Mathematical Statistician and Engineering Applications
ISSN: 2094-0343
2326-9865

System for Women's Security using IoT

T. Sunitha[1], B. Rama Devi[2], A. Swathi[3], D. Ashok[4], Dr. B. Mouli Chandra[5]

[1, 2, 3, 4] Department of Computer Science and Engineering,

[5]Electronics and Communications Engineering

[1, 2, 3, 4, 5] QIS College of Engineering and Technology, Ongole, Andhra Pradesh, India

Thella.sunitha@qiscet.edu.in [1], b.ramadevi@qiscetedu.in [2], a.swathi@qiscet.edu.in [3], ashok.d@qiscet.edu.in[4], moulichandra.b@qiscet.edu.in[5]

Corresponding Author Mail: qispublications@qiscet.edu.in

Article Info
Page Number: 93-103
Publication Issue:
Vol 69 No. 1 (2020)

Article Received: 15 September 2020
Revised: 24 October 2020
Accepted: 26 November
Publication: 30 December 2020

Abstract: All young women, women of all walks of life, and individuals struggle daily to protect themselves from the wandering eyes of highly ill-mannered men who abuse young women's attitudes. The Blade IoT implementation includes Raspberry Pi, temperature and heart-rate sensors, Global PS, panic pin, and camera all included. This tiny device uses a Raspberry Pi camera to take pictures of the attacker and instantly transfer the bleeding victim's rim area when the victim's pulse. It can be activated by the victim by hitting a button. A legal authority or predetermined contact information can get the position and connection of the taken image and SMS. We also use voice factor, a technique a woman uses to when she pushes the button to ask for help when she is not in a crisis, a message is sent to the

Keywords - Raspberry Pi, heart rate monitor, camera, Global Positioning System, panic pin, female security device

I INTRODUCTION

Women are now able to keep up with men in all areas, but tragically at the expense of bullying, anger and cruelty in communities and homes. They are unable to consent their houses during the day, dress however they choose, or commute to work together. There is a stigma against women that undermines their sense of opportunity while also undermining their faith and aspirations. The aforementioned reasons make it very evident that women's safety is a pressing concern throughout the nation [1]. In order to prevent women from ever feeling helpless while navigating such difficult social environments, this research focuses on a protective system that leverages a raspberry pi [4]. Modern technologies could be developed to safeguard the women in perilous situations. In this paper, we combine a temperature sensor, heart-rate sensor, Global Positioning System, and camera component with a low-cost, portable Raspberry Pi [3]. The suggested effort makes use of the following three methods of contacting the relevant authorities:

First, if a female is in danger, she can click a pin to send a message with the victim's position and picture to the appropriate number. Second, a modified version of the current gadget is used to determine the threshold after learning each person's unique pattern of body temperature and heart rate. When both of these are above the threshold number, it

automatically notify the appropriate authorities [2]. One of the main benefits of this study is that in the third scenario, when a woman is in danger and unable to touch a button, voice data is used (for instance, the woman uses the word "HELP" to direct a message to the appropriate number with the victim's spot and picture).

We developed a tiny device for women's security and safety that can be activated by the user pressing a button and that uses voice, temperature and heart-rate data embeded into the Raspberry Pi using the Python. When the user feels endangered, the computer will be informed of her present location, the victim's picture, and an SMS alert. Using speech data that is built into the Raspberry Pi, women can say "help me" etc. then information will be sent.

The residual sections of the paper : The literature search is summarized in Section II. Section IV deals with proposed modules for the protection of women, and Section III considers the theoretical basis of system modules. The implementation is described in Section V along with the software used and how it works. An analysis of the outcomes of the proposed system is given in Section VI. The conclusion of the study appears in section VII.

II LITERATURE SURVEY

The idea of "Women Empowerment towards Developing India" proposed by **A. Priyadarshini et al.** Ladies' empowerment focuses on giving all females in the country the freedom to govern themselves in every way possible, to be conscious on their rights, and to provide for true security. In this essay, the main concerns are presented, along with plans for ladies' empowerment in India and a self -help cluster that is now functioning in the Tamil Nadu province. Additionally, there are references for self-help clusters to improve and a history of the Female Empowerment Cell..

