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Artificial Intelligence Based Child Safety Smart Band

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ABSTRACT: The overall percentage of child abusements filed nowadays in the world is about 80%, out of which 74% are girl children and the rest are boys. For every 40 seconds, a child goes missing in this world. Children are the backbone of one's nation, if the future of children was affected, it would impact the entire growth of that nation. Due to the abusements, the emotional and mental stability of the children gets affected which in turn ruins their career and future. These innocent children are not responsible for what happens to them. So, parents are responsible for taking care of their own children. But, due to economic condition and aims to focus on their child's future and career, parents are forced to crave for money. Hence, it becomes difficult to cling on to their children all the time. In our system, we provide an environment where this problem can be resolved in an efficient manner. It makes parents to easily monitor their children in real time just like staying beside them as well as focusing on their own career without any manual intervention.

KEYWORDS: smart band, child safety, Artificial intelligence , sesors, etc

I. INTRODUCTION

Basically, children cannot complain about abusements which they face in their daily life to their parents. They can't even realize what actually happens to them at their age. It is also difficult for parents to identify their children are being abused. Since to prevent children before being attacked, an autonomous real-time monitoring system is necessary for every child out there. In this system, the collected values from every sensor like temperature sensor, pulse rate detection sensor and the location value from GPS are used to detect the status of the child and alerts the respective guardians using GSM accordingly. The inspiration for this wearable comes from the increasing need for safety for little children in current times as there could be scenario of the child getting lost in the foremost crowded areas. This project focuses on the key aspect that lost child can be helped by the people around the child and can play a significant role in the child's safety until reunited with the parents. Raspberry Pi3 fetches various kinds of data from different modules which are interfaced to it.

II. SIGNIFICANCE OF THE STUDY

The overall percentage of child abusements filed nowadays in the world is about 80%, out of which 74% are girl children and the rest are boys. For every 40 seconds, a child goes missing in this world. Children are the backbone of one's nation, if the future of children was affected, it would impact the entire growth of that nation. Due to the abusements, the emotional and mental stability of the children gets affected which in turn ruins their career and future. These innocent children are not responsible for what happens to them. So, parents are responsible for taking care of their own children. But, due to economic condition and aims to focus on their child's future and career, parents are

forced to crave for money. Hence, it becomes difficult to cling on to their children all the time. In our system, we provide an environment where this problem can be resolved in an efficient manner. It makes parents to easily monitor their children in real time just like staying beside them as well as focusing on their own career without any manual intervention.

III. REVIEW OF RELATED STUDIES

[1] Title: RFID**-based System for School Children Transportation Safety Enhancement**
Author: Anwaar Al-Lawati, Shaikha Al-Jahdhami, Asma Al-Belushi, Dalal Al-Adawi, Medhat Awadalla and Dawood Al-Abri Year: 2015

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This paper presents a system to monitor pickup/drop-off of school children to enhance the safety of children during the daily transportation from and to school. The system consists of two main units, a bus unit and a school unit. The bus unit the system is used to detect when a child boards or leaves the bus. This information is communicated to the school unit that identifies which of the children did not board or leave the bus and issues an alert message accordingly. The system has a developed web-based database-driven application that facilities its management and provides useful information about the children to authorized personal. A complete prototype of the proposed system was implemented and tested to validate the system functionality. The results show that the system is promising for daily transportation safety.

Advantages:

- It provides useful information about the children to authorized personal

Disadvantages:

- Performance is poor.

[2] Title: Child Safety Wearable Device

Author: Gopinadh Jonnadula1 , Bhanu Prasad Davu2 , Hari Kishore Kandula3 , Vinod Donepudi4 , Sivaiah Etukuri5 ,
Year: 2018

The device will reply back with a text containing the real time accurate location of the child and will also provide the surrounding temperature, so that the parents can keep track if the temperature not suitable for the child. The secondary measure implemented was using a bright SOS Light and distress alarm buzzer present on the wearable device which can be activated by the parents via SMS text to display the SOS signal brightly and sound an alarm which a bystander can instantly react for the child's safety till the parents arrive or they could contact the parents and help locate them. Hence this project aims at providing parents with a sense of security for their child in today's time.

Advantages:

- Parents can keep track if the temperature not suitable for the child

Disadvantages:

- This project requires manual intervention.

[3] Title: IoT Based Child and Woman Safety

Author: MahejabeenBudebhai
Year:2018

The proposed system “IoT Based Child And Woman Safety” can be used to locating missing or lost children and also tracking the child movements outside from the home. The system can also be used to locate women who are in danger. We have combined GPS with one of the basic service of a smart phone which is GSM more specifically SMS in one system. Our proposed model contains various sensors which measure different parameters on a regular basis. In case of emergency a message will be sent to parents and/or police, by either pressing the panic button or pronouncing the keyword. The complete system is implemented using Raspberry Pi 3 Model B. Python programming is used interface all the sensors and other hardware. This device is wearable (like a wrist watch), and so it is easy to carry.

Advantages:

- The system can also be used to locate women who are in danger

Disadvantages:

- This system is very unreliable source to transfer information.

III. OBJECTIVE OF THE STUDY

- To monitor the child from remote place
- To detect the unusual activities around the child
- To trace the child
- To make the child happy and teach using AI in free time

IV. METHODOLOGY

- An Arduino is an open-source microcontroller development board. In plain English, you can use the Arduino to read sensors and control things like motors and lights. This allows you to upload programs to this board which can then interact with things in the real world. With this, you can make devices which respond and react to the world at large.

