INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD)
© 2026 IJNRD | Volume 11, Issue 4, April 2026 | ISSN: 2456-4184 | IJNRD.ORG

SafeBot : An AI- Agnet for Enhancing Women Safety With Real-Time Monitoring And Alerts

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Abstract- Women safety has emerged as a critical societal issue due to the increasing number of crime incidents and delays in emergency response systems. Existing safety mechanisms often rely on manual intervention and lack real-time intelligence, limiting their effectiveness during critical situations.

This paper presents SafeBot, an AI-based intelligent system designed to enhance women safety through real-time SOS alerts and location tracking. The proposed system enables users to trigger an emergency alert that automatically shares their live location with nearby police stations and trusted contacts.

The system integrates Artificial Intelligence (AI), Global Positioning System (GPS), and cloud-based communication to ensure rapid response and improved safety. The framework focuses on providing a reliable, scalable, and efficient solution for real-time emergency assistance.

Keywords— Women Safety, AI Agent, SOS Alert System, GPS Tracking, Emergency Response,Real-Time Monitoring, Cloud Computing.

1.Introduction

Women safety has become one of the most critical and pressing concerns in modern society due to the continuous rise in crimes such as harassment, assault, domestic violence, and kidnapping. Despite the implementation of strict laws and various safety initiatives, incidents against women continue to increase, highlighting the urgent need for more effective and technologically advanced safety solutions. In many emergency situations, the lack of immediate assistance and delayed response from authorities often worsens the situation, making it crucial to develop systems that can provide real-time support.

Traditional safety mechanisms, such as helpline numbers, manual reporting systems, and basic mobile safety applications, are often inadequate in handling real-time emergencies. These systems heavily depend on user interaction, where the victim must manually call or send alerts, which may not always be possible in critical or life-threatening situations. Additionally, these methods suffer from limitations such as delayed communication, lack of precise location tracking, and minimal coordination with law enforcement agencies. As a result, the effectiveness of such systems is significantly reduced during high-risk scenarios.

With the rapid advancement of technology, especially in the fields of Artificial Intelligence (AI), Internet of Things (IoT), cloud computing, and mobile communication, there is a strong potential to revolutionize women safety systems. AI-based solutions can analyze real-time data, identify patterns, and make intelligent decisions without human intervention. Similarly, GPS tracking systems can continuously monitor user location and environmental conditions, enabling faster and more accurate emergency response. Cloud computing further enhances system performance by ensuring seamless data storage, processing, and communication between different components of the system.

In recent years, several smart safety applications and wearable devices have been developed to improve personal security. These systems provide features such as SOS alert buttons, live location sharing, and emergency notifications. However, most of these solutions still lack proper integration of advanced technologies, real-time intelligence, and automated decision-making capabilities. They are often limited by issues such as network dependency, false alerts, lack of predictive analysis, and weak connectivity with emergency services. Therefore, there is a need for a more intelligent, reliable, and fully integrated system that can overcome these challenges.

To address these limitations, this paper proposes SafeBot, an AI-based intelligent agent designed to enhance women safety through real-time monitoring and emergency response. The system enables users to trigger an SOS alert, which automatically shares their real-time location with nearby police stations and trusted contacts. Unlike traditional systems, SafeBot integrates AI algorithms to process emergency requests, identify the severity of situations, and ensure faster and more efficient response.

The proposed system combines multiple technologies, including Artificial Intelligence for intelligent decision-making, GPS for accurate location tracking, IoT for continuous monitoring, and cloud-based communication for real-time data exchange. This integration allows SafeBot to provide a scalable, reliable, and efficient solution for handling emergency situations. Furthermore, the system aims to minimize response time, improve coordination with authorities, and enhance overall user safety.

2.Review Of Literature

Women safety has gained significant attention in recent years, leading to the development of various technology-driven solutions aimed at improving personal security and emergency response. Early research in this domain primarily focused on GPS and GSM-based systems, which enabled users to send location-based alerts to predefined contacts during emergency situations. These systems were simple, cost-effective, and widely adopted; however, they lacked real-time intelligence and automation.

With the advancement of mobile technologies, several smartphone-based applications were introduced that provided features such as one-touch SOS alerts, live location sharing, and emergency messaging services. Studies such as those by Patel et al. (2020) and Jain et al. (2021) emphasized the usability and accessibility of mobile-based safety solutions. However, these applications still relied heavily on manual triggering and were limited by network dependency and delayed response mechanisms.