Muskan et al. [2] "Women Safety Device Designed using IoT and Machine Learning" was put into use. The purpose of this study is to create a device. When both temperature and heart-rate surpass thresholds, the device sounds an alarm and is programmed to learn each person's unique temperature and heart rate patterns. When this happens, it automatically sends the message with the location to the given emergency number so that action can be taken.

Naeemul Islam et al. [3] "Design and Implementation of Women Auspice System by Using GPS and GSM" was the intended aim. Three push buttons, a Global Position System module and PIC16F887 microcontroller were utilised in this system. GPS is used to quickly spread the client's place**.**

Three push latches are utilised to show the various scenarios in which an accident victim can find themselves. Anytime the client encounters a difficulty, they can press any one of these three buttons. Following its receipt, the microcontroller will send message to the specified number. After the customer is secured, the customer's location is constantly tracked until the security system is turned off. They also used a PIC16F887A microcontroller to run the entire system, which was powered by four AA batteries.

SMARISA: An IoT-based Smart Ring for Ladies' Safety is the brainchild of **Navya R Sogi [4].** In order to deploy the services, they created a wearable device for women called SMARISA that contains a Raspberry Pi, camera, bell, and catch. The device is incredibly useful and it can be triggered simply moving the catch. This will transfer her current position as well as use the Raspberry Pi camera to capture a picture of the aggressor and email the crisis contact number.

Women's and children's security was created by **Prof. Sunil K. Punjabi [5]** utilising an intelligent smart system. a practical tool with a weight switch. When an attacker attacks the woman or young person or when they identify any weakness in a more unusual person, they would then have the option to quickly seize the gadget by pressing or smashing it. A standard SMS with the connected zone will sent to the people/gatekeeper number entered in the devices at the time of purchase as soon as the weight sensor detects this weight. Then called back. If the phone is not answered for a long time, the police will communicate and message will sent as well.

G C Harikiran et al. [6] Applied "Internet of Things-based Smart Security Solution for Women" They proposed a device that combines a few different devices; the device combines a wearable "bright band" that constantly says with a smart phone that has access to the internet. The product has been altered and load with all the essential information that links human performance and responses to unusual circumstances like outrage, dread, and stress. The phone will then receive the signal**.** The device can access scheduled GPS and notification services, so when it takes an emergency signal, it can send a demand for help and location coordinates to the adjacent police headquarters, family members, and anyone in the area.

Nandita Viswanath et al. [7] invented a smart shoe for females' protection the user's footwear will be equipped with a smart device that can be attentively triggered. The remaining four taps on the back leg will send an alarm to the offender's mobile phone application via a Bluetooth Little Energy connection. Modified to send an SMS asking for assistance in the vicinity of the linked device.

III. THEORETICAL EXPERIENCE

Raspberry Pi

This Raspberry Pi is a compact, low-cost system that fits on a single circuit board. It is meant to use fewer power than a typical system. This Raspberry Pi consists of following components:
PC USB power supply, HDMI port, audio /video jack, display port, micro SD slot, and GPIO pins. This Raspberry Pi is powered by the PC USB port. With help of SD card, it is possible to save mass storage. The smart phone used for computerisation can have its SD card inserted.

Fig . 1. Raspberry Pi Model B

This sophisticated DHT11 temperature and viscosity sensor is a complex sensor including customized. computerised temperature and stickiness signal yield.

Fig. 2. DHT11 Temperature Sensor

It uses especially sophisticated series of module technology and temperature and humidity detection technology to ensure high product reliability and excellent long-term stability. Only 3 pins are available. GND, VCC and data.

Pulse Rate Sensor

This Pulse rate sensor's yield is equally sophisticated. With the help of the microcontroller and that sophisticated yield, the beats per minute (BPM) rate may be calculated. When the heartbeat detection is functioning, the car streaks for each heartbeat.

Fig 3. Pulse Rate Sensor

Pi Camera

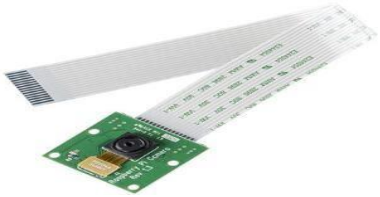

Fig. 4. Pi Camera

- Capture still images and high-definition video using the Raspberry Pi camera module.
- The module has a fixed focus 5 megapixel camera that can record still images as well as videos in 1080p30, 720p60, and VGA90 resolutions.
- A 15 centimeter ribbon cable is used to connect it to the Raspberry Pi's CSI port.

