Design and Development of IoT Enabled Smart Sandal

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Abstract: *In this paper, an attempt has been made to develop a smart device that can assist women when they feel unsafe. This smart device will be clipped to the footwear of the user and can be triggered discreetly. On tapping one foot behind the other four times, an alert is sent via Bluetooth Low Energy communication to an application on the victim's phone, programmed to generate a message seeking help with the location of the device attached. The results obtained were analysed using Naïve Baye classifier. In such situations, the aid of a safety device that will inform the victim's family members or the authorities (in severe situations) may help women feel safer, confident and reduce the chances of harassment.*

Keywords: Internet of Things, Bluetooth Low Energy, Acceleration Sensor Wearable Device, Woman Safety

I. INTRODUCTION

This Project presents a women safety detection system using GPS and GSM modems. The system can be interconnected with the alarm system and alert the neighbors. This detection and messaging system is composed of a GPS receiver, Microcontroller and a GSM Modem. GPS

Receiver gets the location information from satellites in the form of latitude and longitude. Women are the backbone of any economy primarily shaping future of the country. She who earlier stayed at home to attend her domestic duties is now maintaining work and home simultaneously, participating in the process of economic development on an equal footing with men. The Government of India, meeting a longstanding demand for gender parity in the workforce, has approved an amendment in The Factories Act 1948 to allow women employees to work in nightshifts. The amendment suggests that nightshift for women shall be allowed only if the employer ensures safety, adequate safeguards in the factory as regards occupational safety and health, equal opportunity for women workers, adequate protection of their dignity, honour and transportation from the factory premises to the nearest point of their residence are met.

1.1 Goals or Objective
- Women safety in public places.
- Area of focus
  - Public parks
  - Public Markets
- Women safety at different time of the day.
- To find out their perspective on this issue.

II. LITERATURE SURVEY

Shaik Mahammad Rasool: This project is designed with ATmega328. This Project presents a women safety detection system using GPS and GSM modems. The system can be interconnected with the alarm system and alert the neighbors. This detection and messaging system is composed of a GPS receiver, Microcontroller and a GSM Modem. GPS Receiver gets the location information from satellites in the form of latitude and longitude. The Microcontroller processes this information and this processed infomation is sent to the user using GSM modem A GSM modem is interfaced to the MCU. The GSM modem sends an SMS to the predefined mobile number.
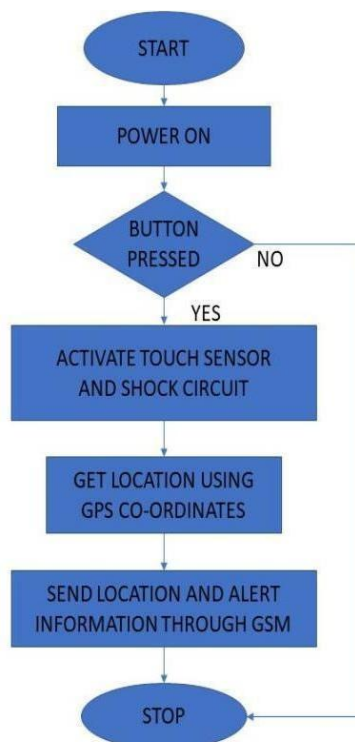
Syeda Bisma Fatima: In the general sense, security is a concept similar to safety. The nuance between the two is an added emphasis on being protected from dangers that originate from outside. Individuals or actions that encroach upon the condition of protection are responsible for the breach of security. The word "security" in general usage is synonymous with "safety," but as a technical term "security" means that something not only is secure but that it has been secured.

Safwan Ahmed Farooqi: The Global Positioning System is location tracker. It , tracks the current location in the form of longitude and latitude. The GPS Coder Module will use this information to search an exact address of that location as the street name, nearby junction etc. which is directly connected to USART of the micro controller provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth. In case if GPS is disabled then the system will only send the longitude and latitude through SMS. So, Internet is mandatory.

Syed Sirajul Hassan: It is essentially, a program that allows user to observe an operation through simulation without actually performing that operation. If we think professionally that using software simulations, one can show their customer how everything works in his program. Also, he can make it interactive, clients will be able to take a closer look at the features that interest them most. In our project we have mainly used Proteus version as Simulation Software. Other associated required software along with it are stated below.

Syed Saber: The Microcontroller processes this information and this processed information is sent to the user using GSM modem A GSM modem is interfaced to the MCU. The GSM modem sends an SMS to the predefined mobile number. When a woman is in danger andin need of self- defense then she can press the switch which is allotted to her. By pressing the switch, the entire system will be activated then immediately a sms will be sent to concern person with location using GSM and GPS.

