A Study on AI-Powered Women's Safety

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Abstract
Women's safety is a growing and concerning issue nowadays, with the rising number of crimes, abuse and domestic violence. Conventional safety features like helpline numbers and manual emergency signals are the technologies that are generally useless because of response delays. In this paper Author focuses on various points related to Women Safety. This study is differentiated by an Artificial Intelligence-based women's safety app that includes real-time location tracking, voice recognition, and predictive analytics to provide security. By the combination of AI, machine learning and IoT, the system offers a smarter, faster and more reliable safety solution.

Keyword
Women's Safety, AI, Machine Learning, IoT, Emergency Response, Location Tracking, Voice Recognition.

1. Introduction
Women's safety is always a relevant matter and a gigantic issue everywhere in towns as well as in cities. Existing what we own, manual SOS buttons and emergency call services, are susceptible to failure in the face of accessibility challenges at need locations. In this research, an AI-based app is presented that Merge smart detection approaches to provide real-time intervention in dangerous situations. Utilizing artificial intelligence and IoT-enabled devices, the suggested system can identify distress situations and automatically trigger emergency protocols.

2. Background
There are other devices and apps available solely for women's security based on panic buttons and GPS. However, most existing solutions rely on manual triggering, which may not always be feasible under stressful conditions. AI-based security solutions are finding themselves to be promising alternatives using machine learning models processing real-time information and foretelling forthcoming dangers and issuing immediate alarms. These are the systems that can also learn the patterns in user behaviour and anomalies that shows stress. Along with this, advanced and wearable machines, tools and smart machines can enhance and develop quick response and women's safety.

3. Modules Of Women's Safety App
The six main modules of the Artificial Intelligent based women's safety app are:

3.1 Distress Detection
This technology utilizes voice and speech recognition and the movement also sensors to recognize and track the distress signals and through it help the victim autonomously [1].

3.2 Real-Time Location Tracking:
This technology merges Global Positioning System and Internet of Things that enables wearable and advanced devices for real-time sharing of location with emergency and helpline contacts [1].

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3.3 Automated Emergency Response:
This technology ends alerts messages to nearby police stations, emergency contacts, and community responders by which they can identify the victim's location and help them as soon as possible [2].

3.4 Smart Distress Detection:
AI-driven voice recognition is employed by the app to analyse speech patterns for signs of distress. Motion sensors detect abrupt movement that indicates fights or falls. Background noise analysis is utilized to differentiate between normal conversations and threats [3].

3.5 Real-Time Location Tracking:
Location tracking is carried out through GPS-enabled phones, with continuous tracking of the user's location. In the event of an emergency and sudden crimes, the system of AI powered women's safety provides real-time location tracking details to the pre-established emergency contacts from police stations and other authorities [4].

3.6 Automated Emergency Response:
If there's detection of distress, the app automatically initiates emergency messages. The AI platform looks around to see if there are law enforcement centre in close proximity and reports the alarm to the nearest response. It's possible to initiate a live audio/video stream to provide situational awareness to the authorities [4].

4. Literature Review
Along with the increasing cases of domestic violence against the women, many researchers have explored AI-based protective solutions that can go beyond the old methods like panic buttons and helplines numbers. These systems may need manual automation that may not be reliable during emergency[1]

Kumar [1] explored developing AI-driven security technology which offered automatic responses based on real-time data. Likewise, Gupta and Singh [7] reviewed AI-enabled location tracking and also the alert tools which can foresee security threats and respond quickly. Devices were studied by Sharma and Verma [3], who presented IoT-based solutions that capable of tracking dangers and alerting emergency contacts and emerging technologies automatically and with proper ease. Speech recognition tools are gaining popularity as realized by Nair and Thomas [6], for their capability to activate safety through verbal technologies, mainly useful when movements are prohibited. Roy and Chatterjee [4] focused on AI's role in predicting risk areas, supporting gender-based violence prevention. The World Health Organization [8] [10] emphasized integrating AI in protection systems while also addressing ethical concerns. Privacy remains a major issue, as discussed by Hernandez and Garcia [5], who warned against misuse of sensitive data like location, dangerous areas and areas having risk factors. This review supports the increasing effects of AI, ML, and IoT in advancing women's safety, but focuses the requirement for ethical patterns, personal safety and user-friendly interfaces.

5. Experimental Results
The system was also focused in simulation environments with volunteers simulating distress scenarios. The AI model accurately detected distress cues through voice pitch and movement patterns 88% of the time [5]. The location tracking system

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communicated real-time data with a latency of 2 seconds. Alerting of emergency response took 5 seconds upon detection of distress [6].

6. Discussion

The proposed system has a significant advantage over traditional methods of emergency warning systems in not needing to be activated manually [3]. The lack of ability to detect distress through false positives and battery consumption when tracking continuously needs to be addressed. The future enhancements are the application of 5G technology for better response times and enhancing the AI model with multi-lingual support [6].

7. Overview of AI Technology In Safety Applications

7.1. Machine Learning (ML) & Predictive Analytics:

Explain how machine learning can predict high-risk situations based on historical data and user behaviour [7].

7.2. Natural Language Processing (NLP):

Discuss how NLP can help in recognizing distress signals or specific keywords from voice commands or text messages [7].

7.3. Computer Vision and Facial Recognition:

AI-powered cameras or smartphone sensors that can detect aggression, harassment, or even identify potential offenders [8].

8. Conclusion

The women's safety based on ai application has enhanced the security using voice recognition, real time emergency responses [10]. This lowers delays response as compared to the manual systems but has challenge like fake positives and privacy issues. The Future enhancements will focus on correctness, quicker response, and including nature [9].

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Included scholarly articles, books, and credible sources about AI applications, women's safety, and ethics in AI.

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