



e-ISSN: 2278-8875

p-ISSN: 2320-3765

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 9, Issue 12, December 2020

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.122

9940 572 462

6381 907 438

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IoT and Machine Learning Based Smart Women Safety Device

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ABSTRACT: According to the reports of WHO, NCRB-social-government organization 35% Women all over the world are facing a lot of unethical physical harassment in public places such as railway- bus stands, foot paths etc. This project describes about an one touch alarm system for women’s safety using IBEACON and GSM. This helps to identify protect and call on resources to help the one out of dangerous situations. Anytime you sense danger, all you had to do, is hold on the panic switch. The system is a normal wearable device which when activated, tracks the place of the women using blue tooth low energy and GPS and sends emergency alert to police control room.

KEYWORDS: GPS, MEMS Sensor, Arduino, IBeacon, Shock Wave Circuit, GSM, Gyroscope, Panic switch.

I. INTRODUCTION

Women safety is a very big concern in a country like INDIA where women are playing an outstanding role in each and every field. India is a peace loving country and one of the safe destination for the tourists across the world. However, a few incidents in recent past brings to attention that there is a need for women safety. Many women’s in developed countries still fear to go outside alone due to number of cases of violence against women. To make women safety safer many attempts have been made but, still a safer and secure system is needed that can ensure safety during public transport and in general. This, paper presents a system that is capable of providing more security and safety.

II. LITERATURE SURVEY

The paper [1] proposes a safety device and application called FEMME using ARM controller. It is a security device which is specifically designed for women. The device and be purchased or the application can be installed in smart phones and can be accessed in emergencies. FEMME provides quickest and easiest way to contact for help, when a person is in distress. The application is activated by pressing the volume key and the power button together.

The paper [2] proposes a device which is portable and it also resembles a belt. This device was developed after seeing few applications and devices such as VithUapp which was initiated by a popular TV series Gumrah aired on channel [V], SHE(Society Harnessing Equipment) which generates current to help victim escape, and ILA security founder designed an alarm that can shock and disorient attackers. This device includes Arduino board, GSM shield, GPS module, screaming alarm and pressure sensors. The arduino board consists of everything which requires to start up the microcontroller, it can be started by connecting it to a computer or powered with an adapter or even a battery. The GSM shield provides data, voice, SMS and fax in a small form factor with low power consumption. It is a very powerful single chip processor with high efficiency and speech quality and it supports low cost handsets and is also compatible with almost all telephone services.



The paper [3] proposed a system consists of wearable safety device having an emergency button for sending notification and camera for capturing assaulter image, thus location of the victim is traced with help of GPS and image gets captured. So they refined a wireless portable women safety device and school bus tracking system consisting of emergency press button for alert purpose and electronic camera for capturing image of that instance. GSM system traces the current location of the victim and sends alert messages and the embedded camera obtaining the image.

The paper [4] conducts a survey of 10 papers which are on women safety and security. It categorizes the technologies used in the papers into three categories and list outs the disadvantages of all and proposed a model which included the features of all the technologies and added few more to them to overcome disadvantages and provide a better security system for the women.

III. PROPOSED SYSTEM

To make women safety safer many attempts have been made but, still a safer and secure system is needed that can ensure safety during public transport and in general. This, paper presents a system that is capable of providing more security and safety. Here the MEMS sensor is used to sense any mishappening with women according to the extraordinary movement of body. If in any case MEMS sensor is unable to sense the mishappening then the switch in the watch can be pressed manually to indicate any mishappening. As soon as any mishappening is detected by the sensor the same is indicated to controller. Upon receiving the signal the controller starts generating shock waves through shock wave circuit and at the same time a message containing location of the victim obtained through GPS is transmitted to the relative or friend whose number is already in the program.

The proposed model included. i) Auto receiving call module - it helps to receive the call from registered contacts on the victim's safety device. ii) Spy camera detection module - which helps to detect the spy cameras in the changing rooms of shops and other places. iii) Fake call Tool Module- which helps in creating a fake incoming call which in turn helps women to escape from a bad situation, it acts like a precautionary measure. iv) Generate Electric Shock module - it helps in creating a high voltage electric shock which acts as a self defence device when women is in a threat.

New RSSI bluetooth technology[5] uses low cost Bluetooth Low Energy signalling to enable micro-location services and to trigger actions within apps. A woman with a mobile phone only needs to pass by the bluetooth signal to be tracked by an application. This technology is used to provide safety tracking of women and young people.