IV. PROPOSED SYSTEM

This research presentation's main objective is to use the Raspberry Pi to increase females' safety python is used. The temperature, heart-rate, Global Positioning System and camera modules on the Raspberry Pi are built-in. A lady can send an SMS to warn responsible authorities if she is in danger. Both manually and automatically can send out this warning. Giving vulnerable women language assistance also benefits them. When she cried "help," a text message alert was sent to the police or guardian, including her, even though she didn't touch a button at the time.

Architecture

This future system design consists of a power supply, temperature and heart rate sensor, Raspberry Pi module, Global Positioning System sensor, camera, audio data, and two input pins.

The engineering design of the women's safety device is shown in Figure. 5. It includes a raspberry pi model B, a simple computer for connecting a Raspberry Pi camera, two buttons for sending messages to the police and family depending on the women's state, a camera module that can capture criminals in the act, and also uses GPS to send the women's current location.

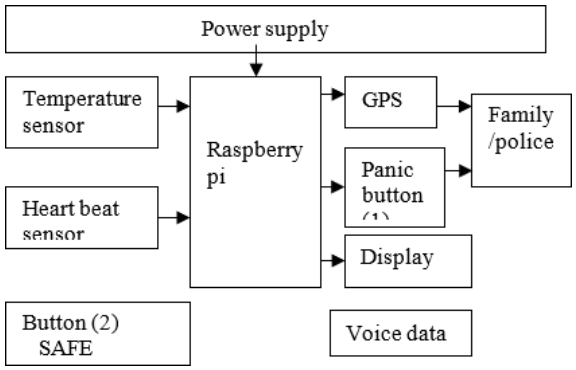

Fig. 5. System Block Diagram for Women's Safety

Here, we're utilising the Raspberry Pi's built-in temperature and heart rate sensors. When a healthy person's body temperature is 37°C and their heart beats normally between 60 and 100 times per minute. Body temperature and pulse rate increase when a woman is in danger, and if either value exceeds a predetermined level, an automatic alarm is sent to her family, the police, or friends. When something unexpected happens and it exceeds the threshold in certain conditions, we sometimes utilise a separate button to send the message. “I’m secure. We employ a third button, which is touched by a lady who is in danger, when the

aforementioned situation does not apply. The necessary authorities will then receive the position, photo, and SMS. When a woman is in danger and can't press the button, she can still say "Help," and the right authorities will receive the alert. One notable benefit of our paper is this. You should periodically expect this because ladies cannot press buttons. If the first two requirements are not satisfied.

V. IMPLEMENTATON

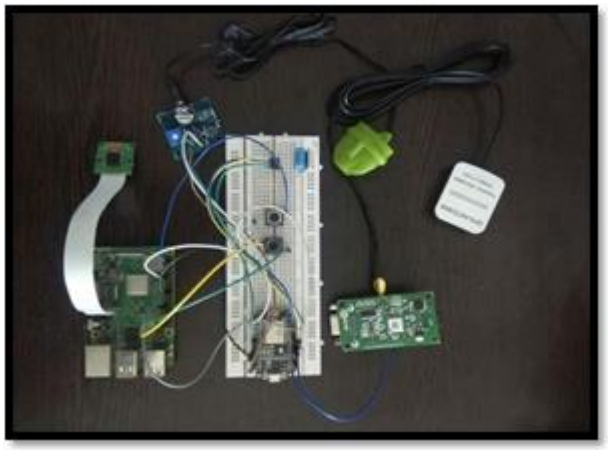

Fig. 6. System for women's safety and security prototype

The female security system prototype model consists of a raspberry pi, a temperature and heart rate sensor, a pi camera, Global Positioning System, alarm button, and a node MCU controller used to connect heart rate and Global Positioning System. The smart Raspberry Pi is powered by a micro USB charger, access to 12 volt power. Wherever the heart rate and temperature sensors are located continually. Three alternative scenarios are used in our study to help at-risk women.

