

CHILD SAFETY WEARABLE DEVICE

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Abstract— *The objective of this project is to safeguard the child from threads. Now a days the safety measures of children has been reduced in huge number. Thus the violence against children increasing day by day. Not only kids even women are also abused both physically and mentally. We are taking small step towards violence against the kids. Our project mainly focus on sensing the children's Temperature and Heartbeat. By monitoring the activities the state of the child is analyzed. By using GSM, if child reaches the critical state then the latitude and longitude of that particular location is sent as an alert message to the parents. In this system, it has a MEMS sensor which is used to detect the abnormal vibration and it is controlled by NodeMCU micro controller.*

Key words: Children, Wearable, Safety, GPS, GSM, MEMS Sensor, Thing Speak, Vibration Sensor.

I. INTRODUCTION

INTERNET OF THINGS (IOT) is the new technology that connect the entire world. It establish the connectivity among various systems or devices or services in order to make automation development in all areas. Child safety is a very big and unsolved issue in our society. Many of the crimes are left without reported. Each and every day young children are being assaulted, molested and violated. The street, public transport, public spaces have became the territory of the hunters. Rape is the one of the major crime in India practice against children's. The crime rate is growing steadily since last few decade. Hence this device makes a step forward and safes victims from such situations. This device is designed in such a way that is easy to use as it works by detecting the abnormal vibrations. Kerala is the state that has the rate 455/1,00000 which is highest of crime reported in the year 2017-2018 says the NCRP (National Crime Records Bureau) and tamilnadu holds the 3rd position with the rate of 294 /1,00,000 in the NCRP Report of the same year.

II. LITERATURE SURVEY

A. Embedded IEEE Project Child Safety Wearable device:

The concentration of this paper is to have an SMS content empowered correspondence medium between the children wearable and the parent as nature for GSM portable that correspondence is practically present all over the place.

The parent can send a content with particular catchphrases, for

example: area, temperature, uv, sos, buzz and wearable gadgets will answer back with a content containing the continuous exact area of the youngster which after will gives applications.

B. Child safety wearable device

The child safety device is capable of acting as a capable IOT device it provides parents with the real time location, surrounding temperature, UV radiation index and SOS light along with distress alarm buzzer for their child's surroundings and the ability to locate their child or alert by standers in acting to rescue or comfort the child. The smart child safety wearable can be enhanced much more in future by using highly compact arduino modules such as the lily pad arduino which can be sewed into fabrics. Also a more power efficient model will have to be created which will be capable for holding the battery holding for longer time.

C. Women safety device:

Suraksha it describes that the device can be actuated by three ways namely, voice, switch and shock. The device when not in use locked so that the unnecessary signals are not sent. For unlocking it, a simple voice command is sufficient when the device is thrown with the force, using force sensor it will start functioning that is it will send the location to the police and distress message to the registered mobile number. The working of the device connected with the jewellery which sends a message to the person when the abnormal force is applied which is like a button, this records a voice message. This device is embedded with the jewellery. But accessing the button in danger and sending alert message through recording audio are the main drawback.

D. Women safety device:

Safety and security in public transportation based on public perception in developing countries poses higher risk of safety and security since there happen to be more passengers in one car .the problem becomes worse in developing countries, because of the lack of suitable and integrated approaches. The aim of this research is to explore the perception of safety problems of those parties involved in the operation of public transportation. This perception is used as a base to develop and improvement agenda for the context of developing countries. The research employs a questionnaire survey to collect the perception data.

III. EXISTING SYSTEM

This work attempts to tackle a societal concern that has been destroying the lives of uncountable individuals and their families. This device continuously monitors the individual wearing it, the data being accessible world over enabled by the benefits of cloud computing. The data can thus be downloaded onto any remote station for monitoring and analysis. The machine learning algorithms used make the device intelligent and the accuracy of which increases with continued use. A device like this improves the level of safety of women and girls. Accurate recognition of a dangerous situation is a complex matter, however, the scope for improved accuracy is promising.

