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WOMEN'S SECURITY SYSTEM USING ARDUINO

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Abstract **- This paper presents a system for live location tracking of women in emergencies, even when their mobile devices are turned off or not available. The system uses a SIM800 L GSM module to receive a command via SMS from the sender to locate the woman. The module communicates with an Arduino UNO, which in turn retrieves the woman's location coordinates and Google Maps link from a NEO 6M GPS module. The system then sends this information back to the sender via SMS. This system provides an effective solution for locating women in emergencies, regardless of their mobile device status, and can help improve their safety and security.**

Keywords - live location tracking, women safety, SIM800 L GSM module, Arduino UNO, NEO 6M GPS module, SMS communication, Google Maps link

I. INTRODUCTION

Ensuring the safety and security of women is a crucial concern in today's society. The increasing incidents of harassment, stalking, abduction, and violence against women have brought attention to the need for reliable solutions to protect them in emergencies. However, some women may not be able to use their mobile devices to call for help or send their location information due to various reasons, such as the low battery, network issues, or being forcefully dispossessed of their devices. Therefore, it is necessary to develop alternative means of tracking and locating women in emergencies, even when their mobile devices are turned off or not available.

This paper proposes a system for live location tracking of women in emergencies. The system uses a SIM800 L GSM module, an Arduino UNO microcontroller, and a NEO 6M GPS module to retrieve and transmit accurate and real-time location information about the women. The system is activated by an SMS command "LOC" sent to the SIM800 L GSM module, which communicates with the Arduino UNO and retrieves the location coordinates and Google Maps link from the NEO 6M GPS module. The system then sends this information back to the sender via SMS, enabling them to track the location of the women in emergencies.

The proposed system offers several advantages over existing location-tracking solutions. Firstly, it does not rely on the availability of the woman's mobile device, which is often a limiting factor in emergencies. Secondly, it provides real-time and accurate location information, which can be crucial in time-sensitive scenarios. Thirdly, it uses affordable and widely available components, making it an accessible solution for a wide range of users.

Overall, the proposed system can play a vital role in ensuring the safety and security of women in society, particularly in emergencies. It can help reduce response times and enable timely intervention in case of emergencies. The system can be used by women themselves or by their family members, friends, or caregivers to monitor their location and well-being. The system can also be used by law enforcement agencies and other organizations to improve their emergency response capabilities and enhance the safety of women in the communities they serve.

II. PROBLEM STATEMENT

Women's safety has become a major concern in recent years, with increasing reports of crimes against women, especially in emergencies. In such scenarios, the victim's ability to communicate her location to authorities or family members can be critical for her safety. However, in some cases, the victim's mobile phone may not be available or may be turned off, making it difficult to track her location. This is

a common problem faced by many women, especially in areas with poor network coverage or in situations where the phone battery has died.

To address this problem, a project has been developed that aims to provide live location tracking of women in emergencies when their mobile phones are turned off or not available. The project involves sending an SMS command "LOC" to the SIM800 L GSM module, which is communicated with an Arduino UNO. The Arduino then retrieves the location coordinates and Google Maps link from the NEO 6M GPS module and sends this information as an SMS to the sender who sent the "LOC" command. This project is expected to provide a reliable and efficient solution to the problem of tracking women in emergencies where their mobile phones are not available, thereby improving their safety and security.

III. LITERATURE SURVEY

Women's safety has been a major concern in many countries, especially in developing countries where violence against women is prevalent. In emergencies, when a woman's mobile phone is turned off or not available, it can be difficult to locate her. The use of GPS technology has made it possible to track the location of a person in real-time, and this technology can be used to locate women in emergencies.

There have been many studies on the use of GPS technology for tracking people in emergencies. For instance, the paper [1] proposes a real-time tracking system that uses GPS and GSM technologies to locate people in emergencies. The system uses GPS to track the person's location and GSM to transmit the location data to a central server. The server then sends an alert to the emergency services with the person's location.

The paper [2] introduces a GPS-based tracking system for outdoor activities. The system uses a GPS module to track the location of the person and a GSM module to transmit the location data to a server. The server then displays the location data on a map, which can be used by emergency services to locate the person in case of an emergency.

