

## SMART SOLUTION FOR WOMEN SAFETY USING IoT

A.Jesudoss,  
Assistant Professor,  
School of Computing  
Sathyabama Institute of Science  
and Technology, Chennai,  
jesudossas@gmail.com

Y. Nikhila  
Student  
School of Computing  
Sathyabama Institute of Science  
and Technology, Chennai,  
nikhilareddy1409@gmail.com

T. Sahithi Reddy,  
Student,  
School of Computing  
Sathyabama Institute of Science  
and Technology, Chennai,  
tsahithireddythappeta@gmail.com

### **ABSTRACT:**

Now-a-days women are facing many problems based on their security. The application which is proposed has access to track location and will send messages to the nearby police stations and the scanned phone numbers. This application is not only used for cases like rapes and any perverts teasing girls but this also helps them from any bad condition or any health problem like fainting suddenly. GPS is to track the location of the victim and to send messages, the location of the victim to the nearby police station and the phone numbers of the relatives of the victim. This application helps women to overcome their fear in going out and do things what they like to do.

Keywords:- Internet of Things, Women Security, Body sensors, Arduino, Raspberry pi, GPS.

### **INTRODUCTION**

Physical devices through which all electronic devices is called the Internet of Things, cloud computing and sensors are connected. The privacy is very high in the Internet of Things. It is very helpful to people to develop a smart-based security. The sensors are developed in such a way that there is a automatic response without any triggering buttons. This can help people can overcome difficulties like women security, constructing smart city.

Multiple sensors like flux sensor, vibration sensor, tilt sensor, heartbeat sensor and GPS are used for safety purposes. The GPS is used to identify the location. Heartbeat sensor is used to identify the heartbeat level, IOT is used to send the location and message to nearby police station if there is any high

change in the heartbeat level. If any harassment , there may be chances of bending, inclinations, vibration and any bending are noted by tilt sensor, if there are different changes than the message is sent. Arduino, Raspberry pi3 are used in the proposed system.

The application proposed gives the security system which is designed to help women to do their work with comfort and can to the places they wanted and work with comfort. Body sensors and GPS is used to track location and send messages to nearby police station and relatives.

### **LITERATURE SURVEY**

Orlando pereira, et al (2010) proves the theory of using body sensors by using Network mobile solutions for biofeedback monitoring. The SHIMMER firmware and bluetooth firmware has been implemented in this work. The limitations of this work is bluetooth should be always connected to phone, it cannot be used if phone is lost[1]. Mirjam Jutila, et al(2014) proves the new concept of a wearable sensor vest for children. Safety vest Design, Gateway Implementation, Sensor web elements has been implemented in this work. The limitations of this work is the device used is very big in size, it cannot be carried to places all can go [2]. Samuel Tanga (2016) proves the concept of sensors in his work" Development Of Prototype Smart Home Intelligent Lighting Control Architecture Using Sensors Onboard A Mobile Computing System" . "Luminaire controlled by the Arduino microcontroller" has been implemented. The limitations of this concept is wifi or internet is needed to work the application[3]. Threats in Information Security are life-threatening more particularly in

medical field. [4]. Software providing more features and more security leads to increased execution time and also leads to poor usability of the software [5]. The application can be secured with fingerprint authentication for providing more security and to avoid false positive [6]. The Dynamic Cognitive System shows how the application can be protected against vulnerabilities and attacks in the social network [7]. Parthsethi et al(2018) proves the theory of using alarm system in his work published in "Safe sole Distress Alarm system for female security using IOT". "Central controller, GSM module, GPS module gesture control System, smart phone connecting". Limitations of this work is the click in a mobile is needed there is no automatic detection[8]. Phooshkar rajiv et al(2016) proves the theory of using "Email in email based Remote access and surveillance system for smart home infrastructure". "The Email from embedded system to user and reply processing has been implemented in this work". The limitations of this work is the application is very costly and GPS and GMS are not used[9]. Enji Sun et al(2011) proves the concept of IoT and cloud computing in his work "IoT and cloud computing based dam monitoring and alarm system in mines". The limitations it is not automatic. It should be switched on by external activity[10].

