EMPOWERING WOMEN'S SAFETY WITH SMART IoT TECHNOLOGY: A ROBUST PROTECTION SYSTEM

Mr.A.J.REUBEN THOMAS RAJ,P.BHARGAVI,

J.ANIL KUMAR,M.DHARUN,T.CHANDRASEKHAR,K.BHANU PRAKASH

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY

ABSTRACT

Women's safety has been highlighted as one of the major concerns of any society where several women are dealing with various safety issues like harassment, rape, molestation, and domestic violence due to different social or cultural reasons. Internet of Things (IoT) is becoming a promising technology to support day-to-day concerns and provide support in handling various affairs. Many IoT-based devices have been introduced by the community to help women deal with their potential safety threats. This study presents a systematic literature review of research studies exhibiting the IoT devices for women's safety, the main features these devices offer as well as the wearable, sensors used, and the machine learning algorithms used.. The results revealed that different types of sensors are used to capture the state of women undergoing safety issues where the pulse-rate, and pressure sensors are most commonly used sensors in these devices. In addition, the devices used different technology to transmit the alerts including global positing system (GPS), global system for mobile communication (GSM), and Arduino. In addition, this work proposes an architectural model that presents prominent components necessary to develop IoT-based women's safety devices.Lastly, this study emphasizes the use of combinations of sensors to get multiple types of input data that could lead to determining the possibility of threat with better accuracies and precisions.

Keywords: Arduino, human-machine interaction system, IOT

INTRODUCTION

The women safety system is engineered to uphold user well-being through a fusion of health monitoring and an emergency switch. The system interfaces with a switch and monitors bodily indicators, detecting both regular patterns and emergencies. Upon detecting an anomaly or the activation of the emergency switch, the system triggers a message transmission with the user's GPS location.

Implemented with a microcontroller, such as Arduino, the system processes bodily data and switch input in real-time. A GSM module facilitates message sending. When distress is detected, signaled by changes in bodily indicators, the system notifies the user with their GPS coordinates.

In emergencies, pressing the dedicated switch sends an immediate alert, including precise GPS coordinates. This ensures swift responses in critical situations, bolstering personal safety. The system is designed to be discreet

and user-friendly, seamlessly integrating technology into daily life while providing a robust safety mechanism for women.

By integrating health monitoring, emergency switches, and GPS technology, this women safety system delivers a comprehensive solution, allowing users to communicate distress situations quickly and effectively to predefined contacts. Real-time health monitoring enhances safety, making this project a holistic approach to women's well-being, also monitoring heart rate, tilt, and sound, triggering a buzzer alert and message to the user.

LITERATURE SURVEY

[1] **Smart device for women's safety designed using IoT and virtual instrumentation browser.**
that integrates IoT sensors for real-time monitoring and a virtual instrumentation browser for data visualization and analysis.

[2] **Iot based emergency button for women safety.**
the device sends an alert to a centralized server via a wireless network. The server then processes the signal and determines the user's location using GPS or Wi-Fi triangulation.

[3] **Iot based women security system using raspberry pi.**
Analyze sensor data to detect any suspicious events, such as sudden movements or changes in location.

[4] **IoT based smart security and safety system for women and children.**
It integrating various sensors, actuators, and communication devices. The system continuously monitors the surroundings for any potential threats or dangers.

[5] **Enhanced wearable strap for feminine using IoT.**
The algorithm starts by designing the wearable strap with sensors for monitoring vital signs, GPS for location tracking, and accelerometers for activity tracking.

[6] **Alternative approach to women safety using IoT.**
The algorithm works by continuously monitoring sensor data for patterns indicative of potential threats, such as sudden changes in location or unusual heart rate fluctuations.

[7] **Android app for women security system.**
The Android app for women's security operates with a multifaceted algorithm. Firstly, it integrates GPS tracking to monitor the user's location in real-time.

