SURVEY ON CHILD SAFETY USING IOT

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Abstract

Child safety is a vital responsibility, and ensuring that our kids are safe is a positive step. Here, we have an IOT smart device with a sensor network that doesn't need a lot of user-level technical knowledge. It works by gathering real-time data from sensor nodes that monitor the environment and sending it to a cloud server. In the event of an emergency, the device notifies the user. Finally, we contrast the articles to highlight their uses.

Keywords – Child Safety, IOT, Cloud Server, Smart device,Child monitoring system.

INTRODUCTION:

A country's growth and development not only depend on the technological advances but, the pulse of the development is people's safety especially the infants irrespective of their gender. There is a tremendous growth in technology but at the same time crime rates are also increasing that causes a lot of fear in people's life, especially the fear of parents for the safety of their child remains unceasing. For every year, approximately 8 million children go missing or abducted in the case of child abuse, child trafficking, child kidnapping and so on. With today's economic crisis, the parentsput a lot of focus on their work life rather on their future generation. Though if we keep our children safeguarded from all these precariousness just few seconds of inattentiveness might end up with child's lifein danger. With the similar conditions considered, Internet Of Things provides great support in safety of the children from impending dangers.

The concept of IOT was first introducedwith a smart toaster but now it is playing a vital role in everyone's life, starting with controllingappliances from anywhere, it made our lifeseem simpler. IOT makes numerous benefits to society, but ensuring safety and security is one of its largest benefits. In the IOT era, information may be gathered more affordably and delivered more effectively, improving living standards, safety, and movement efficiency, such as air quality detection and child health monitoring. A camera module is included in addition to the measurement of ambient noise and the calculation of journey time to enable face recognition and to obtain the necessary information in the form of notifications or warnings when the child is in danger. Also, it can be used with any mobile device and doesn't require a lot of technical knowledge from the use.

RELATED WORKS:

Components

In this paper a wearable device is proposed for tracking the activities and security of the child. The wearable device consists of heart beat sensor [1][2][8][10], pulse sensor[2][3][7][11], temperature sensor[2][4][8][10][11][12], GSR (Galvanic Skin Response) and BVP (Blood Volume Pulse) sensors [7], flex sensor[11], optical sensor [12], humidity sensor [12], micro sensor [12], proximity sensor [12], touch sensor [8][10][11], gas sensor[1][2], IOT board[2], RFID System[3][6], Raspberry Pi[2][7][8][10], Android App[2], GPS, GSM Module[5][7][8][10][11][12], Sound amplification[2], Camera Module[2][8][10], SOS light[4][5], Sound detection sensor module[8][10],Alarm buzzer[7][11].

Working of Sensors

ARM7 microcontroller and GPS are combined with Android smart phone features on this device [1]. In [2], they made use of geo-fencing method, where the device passes all information to server and also provides it to the GSM module. The blood pressure of the child is measured by a blood pressure sensor integrated into the device [2][12]. The detector can provide a warning signal to the parents to take care of the child whenever the child's blood pressure is high or low. The addition of an alcohol smell sensor and a smoke sensor makes this gadget standing out [1].. This smokesensor helps in sensing smoke from fire accidents as well as acts as a Cigarette smoking sensor. The smoke sensor, alcohol sensor and BP sensor combined is used to assess whether the situation is dangerous are not. The communication between these sensors provides the expected behaviour. A message will be sent directly to emergency services like Child Help Line or Police Help Line in the event of an emergency if the destination module fails to reach the parents.. In [2], an app is used to shows the saved data to the

parent. The registered parents will be able to view the health parameters and track the child's location when needed in the app. A server page is also available that stores all the entries so that in case of any malfunction in app it acts as a backup. Live streaming is provided by using camera module along with screenshots which is sent via email to intimate the parents. Since child"s voice tends to be frail, sound amplification is used to boost it to some extent.

RFID

The RFID system [3] happened to be used to track students at school. Using an existing RFID scanner, the unique identification information that belongs to the students happens to be sent to the server. This information has the ability exist as a accessed by the RFID server software inside of order to track which students happen to be inside of what areas that belongs to the school.