III. PROPOSED WORK

3.1 The Flow if the System

On web dashboard , and receive sms alert. So, this is flow chart of your project so first we start the flow then power is on if yes the button is pressed then the activate touch sensor and shock circuit then it is done we get location using GPS Coordinates then sensor send location and alert information through GSM. then all done it will stop .if no then it no work.

3.2 Functional Modules

1. **Sensor Interfacing Module:** Broadly, in the internet of things, a sensor interface is a bridge between a device and any attached sensor. The interface takes data collected by the sensor and outputs it to the attached device, for example, a water level sensor passing data to a radio transmitter. Different interface options vary in complexity.
2. **Web Dashboard Module:** An IoT dashboard is the user interface within an IoT platform that enables users to monitor and interact with connected devices though graphs, charts and other tools and UI elements.
3. **Cloud Connectivity Module:** Cloud computing enables the storage and analysis of data to be done quickly and in real-time, allowing enterprises to get the maximum benefit.

IV. CONCLUSION

This project mainly focuses on the low cost implementation of the device which can save the life of the women in the critical condition the proposed system provides end to end security solutions for women safety using the advance technologies of IoT along with combined hardware technology like GPS , Shock circuit , GSM module, ESP8266. The proposed system not only defends the women in the critical situation of rape, molestation. The overall system is first of its kind that provides a complete kit solution to the existing women safety problem, with the complete system the women can now travel freely without any hesitations of getting harmed by the societal issues.

REFERENCES

[1]. Shreyas R.S, Varun B.C, Shiva Kumar H. K, Punith Kumar B.E, Kalpavi, C. Y. (2016), " Design And Development of Woman Self Defence Smart Watch Prototype", International Journal of Advanced Research in Electronics and Communication Engineering, Vol. 5, Issue. 4, pp. 1179 – 1185.

[2]. Wearable Technology: The bra designed to shock attackers BBC News, retrieved date: September, 2020, [Online], Available: https://www.bbc.com/ news/ business-221 10443,

[3]. Basavaraj Chogula, Archana Naik, Monika Monu, Priya Patil, Priyanka Das. (2014),"Smart Girls Security System", International Journal of Application on Innovation in Engineering and Management, Vol. 3, Issue. 4, pp. 281-284.

[4]. Vishesh Sharma, Yati Tomar, D. Vydeki, (2019) "Smart Shoe For Women Safety", In Proceedings of 2019 IEEE 10th International Conference on Awareness Science and Technology (iCAST), DOI No: 10.1109/ ICAwST.2019.8923204

[5]. G C Harikaran, Karthik Menasinkai, Suhas Shirol, (2016) "Smart Security for Women Based on Internet of Things(IoTs)", IEEE International Conference on Electrical, Electronics and Optimization Techniques (ICEEOT), DOI No: 10.1109/ICEEOT.2016.7755365

[6]. Remya George, Anjaly Cherian. V, Annet Antony, Harsha Sebestian, Mishal Antony, Rosemary Babu. T, (2014) "An Intelligent Security System for Violence against Women in Public Places", International Journal of Engineering and Advanced Technology, Vol. 3, Issue. 4, pp. 64-68.

[7]. Nishant Bharadwaj, Nitish Aggarwal, (2014) "Design and Development of Suraksha – A Women Safety Device", International Journal of Information and Computation Technology, Vol. 4, No. 8, pp. 787-792.

[8]. Nandita Viswanath, Naga Vaishnavi Pakyala, G. Munneswari, (2016) "Smart Foot Device for Women Safety", IEEE Region 10 Symposium (TENSYMP), DOI No:10.1109/TENCONSpring.2016.751939 1.

[9]. Alexandros Pantelopoulos, Nikolas G. Bourbakis, (2010) "A Survey on Wearable Sensor-Based Systems for Health Monitoring and Prognosis", IEEE Transactions on Systems, Man and Cybernetics – Part C: Applications and Reviews, Vol. 40, No. 1, DOI No: 10.1109/TSMCC.2009. 2032660.

[10]. Arduino Nano 3.0 Data Sheet , retrieved date: September, 2020 [Online], Available: https://www.arduino.cc/.

[11]. SIM800L GSM Module Data Sheet, retrieved date: August, 2020 [Online], Available: https://simcom.ee/.

[12]. NEO- 6M GPS Module Data Sheet, retrieved date: September, 2020 [Online]. Available: https://www.u-blox.com.

[13]. FS100A RF Tx and Rx Module Data Sheet, retrieved date: September, 2020 [Online], Available: http://www.mantech.co.za.

[14]. Google Maps [Online], Available: https://www.goo gle.com/maps, Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA.