

Activity Tracker Wrist Band for Children Monitoring using IOT

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Abstract— Today in present world of digital technology and global computing every person is connected with each other in number of ways. In current global computing world, the children and women harassment, chain snatchings, kidnapping, sexual harassments, eve teasing, etc. are increased day-by day, becoming more unsafe and helpless. When these perilous situations occur there must be a trending technology to be comfortable to handle. So we are proposing a system that works on the controversy of children using IOT. In this project we proposed a device which is integrated with multiple devices, comprising of wearable “Activity Tracker Wrist Band” which is programmed with all the required data which includes the behavior of the human reactions like anger, anxiety, nervousness and fear. When these situations are faced by the victim, the various sensors generate the emergency signals which are to be transmitted to the smart phone. The system effectively monitors the children presence within the expected zone. When the person crosses the monitoring zone, then based on IOT Monitoring system, GSM sends help request by sending messages to the nearest police station, parents and the people in the near radius.

Keywords-IOT Monitoring system; GSM; smart phone ; messages; children..

I. INTRODUCTION

Internet Of Things is the network containing many physical devices, vehicles, electronic parts, software, sensors, actuators, etc. It mainly enables these devices to efficiently, intelligently connect these objects to collect the data and usefully exchange it for a purpose. The term IOT was first coined by Kevin Ashton in the year 1999

The Internet Of Things (IOT) associate to be sensed and connect remotely to monitor the already existing network and its infrastructure. The important vision of IOT has evolved due to a convergence of various technologies, including ubiquitous wireless communication, real-time analytics, sensors, embedded systems, etc. It is a technology that allows the objects to be sensed or controlled remotely across existing network infrastructure having numerous devices connected to it. These devices collect useful data with the help of various existing technologies and then autonomously flow the data between other devices. In today's scenario, over 80% of the world population habituated towards the new technologies developed, including the children by the usage of mobile phones, smart devices, laptops and others smart equipment's are also increased.

The key idea proposed in this project is based on an advanced technology that offers “Activity Tracker Wrist Band” safeguards the children. Now-a-days attacks on children, women, and elderly people have extensively increased in number and the victims are in perilous situations who cannot take the mobile phone to contact the police station or to the family members. This proposed system will be highly effective from other existing techniques in helping the victims. The children with Activity Tracker Wrist Band that has access to IOT monitoring and GSM technology keeps monitoring the children 24*7. The system has sensors interfaced with the processor which keeps sensing the vital signals such as heart beat rate, temperature, etc. So whenever some perilous situations arise there may be an indication to parents. Also when the person crosses the zone (say a school zone) unfortunately due to some harassment, then the system automatically sends the information to the parents, nearest police station informing the status of the problem occurred..

II. LITERATURE SURVEY

This existing system focuses on a wireless method which will send alert and communicate with a secure medium. The system here is based on smart phone which will be very much

useful in helping victims. It is not only informing about attacks but also in giving the exact location of the injured person to the nearby police station for necessary action. Women will be provided with smart band and the smart phone that has access to the GPS tracking mechanism that gets the location and these location values are displayed on the LCD. Also it sends the alert messages to the nearest police station and family members.

The Smart band is integrated with Smart phone and The GPS and the GSM can be used. The smart phone is connected to smart band watch through Bluetooth Low Energy (Bluetooth 4.0) module. The device communicates with phone through an application designed specially that acts an interface between the smart band and the phone. The data sent by the smart band such as the pulse rate, temperature of the body along with the motion of the body is monitored continuously by the specific application. In case of abuse, the app directs the smart phone to perform the upcoming actions like Sending message to the family members; Co-ordinates sent to nearest police station asking for the immediate action and also sends information to people in near vicinity requesting public attention. The help message is sent to the family members and the nearest police station through the GSM facility that is in built in the phone. The app is programmed in such a way that it uses the GPS of the smart phone to track the co-ordinates and monitor the movement for easy track ability. This feature is executed by using internet facilities of the phone of the user.

The 'Watch me' concept is designed in a way to secure women when they are exposed to external challenges and harassments in the society. Women safety by smart phone can be activated only by a touch or one click. It is impossible to have mobiles on our hand under all circumstances. In such situations this watch me concept can be used. It works automatically based on heart beat rate which increases due to the secretion of epinephrine hormone from hpa axis that is specifically defined for each and every situation like fear, anger, anxiety and other reactions triggering the sensors automatically. The basic concept is triggering the heartbeat sensor when it attains the targeted heart beat rate. Once the heart beat sensor gets activated it produces an alarm sound to alert the nearby people to grab their attention. Then the system immediately sends an alert signal to the nearby police station also. So that police can trace the location by GPS tracker which is updated. Then it also sends an alert message to the already saved emergency contacts list, so that they can get information that the person wearing 'watch-me' is under danger.

This woman security android application is designed to provide security and provide awareness on the time of critical situation for women. This proposed system is GSM & GPS Based women Security System. The main objective of security

system is to track the current location of the victim having an android enabled mobile by extracting the longitude and latitude of that target person. The GPS device is placed inside the device (Android Phone). An emergency button is fixed on the device at a particular position. Generally service is made active by clicking on ACTIVE SERVICE button. On clicking this, button service gets activated and clicking on VOLUME key a new window is opened and SMS is sent to those contacts saved already at the time of registration. The SMS contain alert message and the current location. Whenever women in any kind of trouble she can press the emergency button and an alert message will be immediately sent to the nearest police station. Then it is the responsibility of police cops or squads to handle the situation.

When the user touches the application, within few seconds the app will be executed automatically and turns on the camera in order to capture the images (victim's surrounding). The app picks up the user's GPS location (Current Location) exactly and shares it along with location to the nearest helpers (Ambulance, Police Station, etc.). The main feature of this application is that the helper will get the details of user (Image, address and personal information) in order to avoid fake details. The nearby helpers can be found using cloud crawling techniques according to the affected users. The system is designed to monitor children in a safe and non-intrusive way. It will use a combination of RFID, GPS (Global Positioning System) technology, and GPRS (General Packet Radio Service) technology. Each child is issued one or more unique RFID card(s) that are embedded in the school bag for each student. As the student's RFID tag is detected by the reader installed in the school bus upon entering or leaving the bus, information such as the time, date and location is logged and transmitted to a database for further processing. It requires no action on the part of drivers or students, other than to carry the card and will deliver the required performance without impeding the normal loading and unloading process. The system will allow the parents/ guardians/ caretakers to receive instant SMS alerts when bus is within 10 minutes of the designated pick up and drop off points reducing the time the child spends on the street. The system will also notify parents through SMS when the child boards and departs from the bus or enters/leaves the school. If a child is still inside the bus for a predefined time after the vehicle's engine is turned off, and doors are closed, an SMS message will be sent to the school authorities. In addition, the system will display the real-time location of the bus and the student inside the bus at any point of time. A Web-Based Reporting makes it fast and easy to access accurate information, which provides time and date for all the activities of student that provides all students ridership data by bus. In summary, the system will enable school authorities, fleet owners and parents to keep track of the bus online whenever required.

III. PROPOSED SYSTEM

The proposed system is based on an advanced technology that primarily safeguards the children that offers “Activity Tracker Wrist Band” based on particular zones within which they must be. This proposed system will be highly effective from other existing techniques in helping the victims. The children with Activity Tracker Wrist Band that has access to IOT monitoring and GSM technology keeps monitoring the children 24*7. The system has sensors interfaced with the processor which keeps sensing the vital signals such as heart beat rate, temperature, etc. So whenever some perilous situations arise there will be an indication to parents. Also when the person crosses the zone (say a school zone) unfortunately due to some harassment, then the system automatically sends the information to the parents, nearest police station informing the status of the problem occurred.

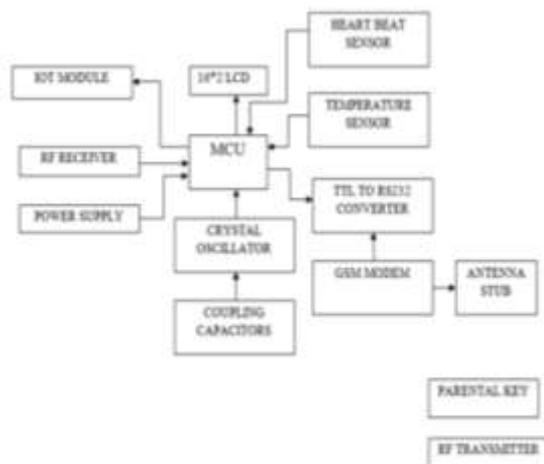


Figure 1. Wrist Band Section.