Here, we're utilising the Raspberry Pi's built-in temperature and heart rate sensors. When a healthy person's body temperature is 37°C and their heart beats normally between 60 and 100 times per minute. Body temperature and pulse rate increase when a woman is in danger, and if either value exceeds a predetermined level, an automatic alarm is sent to her family, the police, or friends.

We use a different button to deliver the message "I'm safe" in some scenarios if we see something unexpected happening and it exceeds the threshold. When a lady is in risk, she press the pin. If the aforementioned test is occasionally unsuccessful, an SMS, a photograph, and her location are transmitted to the relevant authorities. This is why we are using two buttons. If a woman is in danger and unable to click a button, she can just say, "Just help," and the right authorities will receive the alert. The major advantage for women is that we will use speech data if the first two conditions are not met.

VI. RESULTS

As depicted in the figures, the appropriate authorities receive an SMS notification with current location and captured image. In our project, we use three different methods to assist

women: first, automatically when their body temperature and pulse rate surpass certain thresholds; second, by pressing a button; and third, by speaking to them. It notifies concerned authorities of any situation.

Fig. 7. The position of the victim

Above fig. reveals the victim's present position. We can determine a victim's present location using the raspberry pi's GPS integration, python programming language, audio data, and both automatic and manual methods.

Fig. 8. Capture copy of victim

Above fig. displays the victim's image that was taken using the raspberry pi's attached pi camera.

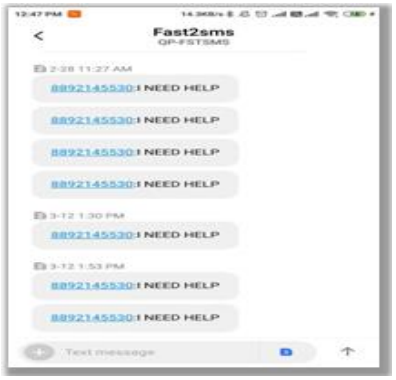

Fig. 9. Message alert

Above fig. demonstrates sending the SMS alert to a list of contacts.

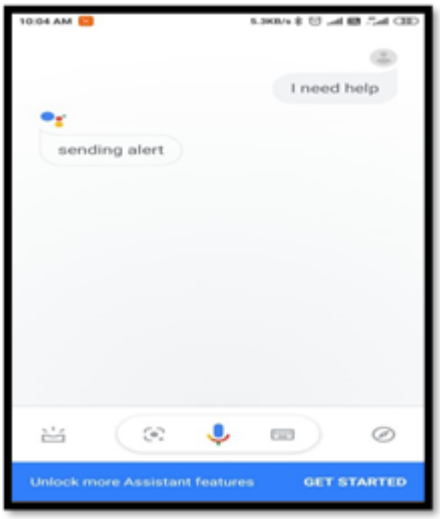

Fig. 10. SMS alert though voice

Above fig. shows Google voice evidence is used to link Raspberry Pi and retrieve the target's position, a photograph, and an SMS alert.

Fig. 11. After pressing button2 message will send that I'm safe

Above fig. demonstrates the advantage of button (2) when women are not in risk and something strange is detected. It also sends an alert automatically to prevent this and we utilise SMS to say "I'm safe."

VII. CONCLUSION

The protections in place right now are insufficient to stop women from being banned. The system's main objectives are price and quickness. When they are in danger, women will be able to utilise this paper to identify themselves to the appropriate authorities. The technology is being used for voice data usage, SMS alerting, image capture, and GPS tracking. The warning is sent both physically and mechanically. The increase in security products and software is fueled by threats against women. This analysis shows the numerous modules that have been used in innovative submissions and tools created for the happiness of women. This essay has examined the many measures taken to defend women against dishonest persons. A quick explanation of the equipment and parts is also provided criminalized. The system's main objectives are price and quickness. The W used in these techniques is offered.

This model can also be improved to create a wearable device. To make the design more portable and user-friendly, it can be made lighter and more compact.

