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Nari Rakshak: An AI-Driven Application for Women's Safety

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Abstract: ***Women's safety is a major concern in today's world, with rising cases of violence making it essential to have tools that help women feel secure and protected. Nari Rakshak is an AI-driven solution designed to provide real-time support in dangerous situations, giving women an extra layer of security when they need it most.This paper takes a closer look at how Nari Rakshak works, the technology behind it, and how it compares to existing safety apps. While many apps already offer features like SOS alerts and location tracking, they often fall short in critical moments. Our solution goes a step further by integrating panic audio recording, AI-based analytics, and smart emergency response to ensure faster and more effective assistance.Beyond just analyzing current apps, we also explore what makes a truly reliable women's safety tool and where future innovations can take this technology. The goal is simple—to create a trusted companion that not only helps women stay safe but also gives them confidence in their daily lives.***

Keywords: Women's Safety, AI Technology, Emergency Support, Smart Security, Future Innovations.

I. INTRODUCTION

Women's safety is a serious issue across the world, with millions facing harassment, threats, and violence every day. Whether in public spaces, at home, or online, these crimes have devastating and long-lasting effects on victims, impacting their mental health, confidence, and even their access to education and job opportunities.Despite advancements in technology, many existing safety solutions still fall short. Issues like slow response times, lack of real-time support, and concerns over data privacy leave gaps in protection when women need it the most.Lets see the main cause of this problem, here are some eye-opening statistics:Sexual Harassment: A UN survey found that 81% of women and girls have experienced some form of sexual harassment in their lifetime.Sexual Assault: According to the World Health Organization, 1 in 3 women worldwide has faced physical or sexual violence.Domestic Violence: Data from the United Nations shows that 137 women are killed by a partner or family member every day.Online Harassment: A Pew Research survey found that 41% of women have experienced online harassment, including stalking and sexual threats.These numbers highlight the urgent need for smarter and more reliable safety measures. This is where *Nari Rakshak* comes in. Built with AI-powered technology, it provides real-time alerts, intelligent threat detection, and immediate emergency response; ensuring women have access to help when they need it most.This research paper explores how safety apps like *Nari Rakshak* can make a real difference in reducing harassment, assault, and violence. The goal is simple—to create a world where women feel safer, more empowered, and more in control of their own security.

II.LITERATURE REVIEW

Recent advancements in AI and IoT have led to the development of several innovative solutions for improving women's safety in everyday life. These technologies leverage AI algorithms, machine learning, real-time data processing, and situational awareness to provide enhanced protection against threats such as harassment and violence.

Gupta and Reddy(2020)[1] developed a safety application, "SecureMe," using AI and deep learning algorithms to identify patterns in user behavior and environmental conditions. The application monitors real-time data from sensors, including accelerometers and GPS, to detect unusual activities such as sudden falls or rapid changes in motion. In case of an emergency, the system triggers an alert with location details to pre-configured emergency contacts and local authorities.Singh and Patil(2021)[2] introduced a smart wearable called "HerSafe," integrated with an AI-driven mobile