The system accomplishes the above tasks using the Microcontroller PIC16F887 as the processor core for the control mechanism of the whole system. It has two sections: 1) Wrist band section 2) Remote monitoring section. The wrist band section is the tracker band wearable on the children’s hand for the purpose of monitoring. The RF transmitter decides the zone by transmitting its RF frequencies and RF receiver is placed on the band. So that whenever the person crosses the particular monitoring zone the alert message is sent where the RF range is also crossed. The remote monitoring section comes with the facility of IOT based monitoring remotely for the children’s zone crossing due to some harassment.

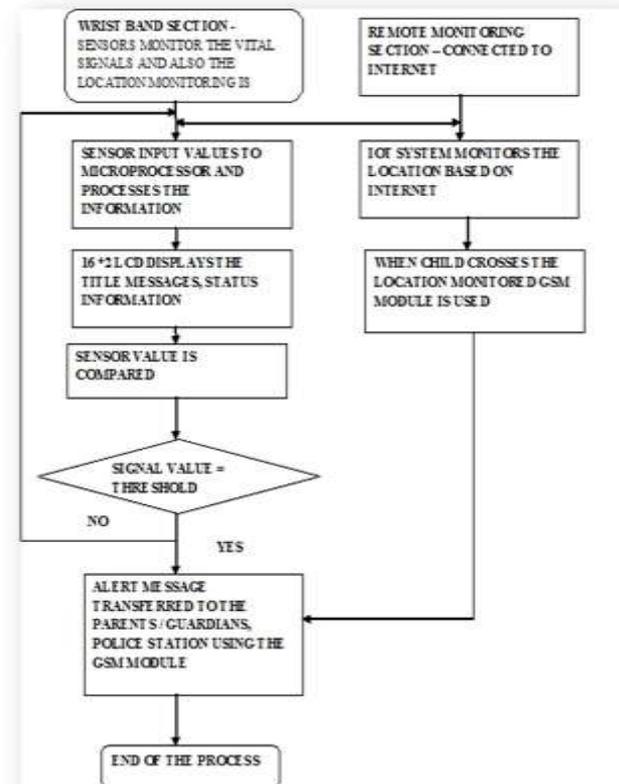


Figure 2. Flowchart of the monitoring system

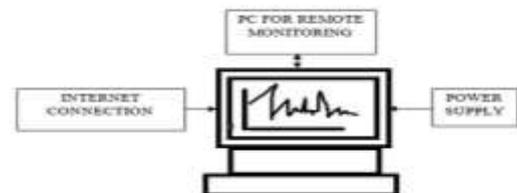


Figure 3. Remote monitoring system

IV. DESIGN METHODOLOGIES

The hardware prototype for the wrist band section is given below. The PIC16F887 as the heart of the system takes care of the peripherals interfaced to it. The part and peripherals of the module is clearly explained below.