IV. PROPOSED SYSTEM

The child safety wearable device is capable of acting as a smart IoT device. It provides parents with the real-time location, surrounding temperature, UV radiation index and SOS light along with Distress alarm buzzer for their child's surroundings and the ability to locate their child or alert bystanders in acting to rescue or comfort the child. The smart child safety wearable can be enhanced much more in the future by using highly compact Arduino modules such as the LilyPad, Arduino which can be sewed into fabrics. Also a more power efficient model will have to be created which will be capable of holding the battery for a longer time.

V. BLOCK DIAGRAM

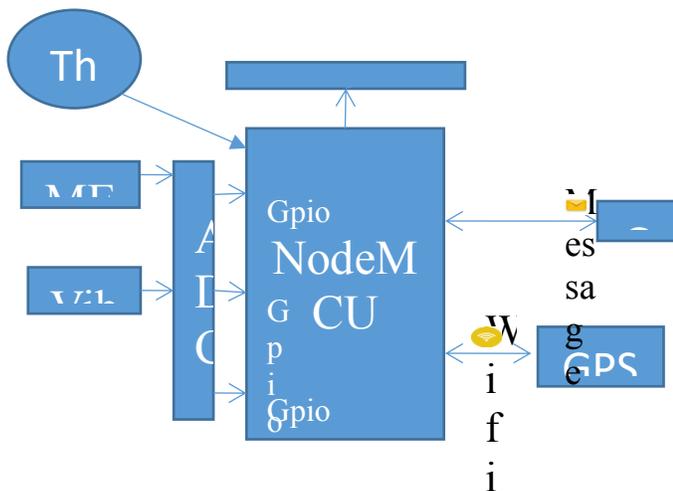


Fig 1: Block Diagram

Thing Speak is an open-source Internet of Things (IoT) application and API to store and retrieve data from things using the HTTP protocol over the Internet or via a Local Area Network. Thing Speak enables the creation of sensor logging applications, location tracking applications, and a social

network of things with status updates". Thing Speak was originally launched by iobridge in 2010 as a service in support of IoT applications. Thing Speak has integrated support from numerical computing software MATLAB from Math Works allowing Thing Speak users to analyze and visualize uploaded data using Mat lab without requiring the purchase of a Matlab license from Math works.



Fig 2: MEMS Sensor

Micro Electro Mechanical Systems or MEMS, is a technology that in its most general form can be defined as miniaturized mechanical and electro mechanical elements that are made using the techniques of micro fabrication. The critical physical dimensions of MEMS devices can vary from well below one micron on the lower end of the dimensional spectrum, all the way to several millimeters. Likewise, the types of MEMS devices can vary from relatively simple structures having no moving elements, to extremely complex electromechanical systems with multiple moving elements under the control of integrated microelectronics. The one main criterion of MEMS is that there are at least some elements having some sort of mechanical functionality whether or not these elements can move. The term used to define MEMS varies in different parts of the world. In the United States they are predominantly called MEMS, while in some other parts of the world they are called "Microsystems Technology" or "Micro Machined Devices".

