IoT Based Safety Gadget for Child Safety Monitoring & Notification

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Abstract

We proposed a IOT device that can be wearable and connected with IOT application. In that parents can create a Geo-fence from the child location. The IOT device contains GPS module so that parents or guardians can continuously monitor child's location. If they cross the Geo-fence the notification will sent to parents or guardians. If any emergency situation may occur to child, an alert or message will be sent to parents or guardians.

2.Introduction

Child abuse, sometimes referred to as child maltreatment (CM), is a worldwide problem that can happen anywhere. Over the past 20 years, this problem has grown significantly years. Physical abuse of children is only one type. verbal, sexual, or emotional. The problem of child abuse is very its crucial to be cautious because it could harm the child and how it will impact the child's future social life. In every nation, there are groups dedicated to stopping and treating child abuse. the Indonesian government's Commission for the Protection of Indonesian Children, Indonesia's Komisi Perlindungan Anak (KPAI) serves as a formal institution to child abuse's effectiveness prevention. The commission advances the security, permanence, and the welfare of kids, teens, and families through tying together adoption, child welfare, and associated the public and professionals to information, resources. With resources covering issues related to child welfare, child abuse, adoption, away-from-home care, and more. As stated by since 2011 to the KPAI Data System, the number of child abuse 22,109 cases are in 2016. the crimes where kids are the prime suspects contribute significantly to the abuse of children in Indonesia. It is eloquently put in earlier research. Information technology (IT) is being utilised across all industries. Really long Previously, sending mail or handling finances might take days. Users today simply require a PC with internet access to real-time communication. This study supports the IT-based programme for preventing child abuse. Geofencing and mobile technology-based preventative strategy technique. The model is utilising the geo-targeted application to track the kid's whereabouts and signal an emergency transmitting messages, as well as status. The method used is Frequently employed in the creation of location-based applications is geo-fencing. The monitoring method used by geo-fencing geography-based strategy using a virtual fence that automatically notices when an object enters or exits a fence the wall. Recent mobile applications have employed geo-fencing to monitor logistics, emergency applications to aid in disaster survival, Alzheimer's patient monitoring, and even agricultural areas. The geo-fencing technique is utilised in this study to build up the child activity zones. The parents labelled places like the neighbourhood, school, park, friends' houses, etc. It also covers the areas where kids are not allowed. To transmit an emergency alarm automatically to the

server, parents, and institution in charge, the programme is additionally supported by a motion sensor module and a voice recorder module. The goal of this research is to develop IT-based child protection that will make it easier for parents and the government to monitor youngsters. The mechanism is triggered by the use of a sensor module to displays the first iteration of a child protection system to make it more effective and efficient.

3.Literature Survey

Child abuse has become recognised as a global problem that needs to be controlled by all nations. Child abuse is sometimes described as a type of social deviance that can negatively impact children's social lives. Physical abuse, neglect, mental abuse, and sexual abuse are the four types of abuse that characterise typical child maltreatment . Therefore, it requires prompt attention and action from the institution's administrators and parents. By gathering information on important topics, such as family and alternative care, children in need of special care and protection, and child rights, the Commission for the Protection of Indonesian Children is tasked to function as an entity in charge of child protection matters. It is in charge of handling cases that are directly related. Parents need to actively participate in the system of preventing child abuse, not merely talk about it. However, the issue when the parents are distracted by other commitments like working, cleaning the house, etc. Nowadays, IT or information technology, has been widely utilised in any fields. When we were younger, we had to go to the post office to send the letter to get in touch with other people. however, IT nowadays makes it easier for us to connect effectively online link everywhere and whenever possible. These are requirements. The experimental system for keeping an eye on kids that allowed for motion and media has been produced using Raspberry Pi [15]. It allows for using the webcam to take ongoing photographs. The directly sent to Raspberry Pi from the camera processed to become a streaming video in real time. Additionally, it permits the system to recognise and detect movement. The moving images and streaming video and Raspberry Pi local drive storage for detection. To this system can be viewed to accommodate parental monitoring employing internet-connected devices with a web browser. One other research, the cell phone app for safeguarding women had been produced. The software included image and detection capturer. When using a mobile device when motion was detected, it would notify the families. The photograph is intended to be abuse-proof. Beside the system was able to send the photos and the user's location