Recent research has shifted towards the integration of Artificial Intelligence (AI) and Machine Learning (ML) techniques to enhance the effectiveness of women safety systems. AI-based models are capable of analyzing behavioral patterns, detecting anomalies, and predicting potential threats in real time. For instance, Kumar et al. (2022) proposed an AI-based safety system that uses machine learning algorithms for intelligent threat detection. Similarly, Singh and Mehta (2023) explored the use of AI combined with IoT devices to create smart monitoring systems capable of continuous surveillance and automated alert generation.

In addition to AI, the incorporation of the Internet of Things (IoT) has significantly improved system capabilities. IoT-based wearable devices, such as smart bands and safety pendants, enable continuous tracking and automatic alert triggering without requiring active user intervention. Research by Gupta et al. (2022) and Verma et al. (2021) demonstrated the effectiveness of wearable safety devices in providing real-time monitoring and quick emergency response. However, these systems face challenges such as battery limitations, hardware constraints, and reliability issues.

Furthermore, cloud computing technologies have been integrated into modern safety systems to enable efficient data storage, processing, and communication. Cloud platforms facilitate real-time data transmission between users, emergency contacts, and law enforcement agencies, thereby reducing response time and improving system scalability. Studies have also explored the use of AI-based chatbots and virtual assistants (Das et al., 2023) to provide immediate user support and guidance during emergencies.

Despite these technological advancements, several limitations persist in existing systems. Many solutions lack proper integration between AI, and emergency response services, resulting in fragmented and inefficient operations. Additionally, most systems depend on manual activation, which may not be feasible in high-risk situations. Issues such as false alerts, data privacy concerns, limited connectivity with law enforcement agencies, and absence of predictive analytics further reduce system reliability and effectiveness.

Therefore, there is a clear need for a comprehensive, intelligent, and integrated safety system that combines AI, IoT, GPS, and cloud technologies to provide real-time monitoring, automated decision-making, and seamless communication with emergency services. The proposed system, SafeBot, aims to address these limitations by offering a unified platform that enhances response time, improves accuracy, and ensures better coordination between users and authorities.

3.Research Gap

S.No.	***Identified Gap***	***Existing System Issue***	***Proposed Solution (SafeBot)***
1	Manual Activation	High dependency on user action during emergencies	One-tap quick SOS triggering mechanism
2	Delayed Response	Slow communication with emergency services	Real-time online alert system
3	Lack of Integration	Disconnected and independent system components	Unified web/mobile-based platform
4	Lack of Intelligence	Absence of smart decision-making capabilities	AI-based intelligent processing
5	Limited Connectivity with Authorities	Weak integration with law enforcement agencies	Direct online alert delivery to authorities
6	Absence of Predictive Analysis	Inability to detect potential threats	AI-based risk analysis
7	Poor User Interface	Complex and non-user-friendly applications	Simple and intuitive user interface
8	Lack of Real-Time Tracking	Delay in location updates	Live GPS-based location tracking
9	False Alerts	High number of unnecessary notifications	AI-based alert filtering mechanism

10	Low Accuracy	Inaccurate location detection	Improved GPS accuracy
11	No Voice Support	Dependence on manual interaction	Voice-based SOS triggering
12	Partial Automation	Presence of multiple manual steps	Fully automated alert system
13	Weak Data Handling	Risk of data loss and delayed processing	Cloud-based data management system
14	Security Issues	Risk of data breaches and privacy concerns	Secure authentication and data encryption
15	Lack of Real-Time Processing	Static and delayed system response	Real-time AI-based processing
16	Limited Scalability	Inability to handle a large number of users	Scalable cloud infrastructure
17	Generic Alert Mechanism	Same alert sent to all contacts without prioritization	Context-aware intelligent alert system
18	No Alert Confirmation	No feedback on whether help has been received	Alert acknowledgment mechanism
19	Lack of Central Monitoring	Data is scattered and not centrally managed	Centralized cloud-based monitoring
20	No System Feedback	No performance or status tracking	Real-time system status tracking

4.Proposed System

The proposed system, SafeBot, is an AI-based intelligent agent designed to enhance women safety through real-time monitoring and emergency response.

The system allows users to trigger an SOS alert during emergencies, which automatically shares their live location with nearby police stations and emergency contacts. The AI agent processes the request and ensures that alerts are delivered quickly and efficiently.