REFERENCES

1. A. Priyadarshini, R.Thiyagarajan, V.Kumar, T.Radhu, "Women Empowerment towards developing India",IEEE Conference in Humanitarian Technology Conference,21-23 Dec 2016,Agra,India, pp.1-6.
2. Muskan , Teena Khandelwal, Manisha Khandelwal, Purnendu Shekhar Pandey, "Women Safety Device Designed using IoT and Machine Learning",2018 IEEE, pp. 1204-1210.
3. Naeemul Islam,Md Anisuzzaman, Sikder Sunbeam Islam, Mohammed Rabiul Hossain, Abu Jafar Mohammad Obaidullah, "Design and Implementation of Women Auspice System by Utilizing GPS and GSM", International Conference on Electrical, Computer and Communication Engineering (ECCE), 2019, pp. 1-5.
4. Navya R Sogi, Priya Chatterjee, Nethra U, Suma V, "SMARISA: A Raspberry Pi based Smart Ring for Women Safety using IoT", Proceedings of the International Conference on Inventive Research in Computing Applications (ICIRCA 2018), pp. 451- 454.
5. Prof. Sunil K Punjabi, Prof. Suvarna Chaure, Prof. Ujwala Ravale, Prof. Deepti Reddy, "Smart Intelligent System for Women and Child Security", 2018 IEEE, pp. 451-454.
6. G C Harikiran, Karthik Menasinkai, Suhas Shirol, "Smart Security Solution for Women based on Internet Of Things(IOT)", 2016 IEEE, pp. 3551-3554.
7. Nandita Viswanath, Naga Vaishnavi Pakyala , Dr. G. Muneeswari, "Smart Foot Device for Women Safety", 2016 IEEE Region 10 Symposium (TENSYMP), Bali, Indonesia, pp. 130-133
8. Dantu Sai Prashanth, Goutam Patel, Dr. B. Bharathi, "Research and development of a mobile based women safety application with real-time database and data-stream network", 2017 International Conference on Circuits and Computing Technologies[ICCPCT], pp. 1-5.
9. Sindhu.K, Dr. R. Subhashini, Dr.S. Gowri, J.S Vimali, "A Women Safety Portable Hidden Camera detector and jammer, International Conference on Communication and Electronics Systems (ICCES 2018), pp. 1187-1189.
10. Ramachandiran R1, Dhanya .L2, Shalini.M3, "A Survey on Women Safety Device Using IoT", Proceeding of International Conference on Systems Computation Automation and Networking 2019, pp. 1-6.
11. Wasim Akram, Mohit Jain, C. Sweetlin Hemalata , "Design of a Smart Saftey Device for Women Using IoT", International Conference on Recent Trends in Advance Computing 2019, ICRTAC 2019, pp. 657-662.
12. Shaista Khanam, Trupti Shah, (2019) Self Defence Device with GSM Alert and GPS Tracking with Fingerprint Verification for Women Safety, International Conference on Electronics Communication and Aerospace Technology [ICECA], IEEE.
13. N. Islam, Md. Anisuzzaman, (2019) Sikder Sunbeam Islam, Mohammed Rabiul Hossain, Abu Jafar Mohammad Obaidullah, Design and Implementation of Women Auspice

System by Utilizing GPS and GSM, International Conference on Electrical, Computer and Communication Engineering (ECCE), IEEE.