In the proposed system, a SIM800L GSM module is used to receive SMS commands. The module communicates with an Arduino UNO, which is used to process the commands. The Arduino UNO then retrieves the location coordinates from a NEO 6M GPS module and generates a Google Maps link. This link is then sent back to the sender as an SMS message.

The use of SMS commands to track the location of a person is not a new concept. The paper [3] suggested a system that uses SMS commands to track a person's location. The system uses a GPS module to track the location of the person and a GSM module to transmit the location data to a server. The server then responds with the location data in the form of an SMS message.

The proposed system provides an efficient way to track the location of a woman in emergencies when her mobile phone is turned off or not available. The use of GPS technology in conjunction with the SIM800L GSM module and the Arduino UNO provides an accurate and reliable way to track the location of a person in real time. The system can be easily deployed in any location and can be used by emergency services to locate women in emergencies. The system can be further improved by incorporating additional features such as an alarm system or a panic button, which can be used to alert emergency services in case of an emergency.

IV. EXISTING SYSTEM

The problem arises when a woman is in a helpless or emergency situation and their mobile is grabbed away or not available making it impossible to find their location which affects the safety of women.

In cases where women are at risk of being kidnapped or sexually assaulted, they may attempt to use their mobile phones to contact emergency services or to alert family or friends of their location. However, if their mobile phones are forcefully shut down by the perpetrator, it becomes impossible for them to use location tracking services or emergency communication apps to seek help. This situation can be particularly dangerous in cases where the victim is in an unfamiliar or remote location, making it difficult for rescue

services to locate them quickly. It also increases the risk of physical harm or even death to the victim.

To address this problem, this project proposes a solution that enables women to track their location even if their mobile phones are forcefully shut down. This system can potentially save lives and provide a sense of security to women in emergencies.

Fig. 1: Woman getting abducted

The disadvantages of the above existing system are as follows:

1. Increased risk of physical harm: When women are unable to trace their location, they may become vulnerable to physical harm or violence from the perpetrator. The inability to seek help or alert emergency services can put them in grave danger.

2. Increased risk of abduction: If a woman is unable to trace her location, she may be at a higher risk of being abducted by the perpetrator. This can lead to further violence, sexual assault, or even death.

3. Emotional distress: The inability to trace their location can cause immense emotional distress to the victims, leading to anxiety, depression, and post-traumatic stress disorder (PTSD)

4. Delayed response by law enforcement agencies: When women are unable to trace their location, it can lead to a delay in law enforcement agencies' response, making it more challenging to rescue or locate them.

5. Loss of trust in technology: Women who have experienced such situations may lose trust in technology and may not rely on it for their safety in the future.

6. Psychological impact: The fear of being unable to seek help can cause psychological distress and trauma in women.

7. Reduced confidence in personal safety: Women may feel less confident in their ability to protect themselves and avoid risky situations.

8. Increased vulnerability: Women who cannot trace their location may feel more vulnerable to violence and abuse.

9. Reduced reporting: Women may be less likely to report violence or harassment if they feel that they cannot seek help or protect themselves.

10. Reduced access to public spaces: Women may avoid public spaces due to the fear of being unable to protect themselves in an emergency.

11. Increased dependence on others: Women may become more dependent on others for protection, which can be limiting and may further increase their vulnerability.

12. Reduced quality of life: The fear and uncertainty of being unable to trace their location can negatively impact the quality of life of women.

V. PROPOSED SYSTEM

The safety of women is a growing concern worldwide. It is important to have a reliable and efficient system that can track the location of women in emergencies, especially when their mobile phones are turned off or not available. The proposed system aims to address this issue by providing live location tracking of women in emergencies by sending an SMS command to the SIM800 L GSM module, which communicates with an Arduino UNO board to retrieve the location coordinates from the NEO 6M GPS module and send the Google Maps link as an SMS to the sender.

The implementation of the proposed system involves the following steps:

1. Setting up the hardware components: The SIM800 L GSM module, Arduino UNO board, and NEO 6M GPS module should be connected using the appropriate cables.

2. Programming the Arduino UNO board: The Arduino UNO board should be programmed using the Arduino

Integrated Development Environment (IDE) software to receive and process the SMS command "LOC" from the SIM800 L GSM module, retrieve the current location coordinates from the NEO 6M GPS module, and generate the Google Maps link using the location coordinates.

3. Testing the system: After programming the Arduino UNO board, the system should be tested by sending an SMS command "LOC" to the SIM800 L GSM module and verifying that the Google Maps link is received as an SMS by the sender.

4. Integration with Mobile Application: To provide a user-friendly interface for sending the SMS command and receiving the Google Maps link, the system can be integrated with a mobile application. The mobile application can provide additional features such as sending the SMS command to a pre-defined emergency contact list, automatic location tracking, and real-time monitoring.

5. Deployment: The final step in the implementation of the proposed system is deployment. The system can be deployed in various locations, such as public transportation, schools, hospitals, and other places where women may need assistance in emergencies.

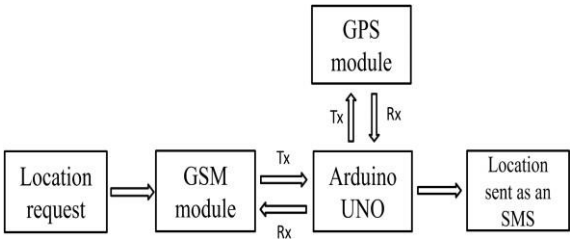

Fig. 2: Block Diagram

VI. RESULT AND DISCUSSIONS

The first step involves sending the location request to the device placed with the woman when her mobile phone is turned off or when she is in an emergency or the location is off, the woman couldn't be traced.

Next, when the device placed with the woman receives the SMS command i.e., the GSM module mobile number receives the command LOC sent by the sender and it communicates with the Arduino. Now the Arduino UNO will communicate with the GPS module to get the latitude and longitude coordinates and generate a google maps link with these coordinates and send this link as a reply to the SMS request sent. Figure 2 shows the implementation of the proposed system.

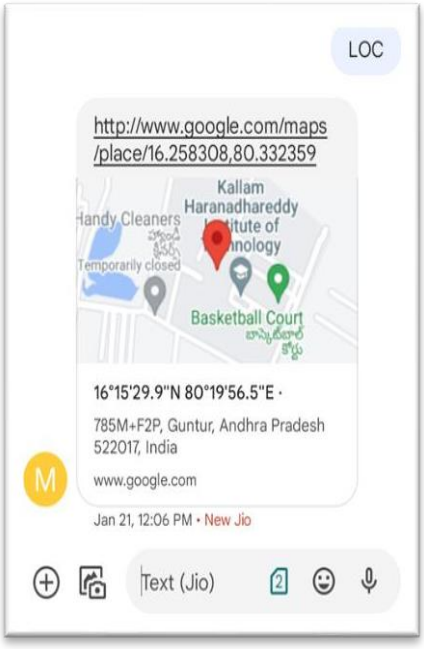

Fig. 3: Result

VII. CONCLUSION

In conclusion, the proposed system for live location tracking of women in emergencies is an innovative solution that uses the latest GPS and GSM technologies to locate women in real-time, even when their mobile phones are turned off or not available. The use of the SIM800L GSM module and the Arduino UNO provides an accurate and reliable way to process SMS commands and retrieve location coordinates from the NEO 6M GPS module.

The system can be easily deployed in any location and can be used by emergency services to locate women in need. Overall, this system has the potential to make a significant impact on women's safety, especially in developing countries where violence against women is prevalent. Further improvements to the system, such as incorporating additional features like an alarm system or panic button, can be explored in the future to enhance its functionality and effectiveness.

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REFERENCES

[1] Y. Zhu and J. Wu, "A Real-Time Tracking System Based on GPS and GSM for Emergency Situations," in IEEE Access, vol. 4, pp. 4170-4177, 2016, doi: 10.1109`/ACCESS.2016.2581924.

[2] M. Wang, H. Liu, J. Li, and X. Wang, "A GPS-based tracking system for outdoor activities," in Proceedings of the 2017 IEEE International Conference on Information and Communication Technology Convergence (ICTC), Jeju Island, South Korea, 2017, pp. 689-692. doi: 10.1109/ICTC.2017.8190945.

[3] A. Abbasi, A. M. Anees, and M. Islam, "A System for Tracking the Location of a Person Using SMS Commands," in 2016 2nd International Conference on Electrical, Computer and Communication Technologies (ICECCT), Coimbatore, India, 2016, pp. 1-5, doi: 10.1109/ICECCT.2016.7510192.

[4] J. S. Deogade and A. S. Bodkhe, "Women Safety System using GPS and GSM," International Journal of Advanced Research in Computer and Communication Engineering, vol. 6, no. 6, pp. 146-151, June 2017.

[5] R. A. S. Bhavani and S. S. Divya, "Smart Women Safety System using GSM and GPS," International Journal of Pure and Applied Mathematics, vol. 118, no. 19, pp. 247-257, 2018.

[6] D. D. Dinesh Kumar and V. E. Balasubramanian, "Smartphone based Women Safety Application using GPS and GSM," International Journal of Innovative Research in Science, Engineering and Technology, vol. 6, no. 9, pp. 13996-14000, Sept. 2017.

[7] H. S. Rasel, R. A. Shaikh, and S. G. Kalbande, "Smart Women Security System using GPS and GSM," International Journal of Computer Science and Mobile Computing, vol. 3, no. 8, pp. 248-253, August 2014.

[8] N. R. Tariq, M. R. Khattak, and N. Ahmad, "GPS and GSM based Women Security System using Arduino," International Journal of Scientific and Engineering Research, vol. 7, no. 2, pp. 339-346, February 2016.

[9] A. V. Jadhav and A. S. Kadam, "Design and Implementation of Women Safety System using GSM and GPS," International Journal of Engineering Research and Applications, vol. 4, no. 5, pp. 58-61, May 2014.

[10] V. Singh and N. Sharma, "Women Security System using GPS and GSM," International Journal of Research in Advent Technology, vol. 2, no. 4, pp. 223-226, April 2014.

[11] S. S. Jambagi and S. K. Jadhav, "Smart Women Safety System using GPS and GSM," International Journal of Scientific Research in Computer Science Applications and Management Studies, vol. 5, no. 2, pp. 85-91, February 2016.

[12] S. Bhattacharya and S. Mukherjee, "Design and Development of a Low-Cost GPS-based Tracking System for Women's Safety," Journal of Circuits, Systems, and Computers, vol. 28, no. 12, article no. 1950193, Dec. 2019.

[13] R. Nandini, B. N. H. Ramesh, and M. K. Shree Krishna, "Design and Implementation of GPS and GSM based Women Safety System," International Journal of Engineering and Technology, vol. 9, no. 4, pp. 2823-2828, 2017.

[14] S. L. Deore and K. M. Khot, "Women Safety System using GSM and GPS with Panic Button," International Journal of Advanced Research in Computer Science and Software Engineering, vol. 7, no. 9, pp. 654-658, September 2017.

[15] Kumar, S., & Meena, R. (2017). Smart security system for women safety using IoT. International Journal of Advanced Research in Computer Science and Software Engineering, 7(3), 454-458.

[16] Agarwal, S., Kaur, M., & Gupta, A. (2017). Women safety system using GPS and GSM. International Journal of Advanced Research in Computer Science and Software Engineering, 7(7), 28-30.

[17] Venkatesh, R., & Hema Latha, R. (2018). Smart system for women safety using IoT. International Journal of Emerging Trends & Technology in Computer Science, 7(2), 36-40.

[18] Nayak, S., & Paul, S. (2018). Real-time monitoring of women's safety using IoT. International Journal of Computer Science and Mobile Computing, 7(4), 196-203.

[19] Biswas, S., & Dey, R. (2019). Smart wearable device for women safety using IoT. International Journal of Engineering and Advanced Technology, 8(3), 2333-2337.

[20] Mittal, S., & Sehgal, S. (2019). A review on women safety systems. International Journal of Advanced Trends in Computer Science and Engineering, 8(4), 50-55