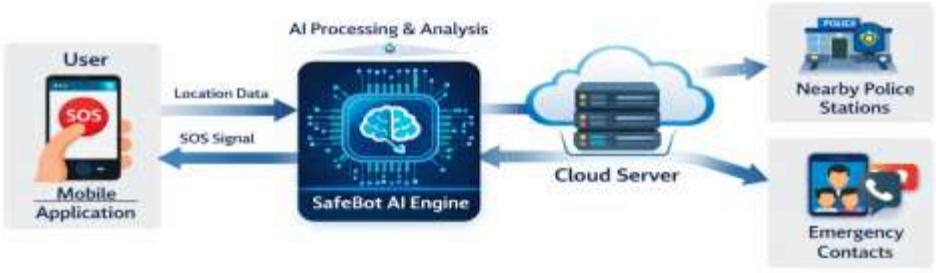

Fig. 1: Enhanced System Architecture of SafeBot

The architecture of SafeBot represents a structured and integrated system designed to provide real-time emergency assistance for women safety. The system consists of four major components: the User Mobile Application, SafeBot AI Engine, Cloud Server, and Response Units (Police Stations and Emergency Contacts).

At the initial stage, the user interacts with the system through the mobile application. In case of an emergency, the user triggers an SOS alert, which captures real-time location data using GPS. This information is immediately transmitted to the SafeBot AI Engine.

The SafeBot AI Engine acts as the core processing unit of the system. It analyzes the received data, identifies the severity of the situation, and determines the nearest available help. The AI component ensures intelligent decision-making and minimizes response time.

After processing, the data is forwarded to the Cloud Server, which manages data storage, communication, and system coordination. The cloud infrastructure ensures reliable and scalable transmission of alerts to the respective response units.

Finally, the alert is delivered to nearby police stations and emergency contacts. These entities receive the user's real-time location and emergency details, enabling them to take immediate action. The bidirectional flow of data ensures continuous monitoring and effective communication throughout the emergency process.

Overall, this architecture enables seamless integration of mobile technology, artificial intelligence, and cloud computing to provide a fast, reliable, and efficient women safety system.

5.Methodology

The SafeBot system operates in three major stages.

Input Stage: The user activates the SOS button during an emergency situation.

Processing Stage: The AI agent processes the request, retrieves real-time GPS location, and identifies nearby police stations or emergency contacts.

Output Stage: The system sends alerts along with location details and activates emergency response mechanisms.

The methodology ensures efficient handling of emergency situations by minimizing response time and maximizing reliability.

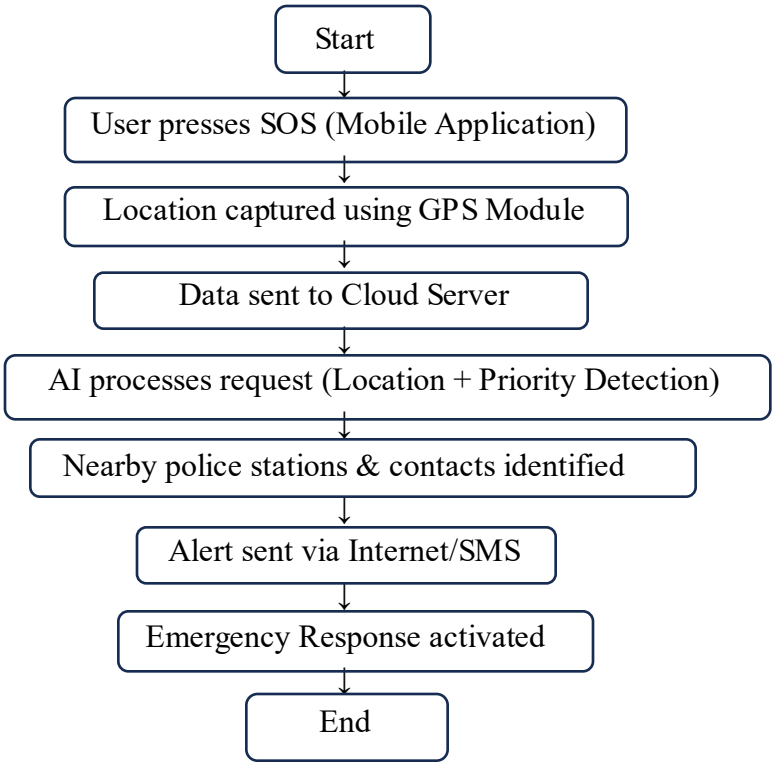

Fig. 2 "Flowchart of SafeBot Emergency Response System"

