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Survey on techno level obstacle sensing using ultrasonic based services

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ABSTRACT

Along with a fast growing economy of a developing country as far as India is concerned, there has been reported a emerging number of harassment and criminal offences against disabled women. In many of the cases the suspects are quite freely escaped due lack of communication links in time. Our goal is to design a intelligent device which can alert the authorities when any harassment is happening. Our system requires minimum power consumption and least human efforts. Initially it sends a signal to the nearest traffic control or police station intimating the state of crime along with its location. The processor chosen to be is the Arduino UNO, and the communication to the police control is done using GPS and GSM technology.

Keywords: GPS (Global Positioning System), GSM (Global System for Mobile communication), Arduino UNO.

1. INTRODUCTION

In the current scenario there is a highest priority issue of Women security. Government has provided security through rules and regulations to society. There are different aspects, areas and scopes of women security. Recently Security concern is a major problem. Now-a-days Women are facing problems like Molestation, etc.. Women security issue has become a most important. Women security system topic has been chosen by considering so many issues, aspects, areas, need and problems. Women security system has considered for providing solution to different problems.

Sexual abuse, also referred to as molestation, is usually undesired sexual behavior by one person upon another. It is often perpetrated using force or by taking advantage of another. When force is immediate, of short duration, or infrequent, it is called sexual assault. The offender is referred to as a sexual abuser or molester. The term also covers any behavior by an adult or older adolescent towards a child to stimulate any of the involved sexually. The use of a child, or other individuals younger than the age of consent, for sexual stimulation is referred to as child sexual abuse or statutory rape. Today, in the current global scenario, Women were facing lot of challenges. We can hear the news of women harassments than their achievements. There are many existing apps and devices for women security via smart phones. Though the smart phones have increased rapidly, it is not possible to have the phone all the time in our hand to make a call or click on it, so here we introduced a new technique via smart belt. When a women or child wearing this is exposed to sexual or vulnerable attack, the sensor present in it detects the distance of a person who is going to attack the victim, during which the distance will be minimum between the victim and the person who attacks and hence the device gets activated, this will not only provide a alarm sound to the attention of nearby people, it will automatically make an call to our registered contact and also through GPS/GSM it will detect the nearby police station and make an ring there so it will be helpful for police to arrive soon at the spot by tracking the GPS, such a system will lead to safer and better environment.

Recently a 23 year old blind student, who also works part time, has alleged that she was molested by an unknown man while she was in train. She said nobody came to rescue her.

The Important part of the project is prevention of incident and communication through wireless medium. In the molestation security alarm, prevention will be the highest event and communication is second. The basic principle for this molestation security alarm is prevention in communication by using ultrasonic sensor and GSM Technology. Hence the project is divided into two parts:

- Prevention of incident
- Communication of that incident through wireless.

To prevent the above mentioned accidents various techniques are being used such as spray model, Automatic shocking system, etc., In this project SMS information will be sent to the concern people.

2. LITERATURE REVIEW

J. Yang et.al [1] introduced, “Activity recognition based on RFID object usage for smart mobile devices,” in *Journal of Computer Science and Technology in 2011*, which involved a RFID sensor to support workrate of a person used in places like marts. Uses Reverse Makrov algorithm. Its main issue is in the detection process because of the range.

F. Attal et.al [2] introduced “Physical human activity recognition using wearable sensors,” *Sensors*, vol. 15, no. 12, pp. 31314–31338, 2015, where motion of the players are recognized through sensors. Used in Simulations only. Can work in a room with required technology.

M. Janidarmian et.al [3] introduced, “A comprehensive analysis on wearable acceleration sensors in human activity recognition,” *Sensors*, 2017 where human movement can be detected through sensors like RFID for human security purposes. Range is a main issue

M. Cornacchia et.al [4] introduces, “A survey on activity detection and classification using wearable sensors,” *IEEE Sensors Journal*, , 2017. where a statistical research on human mactions are monitored through different types of sensors with different success rates.

S. Mukhopadhyay [5] introduced, “Wearable sensors for human activity monitoring: A review,” *IEEE Sensors Journal*, , no. 3, pp. 1321–1330, March 2016 where sensors are positioned on human skin to make it unnoticeable by humans. Used for military applications. Problem is it wears out and affects health of user.