4.Proposed methodology

The operations of all the subsystems are controlled by the Arduino UNO - Atmega 328p microcontroller, which operates as a firmly established computing device. It is connected to every other module in the apparatus, including the IoT Module, GPS and GSM Module, MEMS accelerometer, and Heartbeat and Temperature Sensor. The number of times the heart beats per minute (BPM) is referred to as heart rate, and the pulse, which is measured by a heartbeat sensor, is the number of times the heart beats per minute that can be felt in any artery that lies close to the skin. MEMS devices are growing in popularity due to their smaller size, lower mass, volume, power consumption, lower cost, ease of system integration or modification, small thermal constant, high resistance to vibration, shock, and radiation, ability to

be manufactured in large arrays, improved thermal expansion tolerance, and parallelism. "Global Positioning System" or GPS. The position of any site can be found using the satellite navigation system known as GPS. Hardware and software components are used to create IoT devices. The interface with the physical environment is implemented using specific hardware components, which allows it to carry out more computationally challenging tasks. The proposed device is connected to a server over the internet, enabling parents to track their kids in real time. The desired solution offers the benefit of pinpointing a child's precise location using GPS, and updates the information to the end user, such as the child's parent or other family members, via a mobile application and SMS. It is a dependable and safe way for child protection. Here, a tool is introduced that, as previously said, ensures child safety. The different sensors, including the heartbeat sensor, MEMS, temperature, and humidity sensors, will sense the corresponding values when the children are wearing this device and provide them to the microcontroller. The controller will compare and real values based on the heart rate thresholds, ambient temperature, and humidity. Additionally, the same information will be updated via IOT and returned to the mobile application via a cloud server. Information will be given if internet services are unavailable. using SMS over GSM. For instance, if there is a substantial discrepancy between the threshold and detected value, the heart beat sensor monitors the child's pulse rate and uses IOT to send an emergency message to the cloud and police control room. The technique has demonstrated that it gives kids total security no matter where they use it. This strategy also includes the introduction of a GPS module, which will follow the user's location and record all sensor readings in the Internet of Things. Only a few parameters have interfaces, so when they exceeded a threshold, their values were stored in the Internet of Things. The child will feel safe and protected as a result. In this procedure, there is no need for manual labour. In an emergency, the user may be better protected than the current method. Although there are several applications available to lower the risk of misuse by sending SMS, this model also includes a MEMS accelerometer that can alert parents to any potentially harmful conditions. As a result, this study develops and illustrates a new intended technique by overcoming the drawbacks of the current method.

5.Results and Discussion

In this part, the outcomes that were achieved are discussed. The suggested module is typically described as having an LCD display and SMS communication for information sharing. The suggested prototype includes a mobile application on the end user terminal that is accessible by authorised users with login credentials. Through GPS and GSM, the location and emergency information are also sent via SMS to the registered mobile numbers and the closest police station. The device IOT application's end user login screen is displayed. Only those who have registered and been approved are able to enter and examine the information about the kids. After entering the login page, the user is presented with an information page that includes the login date and time, the environment's temperature for the child wearing the device, the MEMS accelerometer's status as DETECTED/NOT, location information, including the child's latitude and longitude, and the status of the panic button as

DETECTED/NOT. As soon as a child is more than 1 km from a parent or guardian, the same information is sent through SMS to the registered cell phone numbers every 30 minutes. With the aid of GPS and GSM services, an alert will be transmitted in the event of an emergency to the control centre of the closest police station. The user-generated alarm message sent over the cloud without a signal. As a result, the parents or guardians will be aware of the information on their children.

6.Conclusion

The intended mechanism offers a better way to view and track the children's whereabouts using latitude and longitude, which can also be done using Google maps. Being safe and secure has the added benefit of reducing child abuse, which is today's responsibility. The main task of this project is to design and create a device that is so compact that it offers the benefits of its own safety technique, especially for kids. This design is suggested as a solution to the majority of risky conflicts faced by kids and will aid in their protection. With real-time location tracking, it can be used to find misplaced children at any moment and notify their guardian or parent. The Arduino module uses IT to improve communication and adds a heartbeat sensor and a MEMS accelerator in order to defeat GSM. If an accident occurs, an instant message with the location is sent to the registered contacts as well as the closest police stations and the children are immediately rescued.

7.Reference

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