6. Challenges and Features of Women Safety Systems

S. No.	*Author & Year*	*Methodology*	*Key Features*	*Challenges*
1	Sharma et al. (2021)	GPS + GSM System	Real-time location tracking	Network connectivity issues
2	Patel et al. (2020)	Mobile Application	Easy SOS alert triggering	High dependency on manual input
3	Kumar et al. (2022)	AI-Based System	Intelligent threat detection	Requires large data for training
4	Singh & Mehta (2023)	AI + Cloud System	Smart monitoring and analysis	System complexity
5	Gupta et al. (2022)	Mobile-Based System	Quick alert communication	Battery consumption issues
6	Verma et al. (2021)	Embedded System	Fast emergency triggering	Hardware limitations

7	Reddy et al. (2022)	GPS Tracking System	Accurate location tracking	Signal delay in remote areas
8	Das et al. (2023)	AI Chatbot	User assistance and support	Limited response capability
9	Mehta et al. (2022)	Survey-Based Study	Comparative analysis	No real-time implementation
10	Jain et al. (2021)	SOS Alert System	Quick alert mechanism	Lack of AI integration
11	Kumar et al. (2020)	Cloud-Based System	Data storage and monitoring	Privacy concerns
12	Singh et al. (2021)	Tracking System	Continuous monitoring	Accuracy limitations
13	Sharma et al. (2022)	Android Application	User-friendly interface	Internet dependency
14	Gupta et al. (2022)	Emergency Response System	Fast alert delivery	Scalability issues
15	Verma et al. (2021)	Sensor-Based System	Automatic alert triggering	False alerts
16	Singh et al. (2023)	AI Detection System	Predictive analysis	High implementation cost
17	Gupta et al. (2021)	Monitoring System	Real-time data processing	Security risks
18	Das et al. (2022)	Location-Based System	Geo-based alerts	Delay in response
19	Mishra et al. (2023)	Machine Learning Model	Risk prediction	Accuracy challenges
20	Khan et al. (2022)	AI Surveillance System	Continuous monitoring	Privacy concerns

8.Conclusion

This paper presents SafeBot, an AI-based intelligent system designed to enhance women safety through real-time SOS alerts, location tracking, and automated emergency response. The proposed system effectively addresses the limitations of traditional safety mechanisms, which often rely on manual intervention and suffer from delayed communication and lack of real-time intelligence. By integrating advanced technologies such as Artificial Intelligence (AI), Global Positioning System (GPS), and cloud computing, SafeBot provides a comprehensive and reliable solution for handling emergency situations.

One of the key contributions of this system is its ability to provide instant emergency assistance by enabling users to trigger SOS alerts that automatically share their real-time location with nearby police stations and trusted contacts. This significantly reduces response time, which is a critical factor in emergency scenarios. The

incorporation of an AI engine allows the system to process data intelligently, identify the severity of situations, and ensure that alerts are directed to the most relevant response units.

Furthermore, the integration of cloud-based infrastructure enhances the scalability and efficiency of the system by ensuring seamless data transmission and storage. The system architecture supports continuous monitoring and real-time communication, making it highly effective in dynamic and high-risk environments. Unlike existing systems, SafeBot focuses on providing a unified and automated solution, minimizing user dependency and improving overall reliability.

Despite its advantages, the proposed system may face certain challenges, such as dependency on internet connectivity, data privacy concerns, and the need for continuous system updates to handle evolving threats. However, these challenges can be addressed through future improvements, such as incorporating offline alert mechanisms, enhancing data encryption techniques, and integrating advanced predictive analytics for better threat detection.

In the future, SafeBot can be further enhanced by integrating wearable devices, voice-activated emergency triggers, and real-time video/audio streaming features. Additionally, collaboration with law enforcement agencies and smart city infrastructure can significantly improve the effectiveness of the system. The inclusion of machine learning models for predictive analysis can also enable the system to detect potential threats before they occur, thereby shifting from reactive to proactive safety measures.

In conclusion, SafeBot demonstrates how modern technologies can be effectively utilized to develop a smart, efficient, and scalable women safety system. The proposed solution not only improves emergency response time but also enhances user confidence and sense of security. With further development and real-world implementation, SafeBot has the potential to play a significant role in creating a safer environment for women and contributing to the advancement of intelligent public safety systems.

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