Zhen yan et al(2014) proves the theory of using Internet of Things in his work .A system model of Internet of things has been implemented in his work. The limitation of this work is poor in work and setup takes a long time[11]. Alessio Botta et al(2015) proves the theory of integration of cloud computing and Internet of Things: A survey. RFID and wireless sensors, cloud computing has been implemented in this work. The limitations of this work is that the system is very poor in working. It is very costly to afford by poor people[12]. Luigi Atzori et al(2012) proves the new concept of social Internet of Things in his work . He claims how cloud and Internet of things are integrated. The limitations of this work is how the system works is not clearly mentioned[13]. S.Sicari et al(2014) proves the new concept of "security and trust in the internet of things" in his work. He claims that security, trust, privacy and authentication has been implemented in this work. The limitations of this work is security and authentication of the Internet of things is showed,

but how sensors are connected is not showed[14]. Andre Gloria et al(2017) proves the new concept of IOT gateways in his work. The concept of IOT gateways, multiple communication protocols has been implemented in this work. The limitations of this work is a lot of hard work is needed to implement this and the application is also very costly to be implemented[15].

Carolyn Whitzman et al(2009) proves the new concept of women's safety in his concept .He claims that there should be some safety measures that should be taken by the women in the society. The limitations of this work is only the security of women is discussed, but the device has not been implemented[16]. Minchen et al(2016) proves the concept of smart clothing, in his work "Connecting human's report with clouds and big data for sustainable health monitoring". Intra smart clothing system , communications for Inter smart clothing sustainable health monitoring for chronic diseases has been implemented[17].

Mandeep Singh (2015) proves the wireless integrated device in "AN IoT security model design and validation of Android based wireless Integrated device for health monitoring. A device for body parameter measurement with the set of measuring algorithms and the mobile phone to increase tele medical capacity" has been implemented. Limitations of this concept is this an android application and the victim cannot be in a position to open phone and click on the application for help [18]. Susana P.Costa(2015) proves the concept of wearables in his work "Integration of wearable solutions in AAL environments with mobility support. AAL, wearable solutions for a mobile environment" has been implemented. Limitations are, although it is a wearable device, it just needs a click to activate the wearables [19].

John Ayoade (2007) proves the concept of RFID in his work "Roadmap to solving security and pure concerns in RFID system. Supply chain effectiveness, waste disposal has been implemented[20]. Rolf H. Weber(2010) proves the concept of privacy and security in his concept. Data protection, RFID, IOT has been implemented in this work. The limitations of this work is how IOT is

protected is described but implementation has not given[21].

**MOTIVATION**

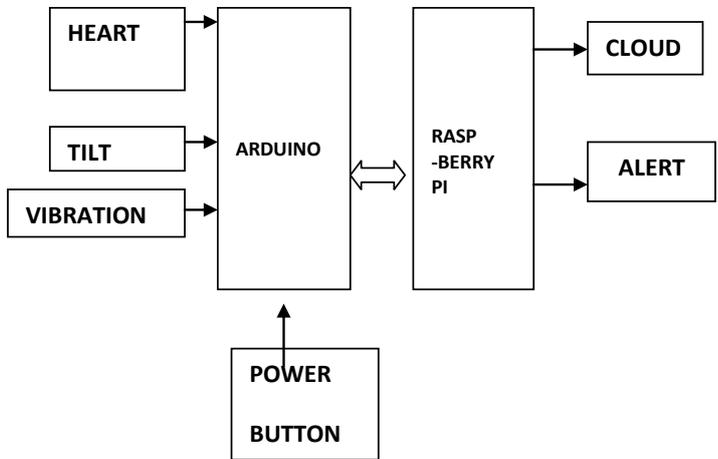
The challenging situations facing by each women now-a-days gave motivation to come up with a security device to help the women to do the work they liked to do. The application helps women to over come their fear and can roam freely and complete their works.

**PROPOSED SYSTEM**

Multiple sensors are used such as heart beat sensor, flex sensor, tilt sensor, vibration sensor is used to detect the heartbeat, declination, vibrations of women.

Heartbeat sensor is connected to the Arduino. The range of heartbeat is adjusted using Arduino c software. Tilt sensor is also connected to Arduino-uno board to get if there is any declination. Vibration sensor is also connected to Arduino-Uno board to notes the vibrations, ( if there is any different or abnormal vibrations ). The readings are noted for every 20 milliseconds delay.

Arduino-uno board is connected to the power button and raspberry pi3. GPS is fixed raspberry pi. GPS is used to track the location of the women.



**ARDUINO**

Arduino is a micro controller to which sensors are connected. It can be purchased either online or in any stores. Arduino looks like a credit card sized board. There are many versions of arduino. In this application arduino-Uno board is used. BY using cable Arduino board is connected to laptop to get power. Arduino -UNO board is used in this application.