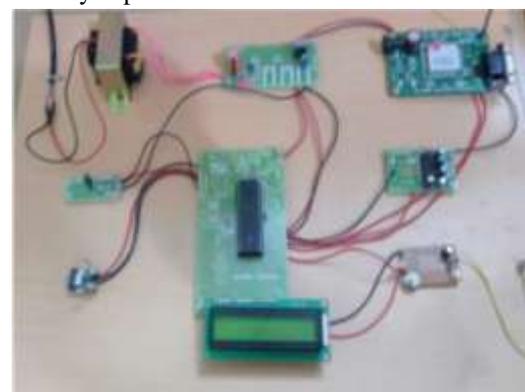


Figure 4. Hardware Prototype

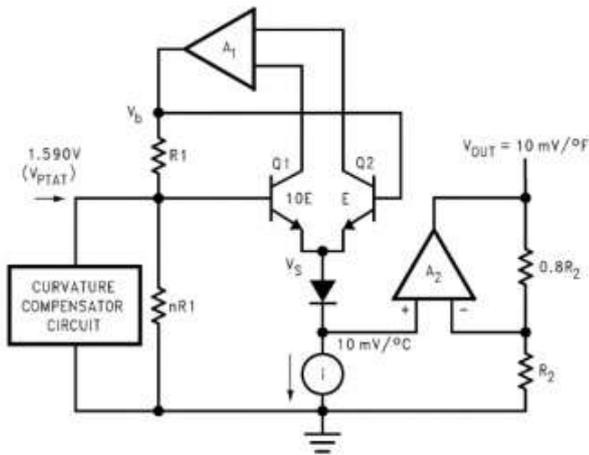


Figure 8. Working principle of LM35

There are two transistors in the above figure. One has ten times the emitter area of the other. It has one tenth of the current density, since the same current is going through both transistors. This causes a voltage across the resistor R1 that is proportional to the absolute temperature, and is almost linear across the range. The amplifier at the top ensures that the voltage at the base of the left transistor (Q1) is proportional to absolute temperature (PTAT) by comparing the output of the two transistors. The amplifier at the right converts absolute temperature (measured in Kelvin) into either Fahrenheit or Celsius, depending on the part (LM34 or LM35). The little circle with the "i" in it is a constant current source circuit. The two resistors are calibrated in the factory to produce a highly accurate temperature sensor. The integrated circuit has many transistors in it . two in the middle, some in each amplifier, some in the constant current source, and some in the curvature compensation circuit. All of that is fit into the tiny package with three leads.