IBeacon technology used to track and "checkin" on women and children in urban environments with automated low cost bluetooth devices. Women and young people [6] who can be tracked easily in an urban environment, law enforcement will can access information quickly, families who want to "checkin" on their loved one's travelling globally. The sensor continuously monitor the physical status of the women through sensors, if the threshold value changes to abnormal then the location is sent to the control unit, similarly if the panic switch is pressed the signal sent to the control unit.

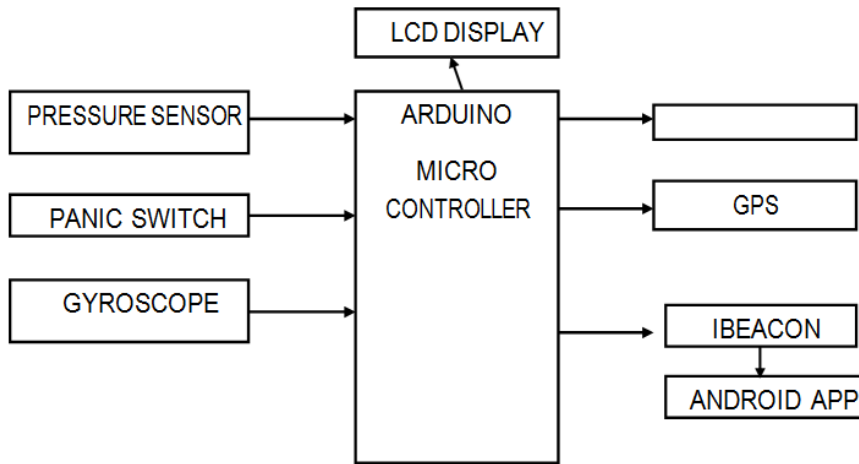


Fig. No.1. Block diagram of proposed system for women safety

A **gyroscope** is a device for measuring or maintaining orientation, based on the principles of conservation of angular momentum. A mechanical gyroscope is essentially a spinning wheel or disk whose axle is free to take any orientation. This orientation changes much less in response to a given external torque than it would without the large angular momentum associated with the gyroscope's high rate of spin. Since external torque is minimized by mounting the device in gimbals, its orientation remains nearly fixed, regardless of any motion of the platform on which it is mounted.

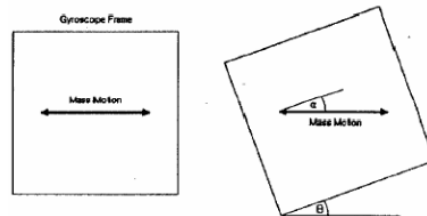


Fig.No.2.Angle Measurement

The design for angle measurement is based on the principle of measuring the angle of free vibration of the suspended mass with respect to the casing of the gyroscope. The mass is given an initial condition so that it vibrates in a know direction. The angle, θ , in the global frame can be calculated by keeping track of the direction of vibration if the mass in the local frame, given by the angle α , as shown in Figure. When the gyroscope is rotated in the global frame the mass continues to vibrate in the same direction with respect to the global frame

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on a computer, used to write and upload computer code to the physical board.

IV.SOFTWARE REQUIREMENTS

Embedded C is a set of language extensions for the C Programming language by the C Standards committee to address commonality issues that exist between C extensions for different embedded systems. Historically, embedded C programming requires nonstandard extensions to the C language in order to support exotic features such as fixed-point arithmetic, multiple distinct memory banks, and basic I/O operations