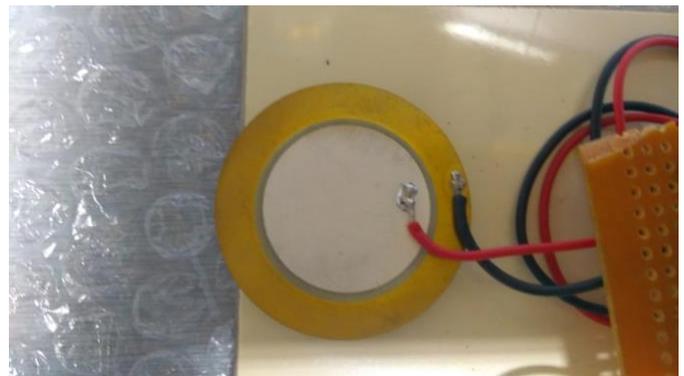


Fig 3: Vibration Sensor

Vibration sensors are sensors for measuring, displaying and analyzing linear velocity, displacement and proximity or acceleration. Abnormal vibration indicative of problems with an industrial machine can be detected early and repaired before the event of machine failure. Therefore vibration analysis is used as a tool to determine equipment condition as well as the specific location and type of problems. The LM35 temperature sensor is used to monitor temperature of the child. If the temperature of the child is greater than 35°C then the message is send to caretaker. This text file is sent as a mail to a caretaker. The LM35 features are calibrated directly in Celsius (Centigrade), it is less than 60 μA current drain and the Temperature sensing range over a -55°C to 150°C.



Fig 5: GSM

GSM stands for Global System for Mobile Communication. The idea of GSM was developed at Bell Laboratories in 1970. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands. GSM makes use of narrowband Time Division Multiple Access (TDMA) technique for transmitting signals. A GSM digitizes and reduces the data then send it down through a channel with two different streams of client data each in its own particular time slot. The digital system has an ability to carry 64kbps to 120Mbps of data rates. There are various cell sizes in a GSM system such as macro, micro, pico and umbrella cells.



Fig 4:NodeMCU

NodeMCU is an open source Iot platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems and hardware which is based on the ESP-12 module. The term NodeMCU by default refers to firmware rather than the development kits. The firmware uses the Lua scripting language. It is based on the eLua project and built on the Espressif Non-OS SDK for ESP8266. It uses many open source project such as luacjson⁸ and SPIFFS⁹. The type of NodeMCU is Single-board microcontroller. The operating system uses XTOS and the CPU is ESP8266¹ (LX106²). The memory is 128kBytes, its storage is 4Mbytes³ and the power is supplied by the USB.



Fig 6: GPS

GPS stands for Global Positioning System is a satellite based navigation system. It provides time and location based information to a GPS receiver, located anywhere on or near earth surface. In this project we are going to interface a GPS module with NodeMCU. A simple local web server is created using NodeMCU and the location details are updated in that server webpage. GPS works in all whether conditions provided

there is an unobstructed line of sight communication with 4 or more GPS satellites. The module will transmit data in multiple strings at 9600 Baud Rate. GPS module sends the Real time tracking position data in NMEA format. When we use GPS module for tracking any location we only need coordinates and we can find this in \$GPGGA string. Only \$GPGGA (Global Positioning System Fix Data) string is mostly used in programs and other string are ignored. GPS module takes some time to capture location details once it is powered on. NodeMCU starts web server and waits for a client to get connected to the web server. Once client is connected to the web server, NodeMCU sends location details to connected client.