PROPOSED SYSTEM

Designing a system to empower women's safety with smart IoT technology is crucial for addressing safety concerns. It should incorporate features like real-time tracking, emergency alerts, and automated response mechanisms to provide robust protection. Additionally, integrating user-friendly interfaces and ensuring privacy and data security are paramount for its effectiveness and acceptance.
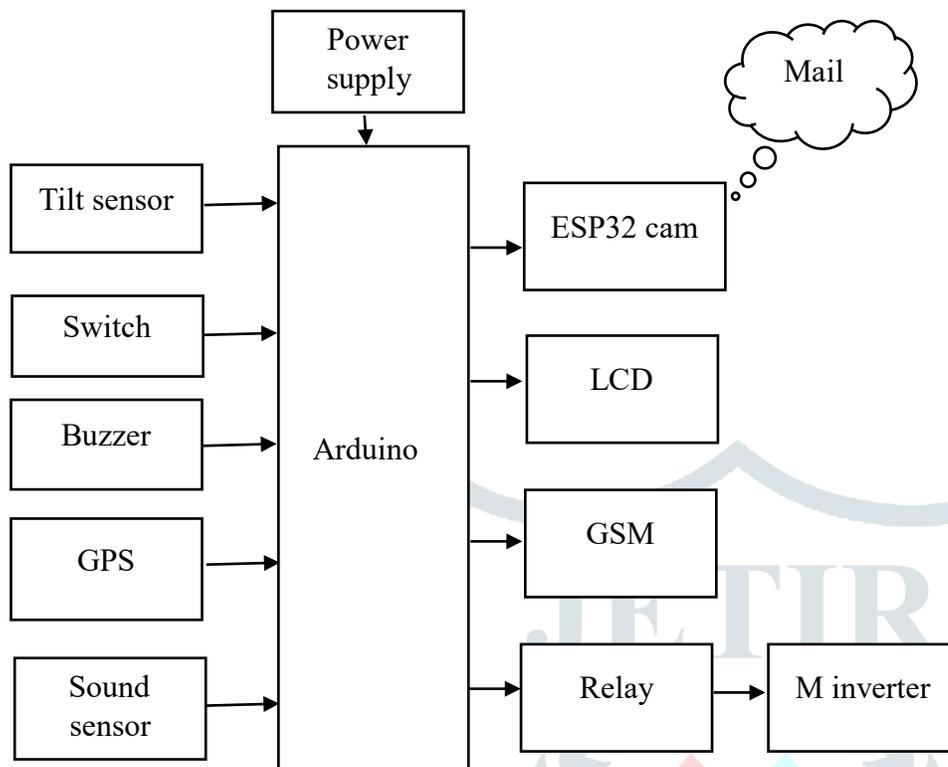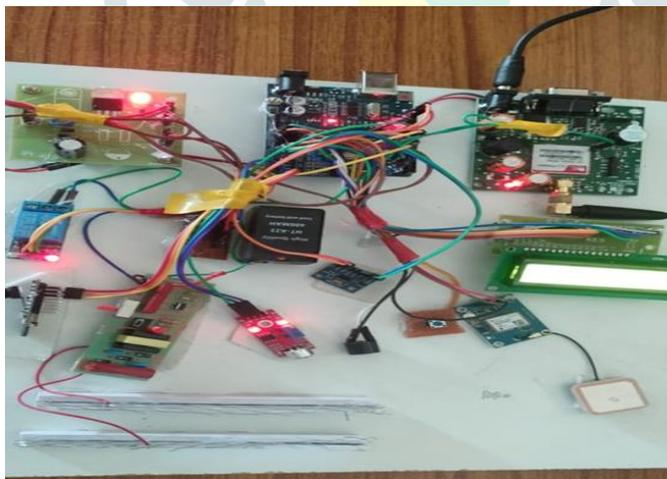
Fig: Block Diagram

EXPERIMENTAL RESULTS

Overall, the output of empowering women's safety with smart IoT technology involves a multi-faceted approach that combines technological innovation, community engagement, policy advocacy, and ongoing

evaluation to create safer environments for women.

Fig. Hardware equipment of women protection sysem

➢ **Immediate Alerts:** Implementing systems that trigger alerts to authorities or designated contacts when potential threats or emergencies are detected.

Fig.1.It displays the message   **Fig.2.Latitude and Longitude of an abused person**

➢ **Real-time Monitoring:** Utilizing smart IoT devices such as cameras, sensors, and wearable gadgets to monitor environments continuously.
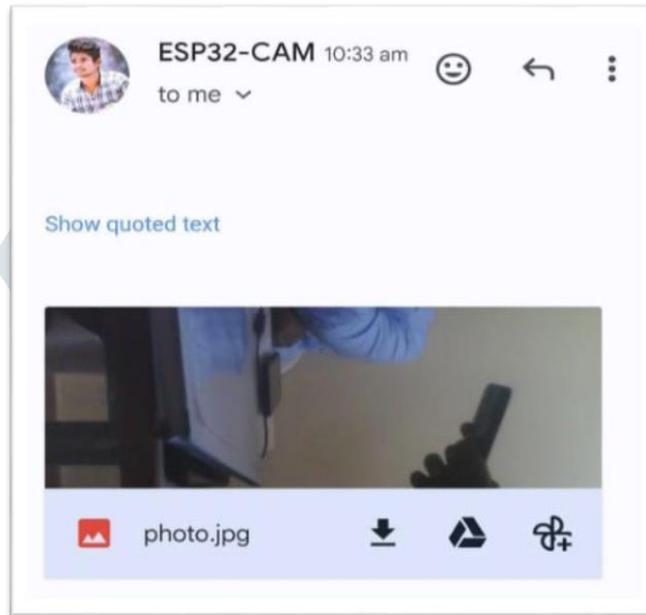