S.NO	AUTHOR	TITLE	TECHNOLOGY USED	RESULT	ISSUES
1	J. Yang, J. Lee, and J. Choi	Activity recognition based on RFID object usage for smart mobile devices	RFID, Wi-Fi, and ultrasonic sensors used.	Provides monitoring information on products and type of customer in marts.	Range is a major problem. Works for RFID and not for other sensors
2	F. Attal, S. Mohammed, M. Dedabrishvili, F. Chamroukhi, L. Oukhellou, and Y. Amirat	J Physical human activity recognition using wearable sensors	Ultrasonic Sensors ,GSM ,GPS ,Wi-Fi, Reverse Makrov Algorithm	Provides the type of action based on the movement of joints connected to the sensor.	Data Sparsity is a major issue.
3	M. Janidarmian, A. Roshan Fekr, K. Radecka, and Z. Zilic	A comprehensive analysis on wearable acceleration sensors in human activity recognition	K-means algorithm, Accelerometer, EMD method	Provided the position and prediction of human positions based on EMD method. Provided 62% success rate	The location activity matrix extracted from GPS trajectories is sparse.
4	M. Cornacchia, K. Ozcan, Y. Zheng, and S. Velipasala	A survey on activity detection and classification using wearable sensors	Eddy current sensor, GSM, and Location Monitoring Algorithms.	Provided working of the sensors and provided different range variances	finding the optimal type of sensor varies for various task.

5	S. Mukhopadhyay	Wearable sensors for human activity monitoring	precise algorithm, Location based Algorithm.	proved that Location Still Matters for areas like hospitals.	Sensor product would wear down and needs to be replaced which costs a lot.
6	O. D. Lara, A. J. Perez, M. A. Labrador, and J. D. Posada	Centinela: A human activity recognition system based on acceleration and vital sign data	Geographical Information Systems (GIS) Techniques,Ultrasonic Sensor	Monitors human health condition whenever possible and offers emergency information.	Issues arise when false alarm occurs.
7	N. Capela, E. Lemaire, N. Baddour, M. Rudolf, N. Goljar, and H. Burger	Evaluation of a smartphone human activity recognition application with able-bodied and stroke participants	Using RFID Sensor,GSM,GPS,Reverse Makrov	determined the relationships among different activities for various monitoring human actions.	Draining of power and accuracy of results.
8	O. D. Lara and M. A. Labrador	A survey on human activity recognition using wearable sensors	Electric transducer, GPS, GSM.	Providing range of different transducers in tracking position of people.76% efficient	Affect the prediction accuracy (e.g., the location sensors' natural error).
9	A. Y. Yang, R. Jafari, S. S. Sastry, and R. Bajcsy	Distributed recognition of human actions using wearable motion sensor networks	Precise algorithm	Provides situation of people in different areas based on location tracking mechanism.	Providing Real time support is difficult.

3. SYSTEM ARCHITECTURE

Here the device is carried by the person herself so that the person can feel secured at all the times. The device includes a ultrasonic sensor which measures the distance between the person who wears it and the person who is trying to molest. It also includes a buzzer which raises an alarm so that the people nearby can help the victim. The person can switch off the device, if trusted people comes in contact with them.