V. RESULT AND CONCLUSION

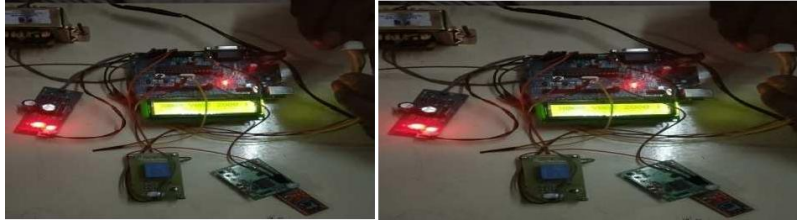
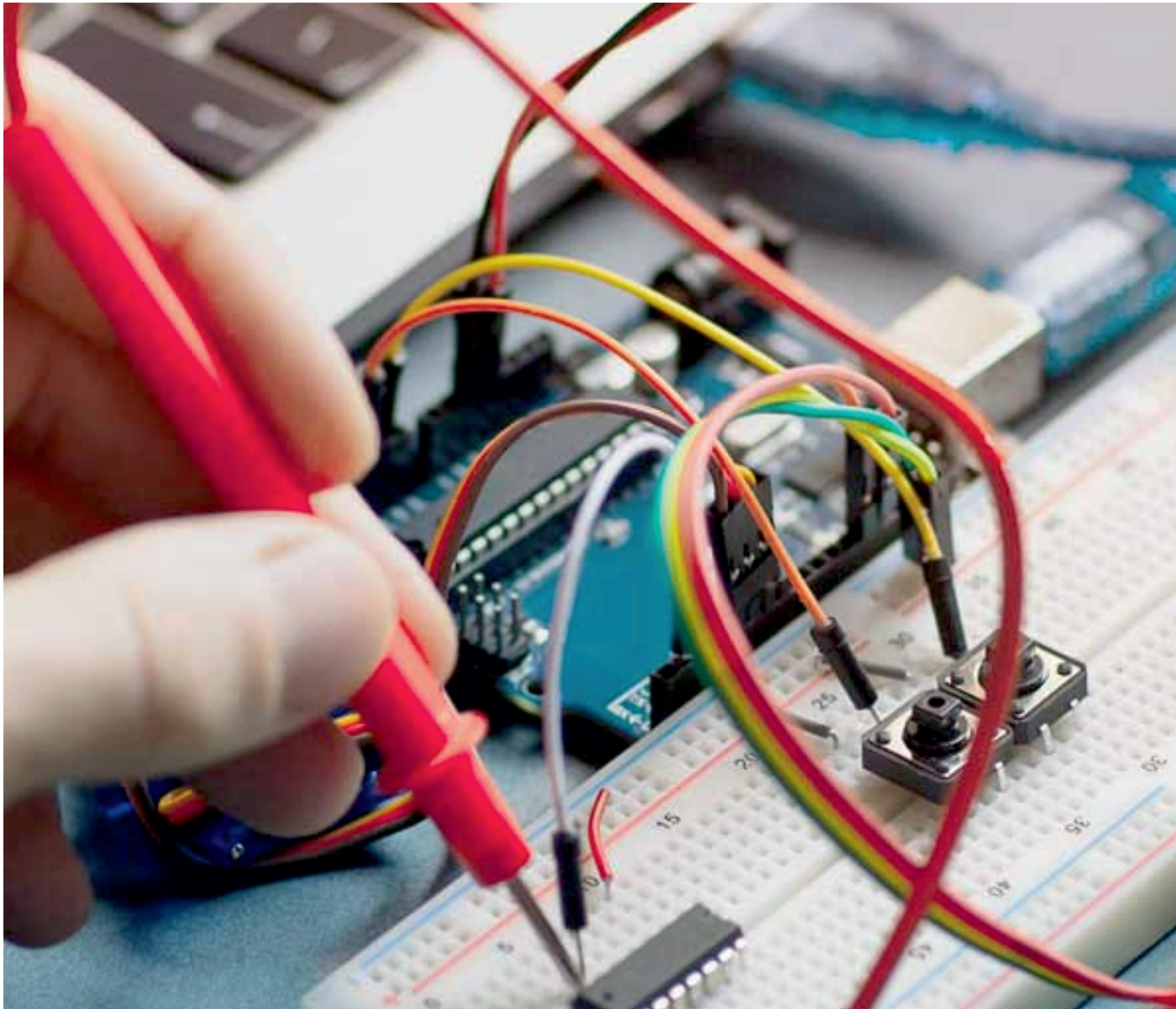


Fig.No3..Photocopy of IoT based smart women safety system

Thus our proposed women safety system provides safety during dangerous situation by either operating the sensor manually or automatically using MEMS sensor by abnormal body movement. So it is advantageous though they cannot operate manually it will start working itself. The additional option is also included to provide electrical shocking effect to the unknown person which will further help them to protect themselves. Further the message also conveyed to the concerned person about the location of the victim through GPS immediately. Though they went to unconscious state, our system will help to track the person easily and quickly. Thus our project is used to safeguard the person with or without their interruption in critical situation.

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