**RASPBERRY PI 3**

Raspberry pi is a series connected credit card sized microprocessor. There are different types of raspberry pi. It has a high speed connection compared to other raspberry pi and it has storage up to 1 Giga Byte. It is set in a way that the health condition of the person who wears this device is noted and stored in the cloud for every 20 milliseconds It is a micro processor to which GPS is connected and every record of health condition of women is noted and stored in the cloud and if there are any variations or any severe conditions the GPS sends the messages to the nearby police station and relatives.

BLOCK DIAGRAM:

**HEARTBEAT SENSOR**

Heartbeat means the heart contracts and expands while pumping blood, the sound is heard while doing. The average heartbeat range for human is 72 per minute, if heartbeat rate is too low it means there may be any bad health condition, high heart beat rate, then there is a big tension faced by the victims. If there is a heavy change, the record of women is taken for every 20 milliseconds then the messages are sent to the nearby police station.

#### **VIBRATION SENSOR**

Vibration sensors are used for touch and vibration measurement. whenever a women moves, there will be acceleration. A vibration is generated when it is physically accelerated. There are different vibrations for different sounds. The track of vibration is noted for every 20 milliseconds. If there are different vibrations noted then the location is tracked and messages are sent to the nearby police station.

#### **TILT SENSOR**

Tilt sensor allows you to find orientation or inclination. These are low budget and easily used. They will not be damaged if used properly. The simplicity of tilt sensor makes popular for toys, gadgets and appliances. These are also called as "mercury switches", "tilt switches" or "rolling ball sensors" for their perspective reasons. If there is any inclination or orientation, the records will be recorded for every 20 milliseconds and if there is any bad issue, action will be taken.

#### **GPS/GMS**

GPS is used to locate the longitude , latitude of the victim. The GPS tracks the location of the victim if any of the sensors shows bad output. The latitude and longitude of the location is tracked and the location is sent. In this we use c programming to send the messages by using SMTP protocol.

#### **ARDUINO C**

Arduino c software which is used to take the details of micro controllers or sensors. C programming language is used to adjust the range of sensors.

#### **IMPLEMENTATION**

Arduino - Uno board is used as a micro controller. These sensors are connected to the Arduino - Uno board. Heart beat sensor is connected to the S1 pin and the s1 pin is input. S2 pin of Arduino - Uno board is connected as output to heartbeat sensor. Hand is placed on the heartbeat sensor, Arduino board is connected to the computer by using a cable, by using Arduino c software the readings are noted and for every 20 milliseconds delay the readings are noted.

Tilt sensor is also connected in same way as heartbeat sensor is connected. Tilt sensor gives bending or inclination in all directions.

Vibration sensor is also connected in the same way as the above sensors. Vibration coming from all directions are noted in this sensor.

Raspberry pi3 is a microprocessor, it is connected with Arduino. GPS is fixed in the raspberry pi. If there is any emergency message will be sent to the nearby police station.

#### **COMPARISION**

In Existing System, many applications such as mobile applications like "HELP ME ON MOBILE" is developed. \*91# codes are also developed. If there is any emergency to that code women either call or send message

In Proposed Work, multiple sensors like the heartbeat sensor, flex sensor, tilt sensor, vibration sensor is used to detect the condition of women if there is any emergency the message and the location is automatically sent to nearby police station and relatives.

The Existing system needs a single click to get help. At sometimes women in the situation where a single click also cannot be done. May women be in a block out stage. At that time, body sensors help her to detect automatically.

### CONCLUSION

A safety device for women, which can be carried using GPS and three different sensors has been created. This may help women when there is any emergency.

The GPS sends message automatically to the nearby police station and relatives by tracking their location. This may help women to move freely wherever she wants.

