

A Review : An Innovative Gadget For The Safety of A Girl Child Against Crime

N. N. Kumbhar, Shrutika K. Bawaskar, Dipali S. Vyawahare

¹Lecturer, Department of Information Technology, Anuradha Engineering College, Chikhli, Maharashtra, India

^{2,3}Department of Information Technology, Anuradha Engineering College, Chikhli, Maharashtra, India

ABSTRACT

The violent crimes against children are on the rise in India. 30% of the population of India is made up of children between the age group of 3 and 14 years. Abuse can be physical or sexual. Abuse cases raise a demand for their freedom. Children between the ages of 3-14 cannot protect themselves in such conditions. The severity of such worse incidents can ruin a child's entire life. According to NCRB (National Crime Record Bureau), Maharashtra ranks second in rape cases. Also, around 98% of cases are committed by someone known to the victim. Nowadays, the safety of children is the utmost need of the society. So, the proposed gadget is the solution for reducing the number of these incidents. Here is an electronic device that will work to detect the pulse rate of the child which are excited during these situations. The gadget consists of Arduino Uno, GPS tracker, GSM sim800L, OLED display, connecting wires, battery.

Keywords : Violent Crimes, Incident, Pulse Rate, NCRB

I. INTRODUCTION

In India, the violent crimes against children are increasing day by day. Near about 30% of India's population consists of children ranging between age group of 3-14 years. Around 15,534 cases were recorded for crimes against in the age group of 3-14 years in 2017 according to the Times of India, March 9, 2018. Abuse may be physical or sexual. Assault cases raise a question to their freedom. But children between the age group of 3-14 years are not able to protect themselves in these situations. These worst incidents can ruin the entire life of the child. According to National Crime Records Bureau (NCRB), around 98% of crimes are committed by someone who is known to the victim. The gadget is a solution for recuding the number of these incidents. Here is an electronic device that will work to detect the pulse rate of the child which are excited during these situations.

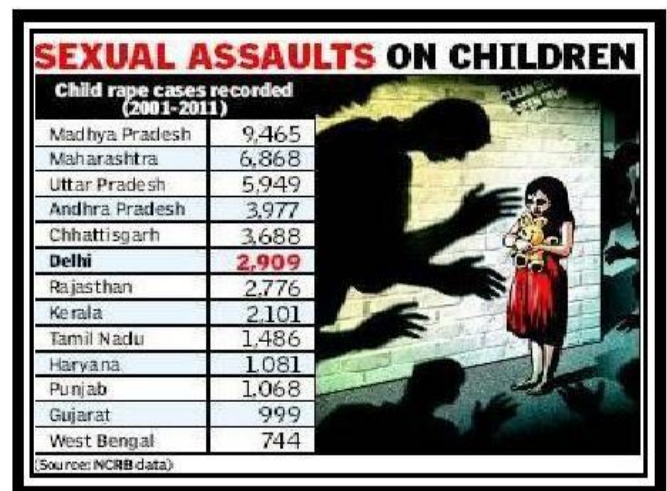


Fig 1. Recorded rape cases

(Source NCRB)

Unfortunately, according to NCRB, Maharashtra ranks second in rape cases. (Source: National Crime Records Bureau)

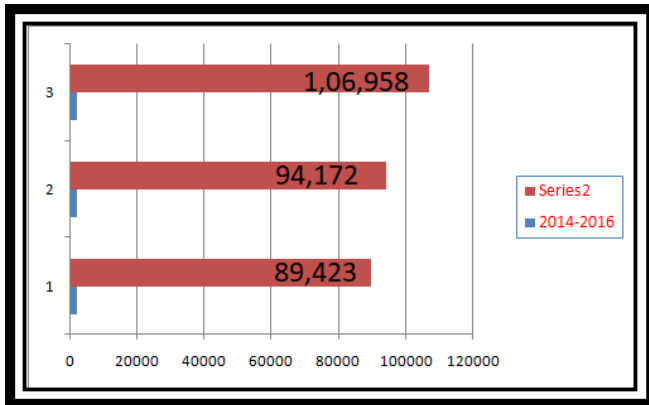


Fig2. Crime against children

According to National Crime Record Bureau, it can be seen that the crime rates has been increased dramatically, which is the worst thing.