14. Sharifa Rania Mahmud, Jannatul Maowa, Ferry Wahyu Wibowo, (2017) Women Empowerment: One Stop Solution for Women, 2nd International Conferences on Information Technology, Information Systems and Electrical Engineering (ICITISEE), IEEE.
15. Anand Jatti, Madhvi Kannan, Alisha RM, Vijayalakshmi P, Shrestha Sinha, (2016) Design and Development of an IOT Based Wearable Device for The Safety and Security of Women and Girl Children, International Conference on Recent Trends in Electronics Information Communication Technology, IEEE.
16. Sunil K Punjabi, Suvarna Chaur, Ujwala Ravale, Deepti Reddy, (2018) Smart Intelligent System for Women and Child Security, 9th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON), IEEE.
17. M. Kavitha, V. Sivachidam baranathan, (2018) Women Self-Protecting System Using Internet of Things, International Conference on Computational Intelligence and Computing Research (ICCIC), IEEE.
18. R. Pavithra, S. Karthikeyan, (2017) Survey on Women's Safety Mobile App Development, International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS), IEEE.
19. Madhura Mahajan, KTV Reddy, Manita Rajput, (2016) Design and Implementation of Rescue System for Safety of Women International Conference on Wireless Communications, Signal Processing and Networking (WiSPNET), IEEE.
20. Nandita Viswanath, Naga Vaishnavi Pakyala, G. Muneeswari, (2016) Smart Foot Device for Women Safety, IEEE Region Ten Symposium (TENSYMP), IEEE
21. .G C Harikiran, Karthik Menasinkai, Suhas Shirol, Smart Security Solution for women based on Internet Of Things(IOT), International Conference on Electrical, Electronics, and Optimization Technique IEEE-2016.
22. Abhijit Paradkar, Deepak Sharma, All in one Intelligent Safety System for women security, International Journal of computer applications, Volume 130-No.11, November 2015
23. Divya Chitkara, Nipun Sachdeva ; Yash Dev Vashisht, Design of a women safety device, 2017 IEEE.
24. Thaware, Safety device for womens security using GSM/GPS, International Journal on Recent and innovation trends in computing and communication, vol.5, issue.4,5-7, 2017
25. A.Priyadarshini, R.Thiyagarajan, V.Kumar, T.Radhu, "Women Empowerment towards developing India", IEEE Conference in Humanitarian Technology Conference,21-23 Dec 2016, Agra, India,pp.1-6.
26. G C Harikiran, Karthik Menasinkai, Suhas Shirol,Smart Security Solution for Women based on Internet Of Things(IOT), 2016 IEEE, pp.3551-3554.
27. P Ramprakash, M Sakthivadivel, N Krishnaraj, J Ramprasath. "Host-based Intrusion Detection System using Sequence of System Calls" International Journal of Engineering

and Management Research, Vandana Publications, Volume 4, Issue 2, 241-247, 2014

28. N Krishnaraj, S Smys."A multihoming ACO-MDV routing for maximum power efficiency in an IoT environment" Wireless Personal Communications 109 (1), 243-256, 2019.
29. N Krishnaraj, R Bhuvanesh Kumar, D Rajeshwar, T Sanjay Kumar, Implementation of energy aware modified distance vector routing protocol for energy efficiency in wireless sensor networks, 2020 International Conference on Inventive Computation Technologies (ICICT),201-204
30. Ibrahim, S. Jafar Ali, and M. Thangamani. "Enhanced singular value decomposition for prediction of drugs and diseases with hepatocellular carcinoma based on multi-source bat algorithm based random walk." Measurement 141 (2019): 176-183. https://doi.org/10.1016/j.measurement.2019.02.056
31. Ibrahim, Jafar Ali S., S. Rajasekar, Varsha, M. Karunakaran, K. Kasirajan, Kalyan NS Chakravarthy, V. Kumar, and K. J. Kaur. "Recent advances in performance and effect of Zr doping with ZnO thin film sensor in ammonia vapour sensing." GLOBAL NEST JOURNAL 23, no. 4 (2021): 526-531. https://doi.org/10.30955/gnj.004020 , https://journal.gnest.org/publication/gnest_04020
32. N.S. Kalyan Chakravarthy, B. Karthikeyan, K. Alhaf Malik, D.Bujji Babbu,. K. Nithya S.Jafar Ali Ibrahim , Survey of Cooperative Routing Algorithms in Wireless Sensor Networks, Journal of Annals of the Romanian Society for Cell Biology ,5316-5320, 2021
33. Rajmohan, G, Chinnappan, CV, John William, AD, Chandrakrishan Balakrishnan, S, Anand Muthu, B, Manogaran, G. Revamping land coverage analysis using aerial satellite image mapping. Trans Emerging Tel Tech. 2021; 32:e3927. https://doi.org/10.1002/ett.3927
34. Vignesh, C.C., Sivaparthipan, C.B., Daniel, J.A. et al. Adjacent Node based Energetic Association Factor Routing Protocol in Wireless Sensor Networks. Wireless Pers Commun 119, 3255–3270 (2021). https://doi.org/10.1007/s11277-021-08397-0.
35. C Chandru Vignesh, S Karthik, Predicting the position of adjacent nodes with QoS in mobile ad hoc networks, Journal of Multimedia Tools and Applications, Springer US,Vol 79, 8445-8457,2020