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CHILD SAFETY JACKET USING GSM AND GPS

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ABSTRACT

Child safety and tracking is of utmost importance as children are the most vulnerable. With increasing crime rates such as child kidnapping, child trafficking, child abuse and so on, the need for an advanced smart security system has become a necessity. With this motivation, a self-alerting "Child Safety Jacket using GSM and GPS" is developed to aid parents to monitor and track their children in real time as an alternate to stay beside them. This system is intended as an everyday wearable device on the child, in the form of a wrist band, hand glove, arm band or a belt.

The system is designed to continuously monitor the location and body vitals of children. This electronic system comprises of an Arduino controller, and sensors to detect the changes in parameters such as temperature, BVP (Blood Volume Pulse) or Heartbeat. The system also uses a GSM and GPS module. Decision Tree Classifier Algorithm is used to detect any distress situation with sensor values as inputs. The location of the victim is traced using the GPS module and is sent to the registered contact numbers as a text message using a GSM module. The novelty of this work lies in the autonomous decision making process with increased accuracy.

INTRODUCTION

The Implementation of IoT & SMS Based Smart Refrigerator project introduces a transformative approach to conventional refrigeration technology. By integrating IoT sensors and SMS-based communication, this project aims to enhance the functionality and convenience of household refrigerators. Through the utilization of temperature, humidity, and weight sensors, the smart refrigerator ensures precise monitoring and control of food storage conditions. Users can remotely access and manage the refrigerator's operations via a dedicated mobile application or SMS commands, offering unprecedented convenience. Automated alerts

notify users of any deviations from optimal conditions, promoting food safety and minimizing wastage.

The project emphasizes energy efficiency through intelligent algorithms, optimizing cooling cycles to reduce electricity consumption. By bridging the gap between traditional appliances and modern technology, the smart refrigerator exemplifies the potential of IoT in everyday life. Accessibility is ensured through Wi-Fi or Ethernet connectivity, enabling seamless integration into smart home ecosystems. Real-time data from IoT sensors enables proactive maintenance and troubleshooting, enhancing reliability. The project addresses key challenges in traditional refrigeration, such as manual monitoring and limited control. Through remote monitoring and management capabilities, users can optimize food storage and reduce their environmental footprint.
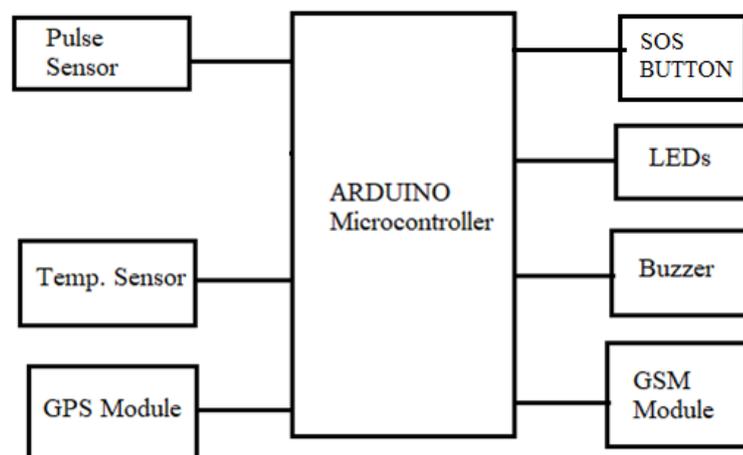

Figure.1 Block Diagram

LITERATURE SURVEY

Child safety jackets with integrated GSM and GPS technology have gained significant attention in recent years due to their potential to enhance child security and provide peace of mind to parents and guardians. These innovative jackets typically incorporate GSM modules for communication and GPS modules for real-time tracking, allowing parents to monitor their child's whereabouts remotely. In a literature survey of this technology, several studies highlight the importance of such devices in preventing child abduction, aiding in search and rescue operations, and improving overall child safety in crowded or unfamiliar environments.

Furthermore, literature in this field often discusses the role of GSM and GPS technology in enabling effective communication between the jacket and caregivers, as well as the importance

of user-friendly interfaces for parents to access tracking information easily. Studies have examined the accuracy and reliability of GPS tracking systems integrated into these jackets, as well as the responsiveness and coverage of GSM networks for communication purposes.

PROPOSED SYSTEM

A child safety jacket incorporating GSM (Global System for Mobile Communications) and GPS (Global Positioning System) circuits is a modern technological solution aimed at enhancing the safety of children, particularly in crowded or unfamiliar environments. The integration of GSM allows for real-time communication capabilities, enabling parents or guardians to remotely track and monitor the child's location through GPS technology. This jacket serves as a proactive measure to address concerns related to child safety by providing a means to quickly locate a child if they wander off or encounter a potentially dangerous situation.

At its core, the GSM circuit facilitates communication between the jacket and a designated smartphone or computer. Through this communication link, parents can receive updates on their child's whereabouts, ensuring peace of mind and enabling swift action in case of emergencies. Additionally, the GPS circuit accurately determines the child's location, utilizing signals from satellites to provide precise coordinates. By combining GSM and GPS technologies, the safety jacket offers comprehensive monitoring capabilities, allowing parents to remotely track their child's movements and respond promptly to any deviations from predefined safe zones.
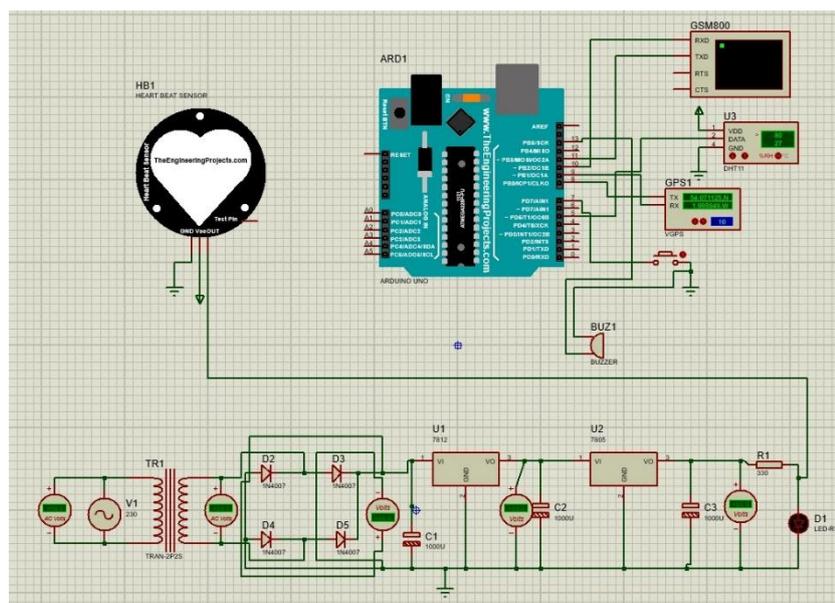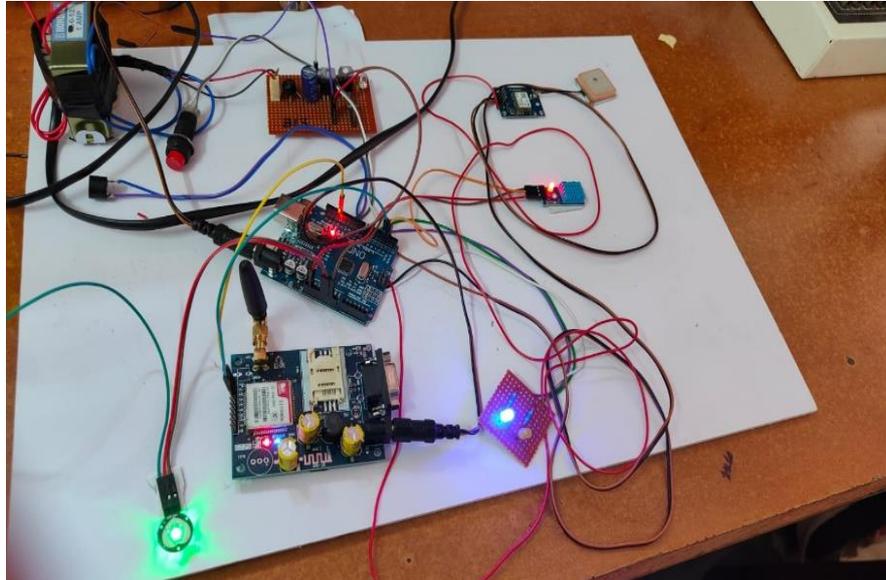

Figure.2 Schematic Diagram

RESULTS

Figure.3 Working Kit

APPLICATIONS

User Interface and Mobile Application:

Develop a user-friendly mobile application for parents or guardians to monitor the child's location, set geofences, and receive alerts. Ensure the application is available on popular platforms such as iOS and Android. Implement features for two-way communication between the parent's phone and the child's jacket.

Safety and Compliance:

Ensure the device complies with relevant safety standards and regulations for child products.

ADVANTAGES

By using the Trans Global Geomatics Pvt Ltd Personal GPS Tracking Device, some of the important benefits to the parents are as follows:

Know the current location: Our Kids GPS Tracker provides real-time location of your children. You can track the live locations of your kids, where they are and what they are doing.

Get travel details of kids at any time: Parents will get all the details like their kid boarding/de-boarding school bus. Also, they can get emergency alerts when the child fails to board or de-board at the other stop.

Emergency call: Our GPS trackers have an emergency call button. In case your kids are in any danger, just they need to do is press the button to connect to you. It will be on alert state, a call can be done & a notification will be sent to family members.

Alerts: Both the parents and school authorities can receive alerts, notifications or messages about the child's whereabouts. Even if there is any traffic jam, break down, parents will get a warning helping to take necessary actions and precautions.

Track your child even in a crowd: Prevent abduction and let your children play and walk around safely. Our **Personal GPS trackers for kids** are great options for parents for monitoring their children 24/7. Our device can track a children's location as well as allow parents to set up a safe zone for their kids.

CONCLUSION

In conclusion, the development of a child safety jacket integrating GSM and GPS technologies represents a significant step forward in ensuring the well-being and security of children. By harnessing the power of these technologies, caregivers and parents gain real-time access to the whereabouts of their children, enhancing their ability to respond swiftly in case of emergencies or instances where a child may wander off. The GSM capability enables communication between the jacket and the caregiver's mobile device, providing instant alerts and updates regarding the child's location. Additionally, the GPS functionality offers precise location tracking, allowing for quick and accurate retrieval of a child in need. Together, these features create a comprehensive safety solution that offers peace of mind to parents and caregivers alike.

Moreover, the integration of GSM and GPS technologies in a wearable form factor like a safety jacket ensures convenience and ease of use. The jacket becomes a seamless part of the child's attire, eliminating the need for additional devices or accessories that may be cumbersome or easily misplaced. This integration enhances the practicality and effectiveness of the safety solution, making it more likely to be embraced and utilized by parents and caregivers on a daily basis.

FUTURE SCOPE

Enhanced Tracking and Monitoring: Future iterations of the child safety jacket could include more advanced GPS tracking capabilities, allowing parents or guardians to monitor their child's location in real-time with greater precision. This could involve integrating advanced GPS sensors and algorithms to provide more accurate positioning information.

Geo-Fencing and Alerts: Implementing geo-fencing technology can allow parents to define safe zones for their children. If the child wearing the jacket moves outside of these predefined boundaries, the system can automatically send alerts to the parents, notifying them of the breach and the child's current location.

Integration with Wearable Technology: As wearable technology continues to advance, future versions of the child safety jacket could incorporate additional features such as biometric sensors to monitor the child's vital signs or activity levels. This information could be transmitted to the parents' smartphones, providing them with valuable insights into their child's health and well-being.

Two-Way Communication: Integrating GSM technology into the jacket could enable two-way communication between the child and their parents or guardians. In addition to receiving alerts and notifications, parents could communicate directly with their child through voice calls or text messages in case of an emergency or to provide reassurance.

Emergency Response Integration: Future iterations of the jacket could include integration with emergency response systems, allowing parents to quickly notify local authorities or emergency services in the event of a child abduction or other emergency situation. This could involve incorporating panic buttons or other emergency signaling devices into the jacket's design.

Smartphone App Integration: Developing a companion smartphone app can enhance the usability and functionality of the child safety jacket. The app could provide a user-friendly interface for parents to configure settings, track their child's location, receive notifications, and access additional features such as historical tracking data and analytics.

Customization and Personalization: Offering customization options for the jacket's design, color, and features can appeal to a wider range of users and ensure that it meets the specific

needs and preferences of individual families. Personalization features could include adjustable sizing, removable sensors, and compatibility with other accessories or clothing items.

Data Security and Privacy: Ensuring robust data security and privacy protections is crucial for any device that collects and transmits sensitive information, especially when it involves tracking the location of children. Future iterations of the child safety jacket should implement strong encryption protocols, secure data transmission methods, and user consent mechanisms to protect against unauthorized access and misuse of personal data.

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