### REFERENCES

1. Orlando Pereira, Joao M. L. P. Caldeira, Joel J.P.C Rodrigues "Body Sensor Network Mobile Solutions for Biofeedback Monitoring", Springer Science +Business Media, LLC ,2010.
2. Mirjami Jutila, Helen Rivas, Pekka Karhula, Susanna Panssar "Implementation of a Wearable Sensor Vest for the Safety and Well-being of Children", The second international Workshop on Body Area Sensor Networks(BASNet-2014), Elsevier B.V, 2014.
3. Samuel Tanga, Vineetha Kalavally, Ng Kok Yew, Jussi Parkkinen "Development Of A Prototype Smart Home Intelligent Lighting Control Architecture Using Sensors Onboard A Mobile Computing System", <http://dx.doi.org/10.106/j.enbuild.2016.12.069>, 2016, Enb 7248.
4. Jesudoss A. and Subramaniam N.P., "EPBAS: Securing Cloud-Based Healthcare Information Systems using Enhanced Password-Based Authentication Scheme", Asian Journal of Information Technology, Vol. 15, Issue 14, 2016, pp. 2457-2463.
5. Jesudoss A. and Subramaniam N.P., "Enhanced Kerberos Authentication for Distributed Environment", Journal of Theoretical and Applied Information Technology, 2014 Vol. 69, No. 2, pp. 368-374. (Scopus Indexed)
6. Lakshmanan, L. and D. Suganthi Sharmila, A,(2017), "Security Improvement for Web Based Banking Authentication by Utilizing Fingerprint", Global Journal of Pure and Applied Mathematics RIP India, Vol. 13, No.9,pp. 4397-4404,India, 2017, ISSN: 0073--1768
7. Lakshmanan, L. and Sankar,(2015), "Dynamic cognitive system for recovering from vulnerable attacks in social network", International journal of Applied Engineering Research, RIP India, Vol. 10, No.4,pp.10365-10374,India, 2015, ISSN: 1087--1090.
8. Parth Sethi, Lakshey Juneja, Punit Gupta and Kaushlendra Kumar Pandey "Safe Sole Distress Alarm System for Female Security Using IOT", Springer Nature Singapore Pte Ltd. 2018.
9. Pooshkar Rajiv, Rohit Raj, Mahesh Chandra "The Email Based Remote Access and Surveillance System for Smart Home Infrastructure", Perspectives in Science, <http://dx.doi.org/doi:10.1016/j.pisc.2016.04.104>, 2016.
10. Enji Sun, Xing Zhang, Zhongxue Li "The Internet Of Things(IOT) and cloud computing(CC) based tailings dam monitoring and pre-alarm system in mines", The First International Symposium on Mine Safety Science and Engineering, Elsevier, 2011.
11. Zheng Yan, Peng Zhang, Athanasios V. Vasilakos "A Survey on Trust and Management for Internet Of Things(IOT)", Journal of Network and Computer Applications, Elsevier, 2013.
12. Alessio Botta, Walter De Donato, Valerio Persico, Antonio Pescapè "Integration of Cloud Computing and Internet Of Things(IOT): A Survey", Future Generation Computer Systems, 2015.
13. Luigi Atzori, Antonio Lera, Giacomo Morabito, Michele Nitti, "The Social Internet Of Things(SIOT)", Computer Networks, Elsevier, 2012.
14. S.Sicari, A.Rizzardi, L.A. Grieco, A. Coen-Porisini "Security, Privacy and Trust in Internet Of Things(IOT)", Computer Networks, Elsevier, 2014.
15. Andre Gloria, Fencisco Cercas, Nuno Souto, "Design and Implementation of an Internet Of Things(IOT) Gateway to Create Smart Environments", The 8th International

- Conference on Ambient Systems, Networks and Technologies, Elsevier, 2017.
16. Carolyn Witzman, Margaret Shaw, Caroline Andrew and Kathryn Travers, "The Effectiveness of Women Safety Audits", *Security Journal* 22, 205-218 doi:10.1057/sj.2009.1.; 2009.
  17. Min Chen, Yujun Ma, Jeumgeum /song, Chin, Feng Lai, Bin Hu "Smart Clothing : Connecting Human with Cloud and Big Data for Sustainable Health Monitoring" Springer Science + Business Media New York, 2016.
  18. Mandeep Singh, Neelu Jain, "Design and Validation of Android Based Wireless Integrated Device for Ubiquitous Health Monitoring" Springer Science + Business Media New York, 2015.
  19. Susana E. P. Costa<sup>1</sup> & Joel J. P. C. Rodrigues & Bruno M. C. Silva<sup>1</sup> & João N. Isento<sup>1</sup> & Juan M. Corchado, "Integration of Wearable Solutions in AAL Environments with Mobility Support", Springer Science + Business Media New York, 2015.
  20. John Ayoade, "Roadmap to Solving Security and Privacy Concerns in RFID Systems", *Privacy and RFID Systems*, 2007, Elsevier.
  21. Rolf H. Weber, "Internet Of Things-New Security and Privacy Challenges", Elsevier, 2010.