II. MEDICAL CERTIFICATION

The normal pulse rate of the age group from 3 to 14 years is 70 to 80 BPM

But in excited state, it will increase to 170-180 BPM.

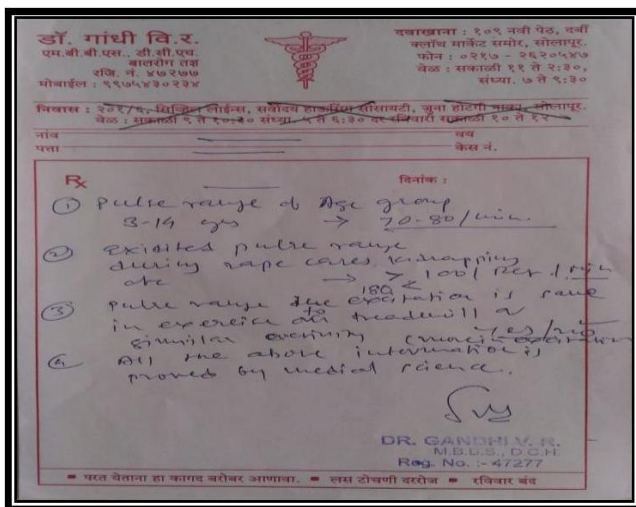


Fig 3. Medical Certificate

III. CONCEPTUAL DESIGN

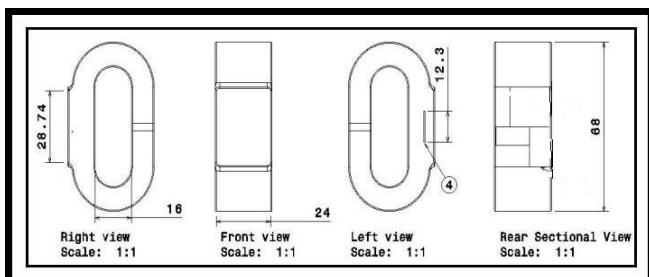


Fig 4. Conceptual Design

IV. COMPONENTS USED IN GADGET

- ✓ Arduino Uno
- ✓ GPS Tracker module
- ✓ GSM sim800L
- ✓ Heart rate module for fingertip
- ✓ OLED Display
- ✓ Wires to connect
- ✓ Battery

Arduino Uno :

An Arduino Uno is a microcontroller board which is based on ATmega328(datasheet). Arduino boards can read input from various sensors and redirect output to mentioned output pins. Near about 7, 00,000 numbers of arduinos are present in the market. Out of these, Arduino ATMEGA-328 microcontroller consists of 14 input and output analog and digital pins (from this 6 pins are considered to be a PWM pins), 6 analog inputs and remaining digital inputs. The power jack cable is used to connect arduino board with the computer. Externally the battery is connected with the Arduino microcontroller for the power supply. Arduino is an open source microcontroller from which there is no feedback present in the microcontroller. This arduino board consist of I2C bus, which can be able to transfer the data from arduino to the output devices.

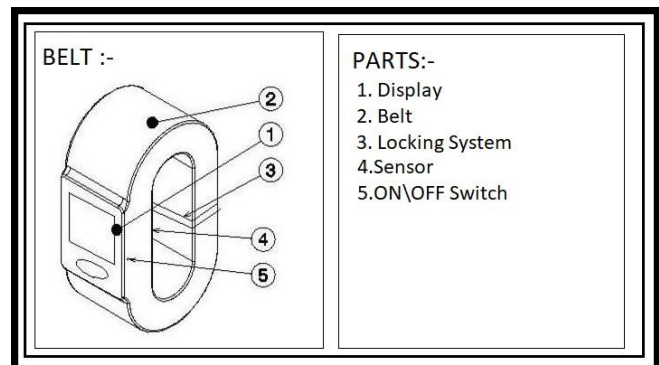


Fig 5. Arduino Uno

GPS Tracker Module:

GPS is a Global Positioning System. The GPS does not require the user to transmit any data, and it operates independently of any telephonic or internet reception, though these technologies can enhance the usefulness of the GPS positioning information. Recorded location data can be stored inside the tracking unit or transmitted to a device connected to the Internet using the cellular modem (GPRS or SMS), radio or satellite integrated into the unit. This allows the location to be displayed on a map background, either in real time or when analyzing the track later, using GPS tracking software. Data tracking software is available for smartphones with GPS capability. The GPS provides critical positioning capabilities to military, civil, and commercial users around the world. Basically there are three types of GPS Tracker. The GPS module receives the GPS signal. Then it calculates the coordinates. And after calculating it, it sends the location of the tracking position to arduino. It provides the real-time location.

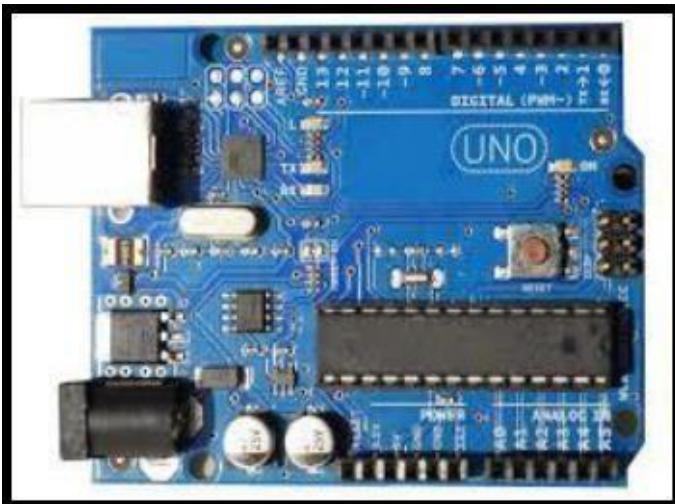


Fig 6. GPS Tracker Model

GSM sim800L

SIM800L is a miniature cellular module that allows GPRS transmission, sending and receiving SMS and making and receiving voice calls. The low cost and the reduced size and the quad band frequency support make this module the perfect solution for any project that requires long-range connectivity. SIM800L is a nice and economical GSM connection board. We will configure it with arduino and send simple text messages. The interface of a GSM module with Arduino is quite simple. You only need to make 3 connections between the GSM module and Arduino



Fig7. GSM sim800L

Heart Rate Fingertip Module:

The pulse sensor is a plug-and-play heart rate sensor for arduino. Monitor heart rate and send data to arduino



Fig 8. Heart Rate Fingertip Module

OLED Display:

Newhaven Display OLED display modules are organic LEDs that offer brighter and more contrast displays with faster response times and wider viewing angles. These screens consume less power than conventional VFD, LED or LCD screens and are classified into OLED characters and OLED graphics. OLED displays automatically illuminate and do not require backlight for maximum visibility in all environments, which also allows them to be significantly thinner than standard screens. OLED displays have a built-in controller, a single low power source and are available in several color and dimension variants. In this gadget, OLED display of 128*64 resolution is used. Arduino takes data from sensor, GSM and GPS and sends to display.

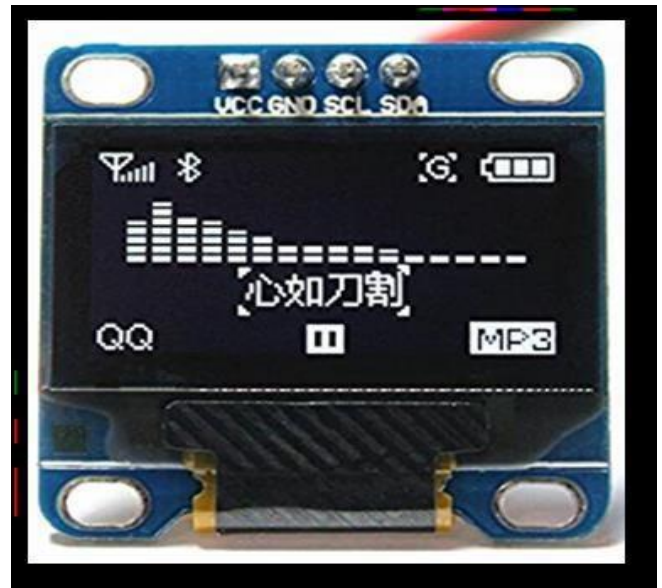


Fig 9. OLED Display

Battery:

Power bank is used to provide power supply.