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- The Raspberry Pi device looks like a motherboard, with the mounted chips and ports exposed (something you'd expect to see only if you opened up your computer and looked at its internal boards), but it has all the components you need to connect input, output, and storage devices and start computing.
- GPS stands for global positioning system which was created by US department of defense for the navigation of military in any part of world under circumstances. But with the time, this system is now being used for many other purposes and GPS system has proved to be a revolutionary technology in today's world.

- MQ2 gas sensor can be used to detect the presence of LPG, Propane and Hydrogen, also could be used to detect Methane and other combustible steam, it is with low cost and suitable for different application. Sensor is sensitive to flammable gas and smoke. Smoke sensor is given 5 volt to power it. Smoke sensor indicate smoke by the voltage that it outputs .

- Pulse Sensor is a well-designed plug-and-play heart-rate sensor for Arduino. It can be used by students, artists, athletes, makers, and game & mobile developers who want to easily incorporate live heartrate data into their projects. The sensor clips onto a fingertip or earlobe and plugs right into Arduino with some jumper cables. It also includes an open-source monitoring app that graphs your pulse in real time.

- Push-Buttons are normally-open **tactile switches**. Push buttons allow us to power the circuit or make any particular connection only when we press the button. Simply, it makes the circuit connected when pressed and breaks when released. A push button is also used for triggering of the SCR by gate terminal.

- Raspberry Pi Zero/W Camera Module is of 160 degree 5MP is mounted on a flexible circuit board. CSI interface is used, which can provide extremely high data rates, and for transferring pixel data.

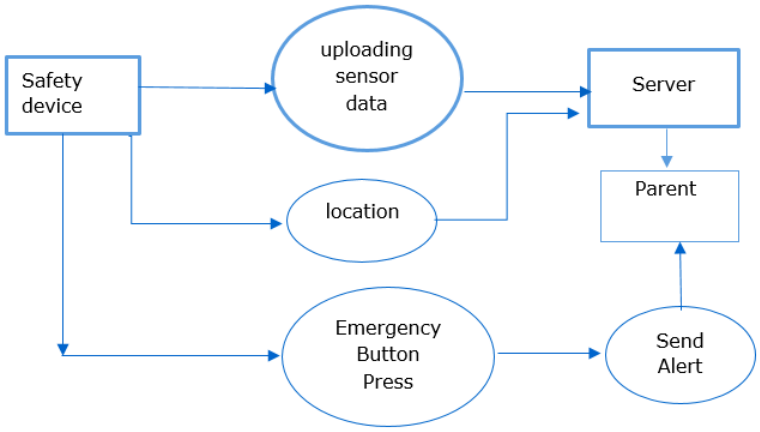

Fig: DFD-L0

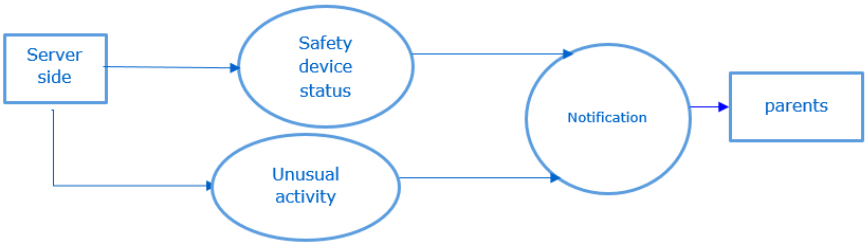

Fig: DFD-L1

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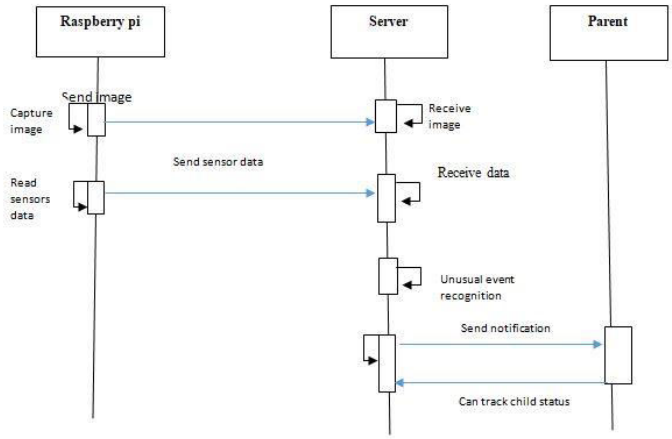

FIG:SEQUENCE DIAGRAM

V. TECHNIQUES USED IN NOTIFICATION

HEALTH STATUS MONITORING

- Pulse and temperature sensors connected with the child body collects the data and send to the server
- For any abnormal data send alert to the parent's mobile

UNUSUAL EVENT RECOGNITION

- CNN model to train the unusual activities like detecting gun, knife, stick.
- Camera connected with the raspberry pi captures the image and send to the server.
- Server processes the image and predict the unusual activities
- If detected send alert to the parent

LOCATION ALERT

- The smart band is fitted with the GPS module
- GPS module captures the location and send to the server periodically
- Server trace the location movement
- Can detect if the child goes out of the range permitted
- Send alert if the child gets into the school bus and reaches a bus stop

INTERACTION

- Parent can communicate with the child if needed
- Parent can use their mobile app
- The smart band is fitted with the speaker and microphone
- Speech to text using Google TTS module

LEARNING MODE

- The smart band is pre-loaded with the learning kit
- It can teach alphabets, tables, rhymes and other general purpose information
- These information are being played and child can hear in his/her free time.

VI. CONCLUSION

Therefore, each and every parent should take care of their own children, without letting them to fall into the dark world of abasements, which entirely ruin them physically, mentally and emotionally destroying our future. Hence, considering the importance of our future, our project makes it easy for parents to track their children and to visually monitor them on regular basis, which makes them ensure the safety of their children and reduces the rate of incidents of child abuse.

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