V. RESULTS AND DISCUSSIONS

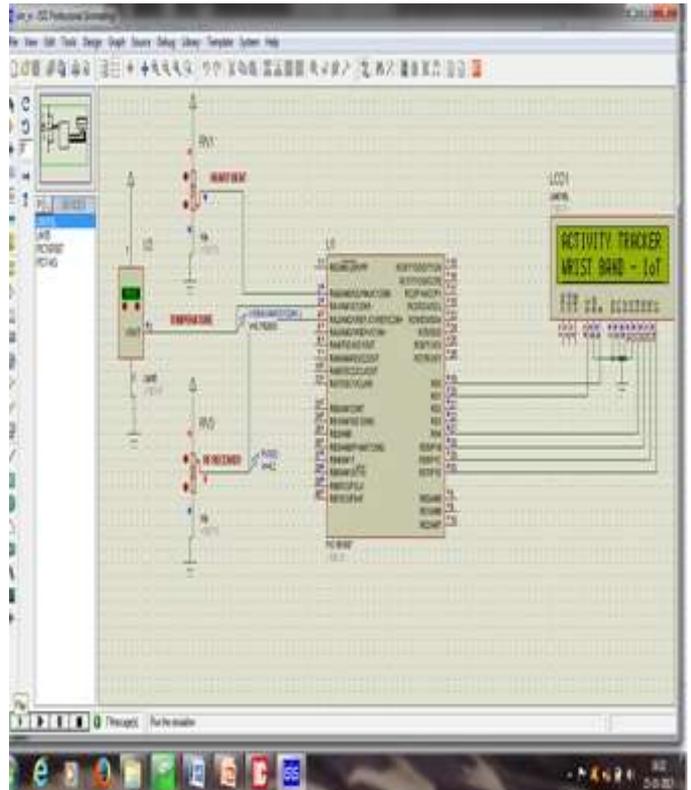


Figure 10. Simulation output for activity tracker

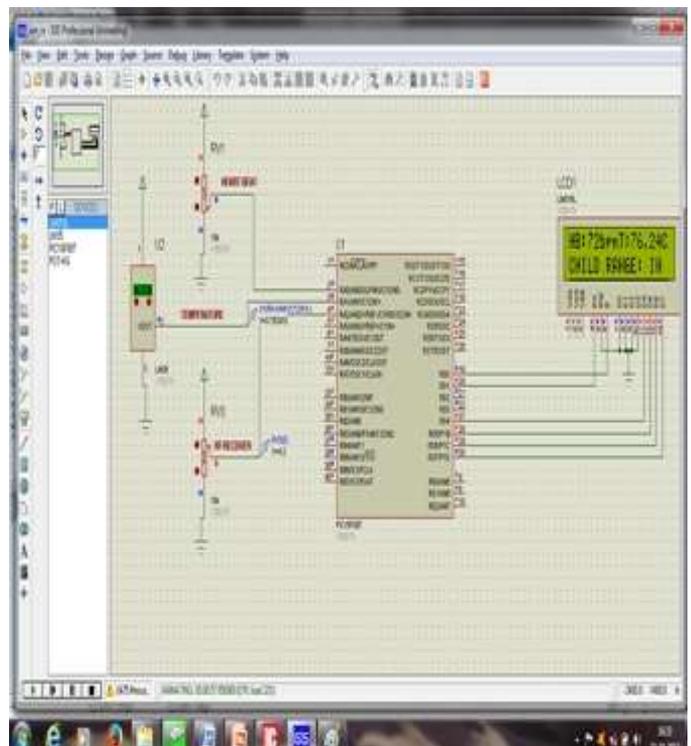


Figure 11. Simulation output for heart beat rate finding

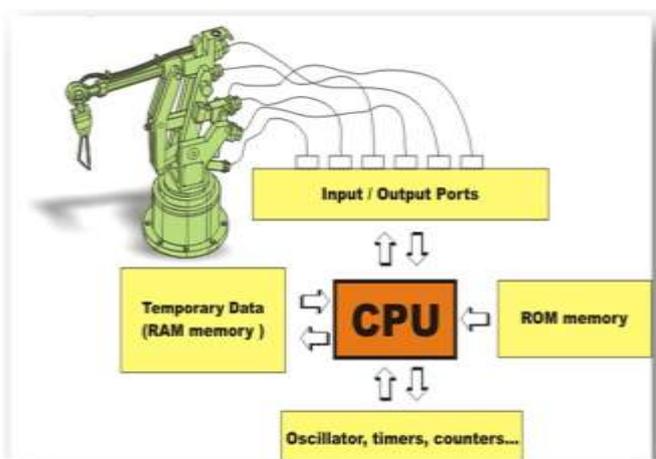


Figure 9. CPU Memory

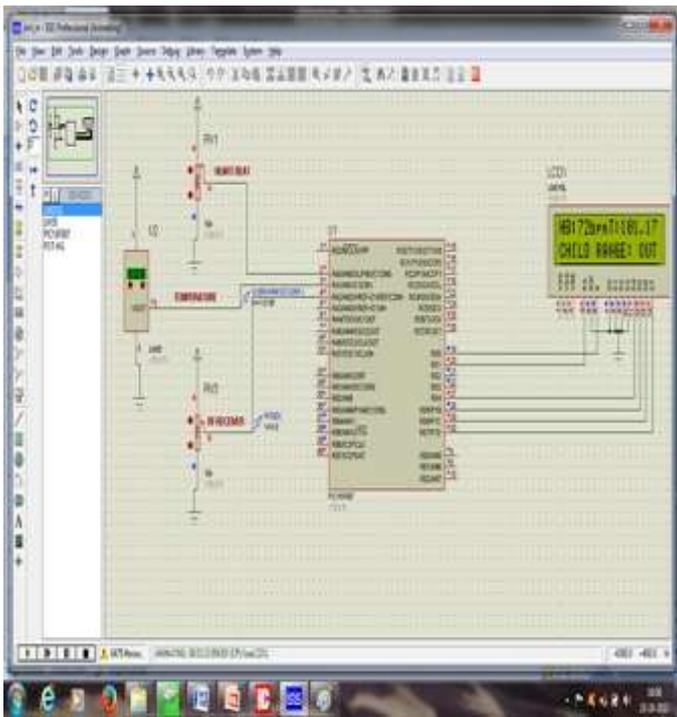


Figure 12. Simulation output for pulse rate finding

VI. CONCLUSION

The implementation of activity tracker wrist band system using IOT safeguards the children and it can also be effectively used for women, elderly people to protect them and safeguard in the fastest way which is possible automatically. This system mainly focuses on a wireless method which will alert and communicates with secure medium and can perform the real time monitoring of particular zone and detect the safety with safety accuracy. This idea can be implemented in different areas of security around he school zones, institutions, shoppingzones, where facing perilous situations happens

because of attacks. This system would be highly sensitive and easy to handle. Its quick action response will provide better rescue to every individual user.

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