SOS and Buzzer

As the light flashes the universal SOS symbol, [4] proposes the use of a SOS light that allows people nearby to be alerted if the child is in distress. Activating the SOS light symbol involves sending a SMS that contains the keyword "SOS". Parents are also capable of sending SMS messages. The wearable's distress buzzer can locate the child by raising a loud alarm. An SMS with the phrase "BUZZ" is sent to activate the buzzer module.SOS and buzzers work similarly in that when a child is lost and is in danger, they send out a distress signal to the people in contact.

Inside of [5] the parent device has the ability to remotely access the child"s device such as turning on top of the microphone whenever needed.

CCMF, LinkIt and Sensors

Through crowdsourced sensing networks that include smartphone users and outdoor GPS and indoor IOT location, the CCMF framework [6] is able to locate missing children with wearable devices equipped with mobile iBeacons and 3-axis accelerometers. This framework allows you to locate lost children with the help of their mobile iBeacons in hand wearables. Convolutional neural network (CNN) method and artificial neural network (ANN) method of posture recognition is designed to help refine the recognition success rate and false alarm rate of the CCMF as muchas possible.

The Decision Tree Classifier Algorithm [7], is used to detect distress situations with sensor values as inputs. Electrodermal activity (EDA)or Galvanic skin response measures the electrical conductivity of skin. By combining GSR with temperature and BVP or heart rate, the type and intensity of emotion can be detected with high accuracy. GSR can only measure the intensity of emotion; it cannot determine the type of emotion. They were selected because they are compact, more relevant in danger . Two LED lights aid in indicating the system's status For proximity alerts, a piezoelectric buzzer a high-pitched tone. red LED indicates a problem with the GSM or GPS module, while green LED blinks three times when an alert has been sent in case of any distress. For proximity alerts, a piezoelectric buzzer makes a high-pitched tone. The red LED indicates a problem with the GSM or GPS module, while the green LED blinks three times when an alert has been sent in case of any distress. For proximity alerts, a piezoelectric buzzer makes a high-pitched tone. The red LED indicates a problem with the GSM or GPS

module, while the green LED blinks three times when an alert has been sent in case of any distress.

In [8] [10], it is built using a LinkIt ONE board, programmed in embedded C, and has sensors such as temperature, heartbeat, touch, GPS, GSM, and cameras are also supported. As an all-in-one prototyping board for wearables and IoT devices, Arduino board is similar to the LinkIt ONE board which consists of Wi-Fi, GPS, GSM, and Bluetooth modules built-in. It uses a touch sensor, which is an electronic device that detects and records physical touch. When the touch sensor value breaches the threshold limit, SMS and MMS is delivered to the mobile.

There exists a panic button which can be pressed once the child feels unsafe, and there is the GPS module that is present along with it, which can be activated immediately so that the location that belongs to the child can be sent to the parent via text message [9].

Flex and Emotion sensor

A flex sensor [11], is a sensor that measures the amount of deflection or bending. When a touch is detected on the touch sensor, the body parameters are sensed by the device such as changes in temperature, the heartbeat rate and the victim's movement using the flex sensor. Upon breaching the threshold limit, the sensor is activated and the device traces the victim's location and delivers the location in the form of a message to the parent's device. The camera starts recording as soon as the child's device is turned on and transmits the live video to the contact number registered with the device. In order to hide this camera from the public, the camera can be fixed to the child's dress so that it is hidden from public view.

[12] Information about emotional state, pressure, and anxiety levels can be recorded with the emotion detector. It makes use of an emergency button, which, when touched, automatically records video and dials four emergency contacts..

CONCLUSION:

The above papers demonstrated the importance of child safety and also proposed advanced IOT models to particularly achieve it, which is fairly significant. Similar to smart watches more sort of progressive wearable models is required which goes undetected in public's view but promotes utmost safety for the child. The concepts and sensors mentioned in these papers can surely provide an effective device which can minimize the percentage of risks that a child may go through in a major way. All the papers for the most part concluded that they will really overcome their drawbacks by upgrading their device with more constructive features and thereby providing a safety environment for the child.

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