Fig.3. picture of the abused person

➢ **GPS Tracking:** Incorporating GPS technology into wearable devices to track the location of women in distress and facilitate swift responses from law enforcement or support services.
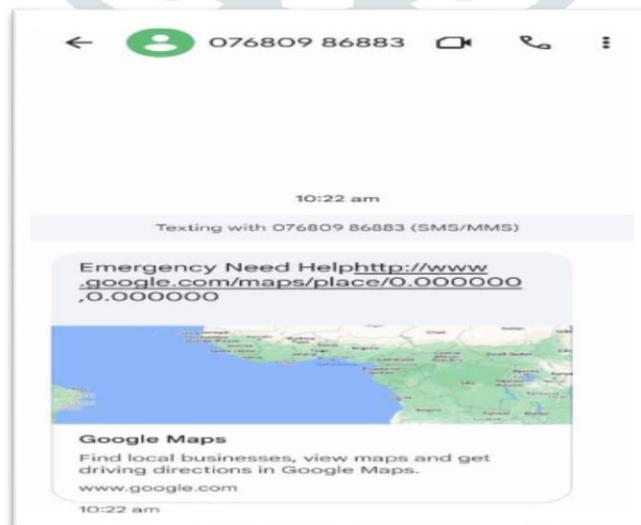

Fig.4.Live location of abused person

CONCLUSION

In conclusion, implementing smart IoT technology for empowering women's safety offers a robust protection system that leverages real-time data, automation, and connectivity to enhance security measures. By integrating features such as location tracking, emergency alerts, and smart surveillance, this solution provides a proactive approach to addressing safety concerns and responding effectively to potential threats. Furthermore, the scalability and adaptability of IoT systems allow for customization based on individual needs and evolving safety requirements. Overall, investing in smart IoT technology for women's safety not only fosters a safer environment but also contributes to the broader goal of creating inclusive and empowered communities.

REFERENCES

[1] BNK Reddy, BV Vani and GB Lahari, "An efficient design and implementation of Vedic multiplier in quantum-dot cellular automata," Telecommunication Systems, vol. 74, no. 4, pp. 487-496, 2020.

[2] B. Naresh Kumar Reddy, Dharavath Kishan and B. Veena Vani, "Performance constrained multi-application network on chip core mapping," International Journal of Speech Technology, vol. 22, no. 4, pp. 927-936, 2019.

[3] NKR Becchu et al., "System level fault-tolerance core mapping and FPGA-based verification of NoC," Microelectronics Journal, vol. 70, pp. 16-26, 2017.

[4] NKR Beechu et al., "High-performance and energy-efficient faulttolerance core mapping in NoC," Sustainable Computing: Informatics and Systems, vol. 16, pp. 1-10, 2017.

[5] B. Naresh Kumar Reddy, M.H. Vasantha and Y.B. Nithin Kumar, "A Gracefully Degrading and Energy-Efficient Fault Tolerant NoC Using Spare core," 2016 IEEE Computer Society Annual Symposium on VLSI, pp. 146-151, 2016.

[6] VS Boddu, BNK Reddy and MK Kumar, "Low-power and area efficient N-bit parallel processors on a chip," 2016 IEEE annual India conference (INDICON), pp. 1-4, 2016.

[7] R. T. Hameed, O. A. Mohamad and N. Ţapuş, "Health monitoring system based on wearable sensors and cloud platform," 20th International Conference on System Theory, Control and Computing (ICSTCC), pp. 543-548, 2016.

[8] R.Harini;P.Hemashree:" Android app for women security system" International Journal of Computer Science and Mobile Computing,2019.

[9] Sanicet Chikhale, Aniket Yadav, Faraz Shaikh, Prajakta Dounde, Ishwari Radar:" Iot based emergency button for women safety" International Journal for Research in Applied Science ,2022.

[10] D.G. Monisha, M. Monisha, G. Pavithra and R. Subhashini, "Women Safety Device and Application-FEMME," Indian Journal of Science and Technology, Vol. 9, Issue 10, 2016.