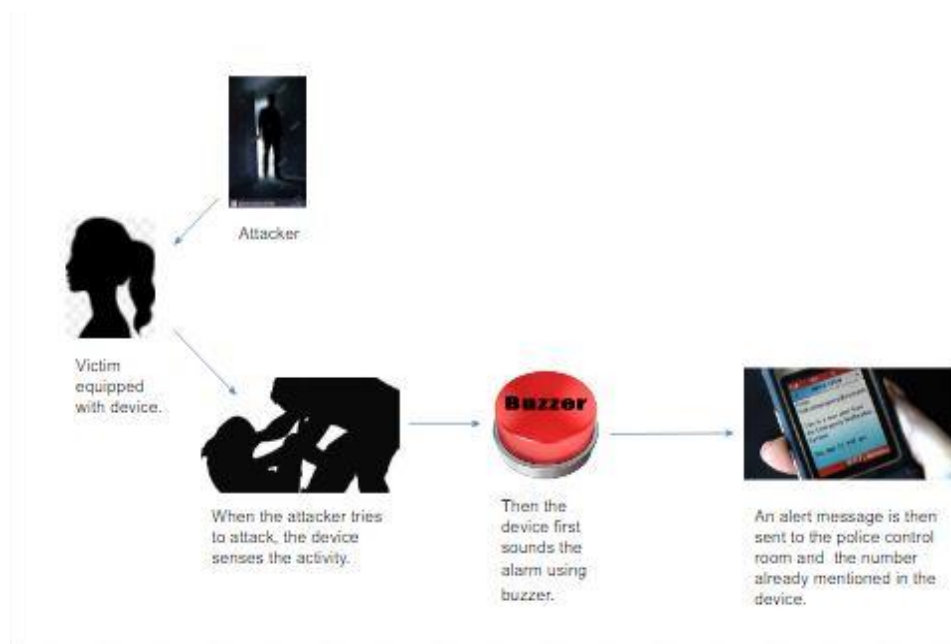


Fig. 1. System architecture of proposed system

4. PROPOSED METHOD

The molestation security alarm is a special device invented for the prevention of a women especially for the blind. The ultrasonic sensor is programmed in such a way that it detects the object at a distance of 4cm and triggers only when the both objects remains constant for 20secs. When the blind women is being attacked by the culprit then by calculating the distance between the victim and

the culprit the LED glows off and the buzzer produces a beep sound with the delay of 10sec. A registered SIM card is inserted into the GSM module and also the receiver number is also registered in the program. As soon as the buzzer produces a beep sound a message will be sent simultaneously to the registered number along with the location as GPS is inserted so that the person can come to her rescue. The buzzer sound is the alert signal for the neighbor that the victim is being attacked by a culprit. This device is designed especially for the physically and mentally disabled women who cannot communicate the situation correctly. The device is very useful for the beneficial of the society as it protects the women in every way. The important part of the system is prevention of incident and communication through wireless medium. A Security system in which prevention will be the highest event and communication is second event. Prevention and communication is the aim of this molestation security alarm.