VI. SAFETY KIT DEVICE

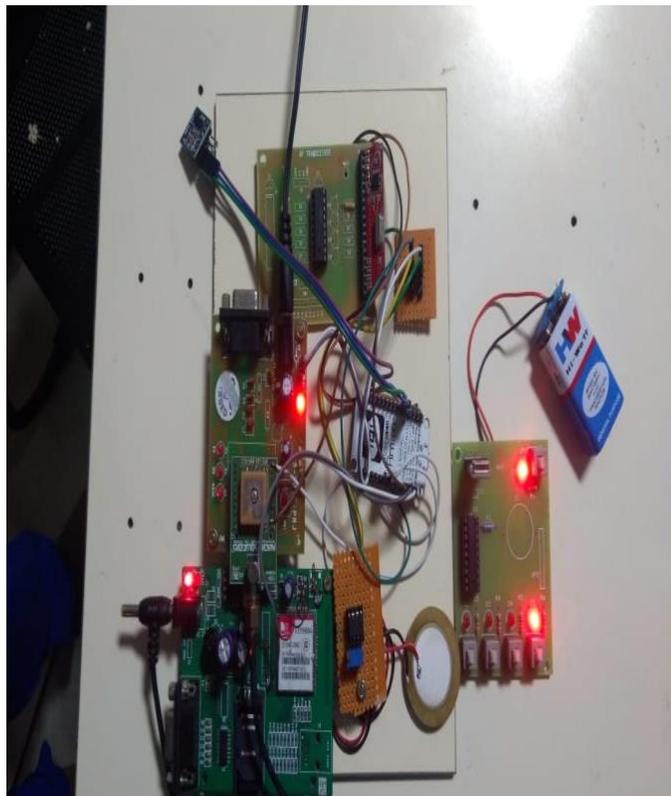


Fig 7: Safety Kit Device

VII. DRAWBACK

According to this paper there is only one disadvantage that is while using this device in any place there must be efficient flow of internet connections, it must be fullest then it gives the output as soon as possible otherwise it take time for the result.

VIII. CONCLUSION

This paper gives the result for the parent in two different ways. The first one is they get an alert message (SMS) for the registered phone number. The next one is they receive an

graphical representation which shows the Latitude ,Longitude, MEMS Sensor and Vibration sensor of the child’s activities through “Thing Speak”. From these notification the parents can find their child in critical state. By this device we can avoid violence against children. This is one step to reduce rape, violence, theft etc.

IX. RESULT

Parents receive an alert message which gives an information in latitude and longitude where the child is present.

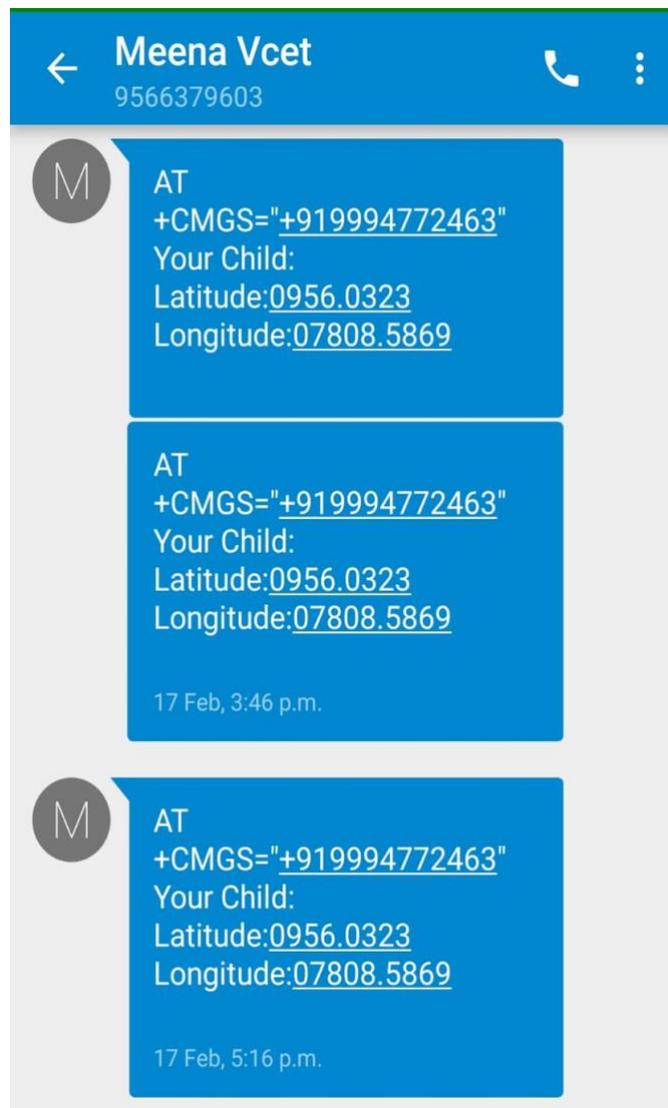


Fig 8: Output in form of SMS

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