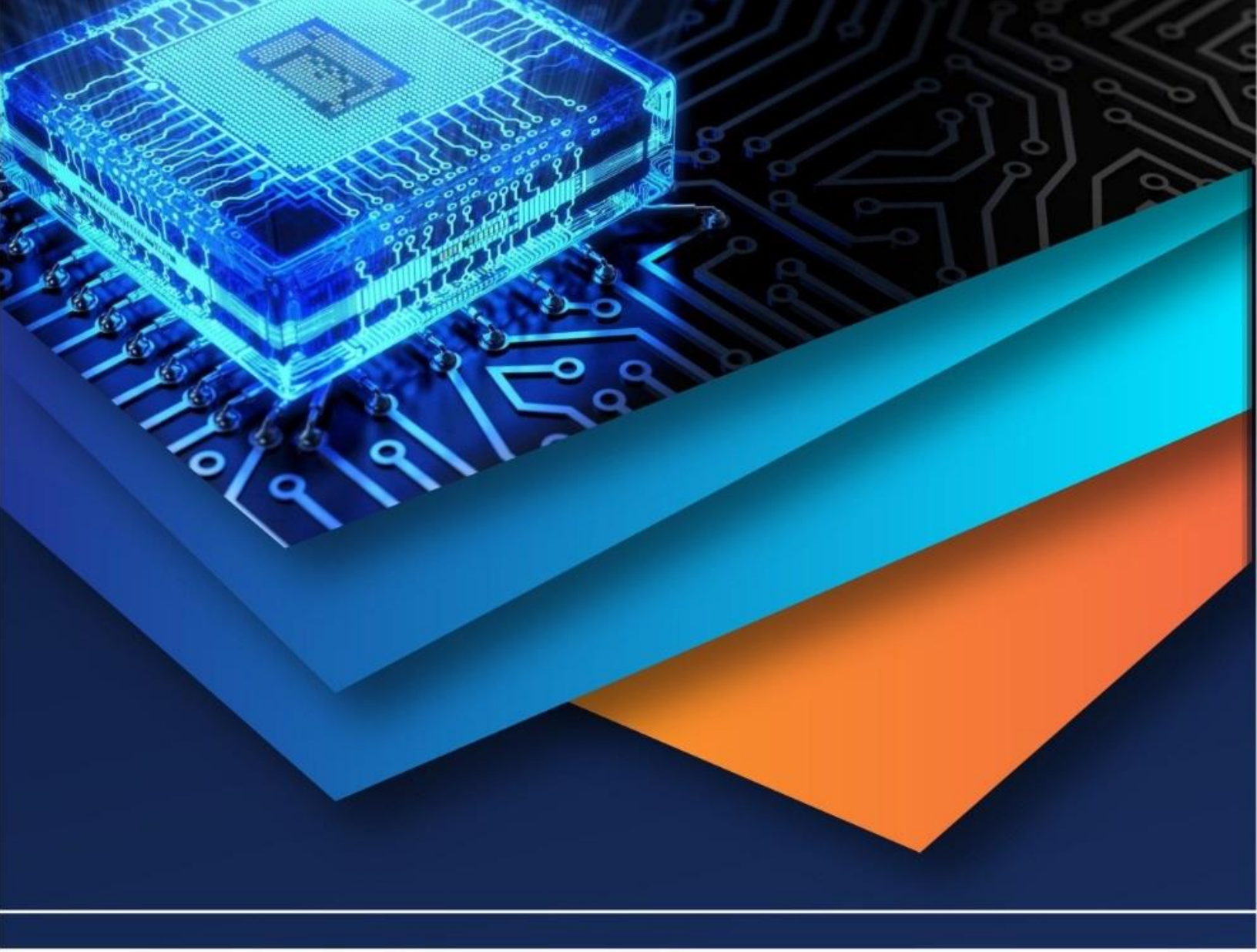

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