Fig 10. Battery

Connecting Wires

Wires play an important role in this proposed system, as they connect all the components.



Fig.11 Connecting Wires

V. ACTUAL ASSEMBLY

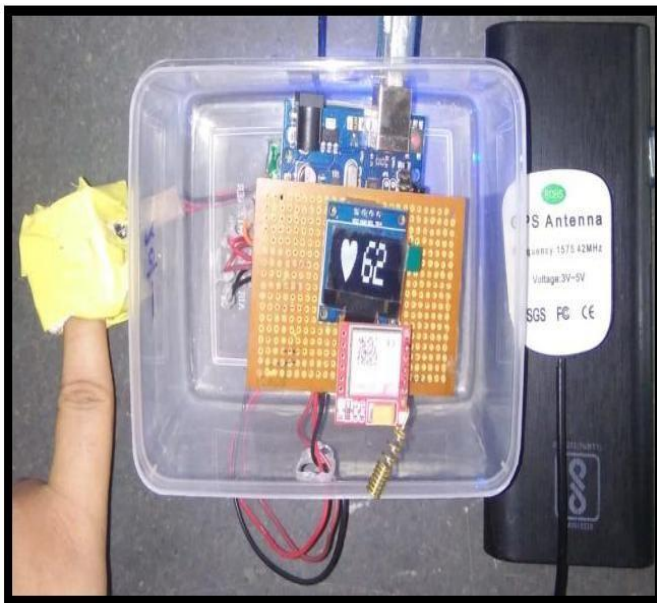


Fig 12. Actual Assembly

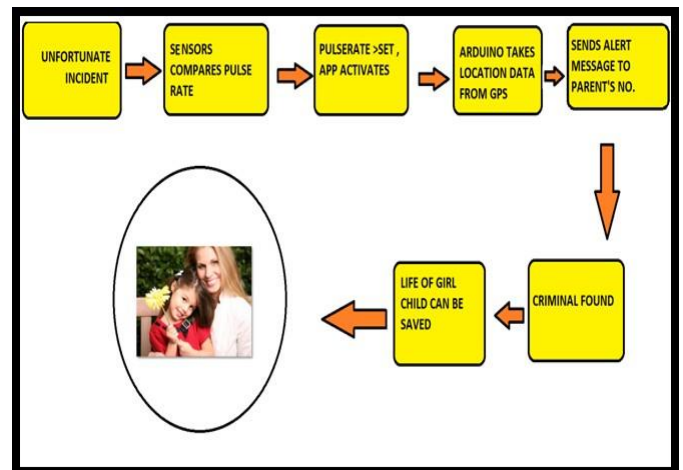
VI. WORKING

The gadget is incorporated with a wearable waist band and the sensor is in contact with the child's fingertip. The sensors continuously sense the pulse rate and send the data to arduino and arduino displays the pulse rate using display. Normal pulse rate of a child in the age group of 3-14 years is 70-80bpm. But when an unfortunate incident is happening with a girl child then the pulse rates get excited to 170- 180bpm. In program, the set upper pulse limit is set to 140bpm

and lower pulse rate limit is set to 50bpm. When the excited pulse rate crosses the set limit, arduino takes the location data from GPS and sends alert message with Google map location link through GSM to registered phone number of parents. By tracing the location, life of a girl child can be saved. Due to any reason, if the contact between sensor and child is lost, message will be delivered to parent's phone number. So the snatching of the gadget from the child is avoided.

VII. VI.CONCLUSION

The gadget made for the safety of girl child is simple and innovative. Also it is economical and provides security to girl child. This gadget acts as a connection between girl child and parent when she is out of their sight.



VIII. FUTURE SCOPE

This gadget can be modified in a portable wrist band after further optimization.

IX. REFERENCES

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