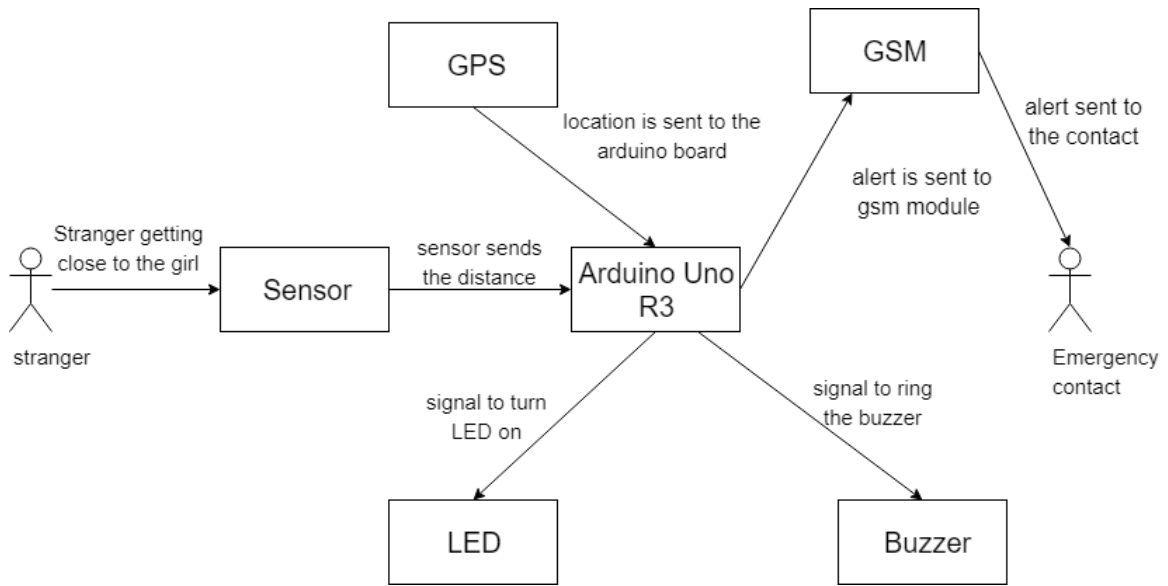
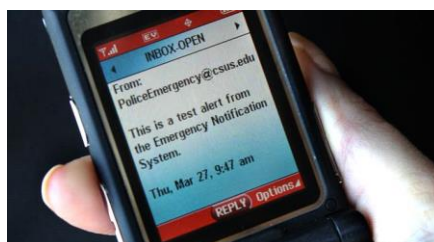
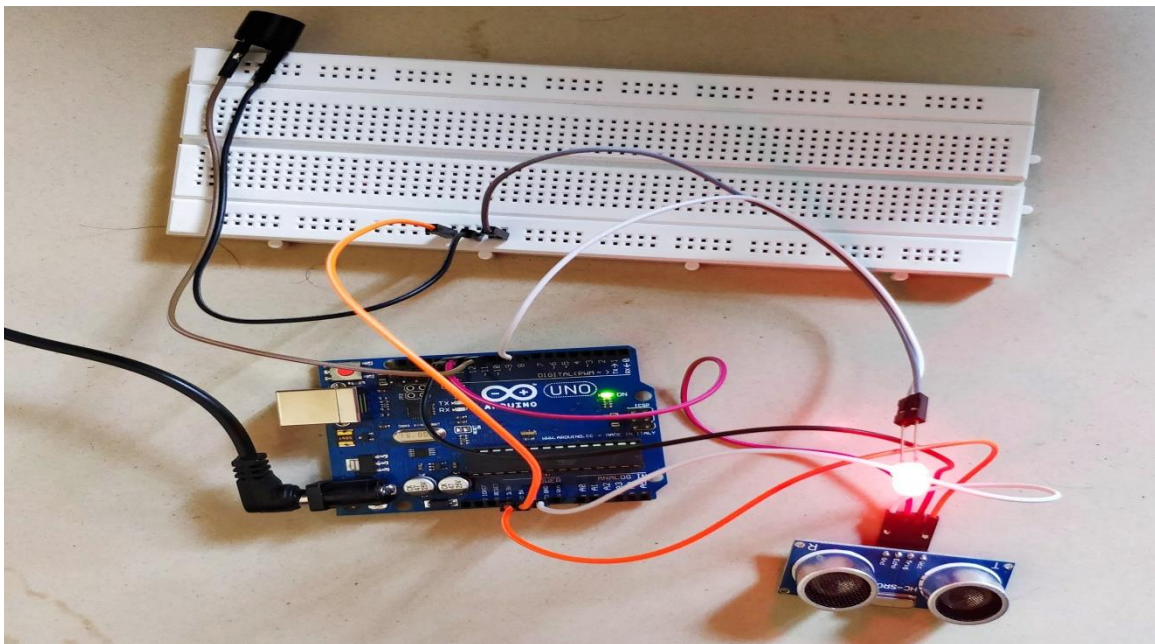


Fig. 2 Functional Architecture of proposed system

5. RESULTS



6. CONCLUSION AND FUTURE WORK

Automatic identification of daily life activities can be used for promotion of healthier physical activities and lifestyle. There are many inexpensive wireless motion sensing devices or one can be assembled using off-the-shelf hardware components. These sensors can be used to make small wearable devices and collect motion data for monitoring regular human activities. The women security alarm is a helpful tool to have self-defense for women. There are chances to reduce crimes against molestation, murder etc., By using this system prevention of incident is been carried out by beep sound or buzzer indication, will be helpful to prevent that violence rather than communication. Communication through GSM and GPS Technology is supplementary part to help the person. This system will also be helpful not only for the physically disabled people but also for the people who are in remote area. Women security system has been chosen by considering so many issues, aspects, areas, needs and problems. Women security system has considered for providing solution to different problems. The important part of the system is prevention if incident and communication through wireless medium. In this security system prevention will be the highest event and communication the second event. Prevention and communication is the aim of women security system.

This is only a small leap in the path to making the chances of survival higher; improving the lives of women. This can be extended to include a number of other advantages and benefits. It can be integrated with the established EVA system that is currently being used, which involves converting the web application into a mobile application making connectivity a lot easier. The work can be extended for the detection of increased heartbeat and also the identification and labeling of the specific region that has been affected in the output of the system.

7. REFERENCES

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