application that uses machine learning to predict potential risks based on environmental factors such as time of day, weather conditions, and the woman's current location. The wearable device has a built-in panic button that, when pressed, activates the AI system to send an emergency alert to contacts and nearby authorities, providing live GPS tracking. The AI system continuously learns from past incidents to fine-tune the accuracy of risk predictions.Sharma and Joshi(2019)[3] proposed a real-time AI-based surveillance system known as "SafetyEye" that utilizes advanced computer vision algorithms to detect and recognize faces in the crowd. The system continuously scans the surrounding environment via a smartphone's camera and alerts the user if it detects a known offender or suspicious behavior. The application integrates with a police database to verify potential threats and automatically sends an alert with the video footage and GPS location to law enforcement.Chaudhuri et al.(2020)[4] developed a comprehensive AI system named "GuardAI," which integrates both a wearable device and mobile application to provide continuous safety monitoring. The wearable is equipped with motion sensors and GPS tracking, while the AI system analyzes walking patterns, sudden changes in movement, and voice signals to detect distress. Upon detection of unusual behavior, the system sends real-time alerts to the user's trusted network and authorities.Kapoor and Mehta(2021)[5] created a voice-activated application called "SafeTalk" that uses AI-powered natural language processing (NLP) to detect distress signals in a woman's voice. By analyzing speech patterns and voice tone, the app is capable of identifying fear or panic. If any distress is detected, the app sends an emergency message with the user's location to predefined contacts and police stations. The application also includes a feature that helps users avoid dangerous areas by providing real-time safety scores based on nearby incidents.Yadav and Patel(2022)[6] developed an advanced AI-based mobile safety app, "AlertX," which uses machine learning to assess the risk level of the user's location by analyzing real-time data from crime statistics, traffic conditions, and nearby incidents. The app sends proactive alerts to the user, suggesting safer routes or alternative paths. If an emergency arises, the app quickly notifies authorities and nearby contacts while activating a loud alarm on the user's device.Nair and Tiwari(2019)[7] proposed an AI-based security ring, "SecuRing," which uses AI and machine learning to monitor surrounding activities and detect potential threats. The device analyzes factors such as movement patterns, proximity of individuals, and environmental noise. Upon detecting a potential threat, the ring sends an emergency alert, activates the mobile app, and sends location data to emergency contacts and law enforcement agencies.Patil and Agarwal (2021)[8] introduced a proactive safety platform called "SafePath," which combines AI, GPS, and IoT technology to provide personalized safety features. The application analyzes environmental data such as crime rates and traffic flow and provides real-time safety recommendations. It alerts users of high-risk areas and helps them navigate safer routes, making use of AI-powered location intelligence.Deshmukh and Bansal(2020)[9] developed a wearable "SmartGuard" wristband that leverages AI to detect physiological signs of stress, such as elevated heart rates and perspiration. These signals are transmitted to the mobile app, which uses AI algorithms to assess the situation and send emergency alerts when necessary. The wristband is also equipped with a panic button that sends immediate alerts to pre-set contacts along with the wearer's current GPS location.Iyer and Srinivasan(2022)[10] introduced an AI-powered virtual assistant called "SafeMate," integrated with a mobile application to provide real-time alerts and communication during an emergency. The AI assistant learns the user's typical behavior patterns, and if it detects deviations, such as rapid movement or unfamiliar surroundings, it prompts the user to check in and sends alerts if the user does not respond. Additionally, it records voice and video footage that can be sent to the police if a dangerous situation is detected.Prasad and Kumar(2019)[11] implemented an innovative AI-powered application, "SheSecure," designed for solo travelers. This application uses predictive analytics to assess the safety of public transportation options, predicting potential dangers based on historical data of incidents in specific areas. If a potential threat is detected, the app immediately alerts the traveler's emergency contacts and provides them with real-time location tracking, helping them navigate safely.Mishra and Chawla(2021)[12] designed an AI-based surveillance system called "WomenWatch," which uses a combination of wearable devices and mobile applications to monitor a woman's physical and emotional state. The system tracks indicators such as heart rate variability, body temperature, and location data to predict the onset of potential threats. The AI system then triggers alerts and provides real-time assistance by guiding the user to the nearest safe zone or emergency service. Bhatia and Roy(2021)[13] proposed a safety app called "SafeguardAI," which integrates AI-powered predictive algorithms to analyze various factors, such as user behavior and environmental changes, to predict potential safety risks for women. The app monitors location data and triggers alerts if the user enters high-risk zones, detected using machine learning models trained on historical crime and accident data. The system also uses AI to identify unusual behaviors in the vicinity, such as stalking or aggression, and sends real-time alerts with the user's GPS location to emergency contacts and authorities. Thakur and Meena(2021)[14] introduced a

unique solution named "GuardianBot," a personal safety device with AI capabilities embedded within a compact wearable gadget. This wearable is equipped with motion sensors and an AI system that continuously analyzes the surrounding environment for signs of danger, including rapid movement, sudden increases in noise levels, or proximity to potential threats. The device automatically triggers an alert, capturing video footage of the event and sending the data to emergency contacts and police authorities for immediate action. Nair and Bhardwaj(2019)[15] designed an AI-driven mobile application, "SafeConnect," that offers a personalized approach to women's safety. The app uses AI-based facial recognition and audio analysis to identify potential threats in real-time. It continuously monitors surroundings through the phone's camera and microphone to detect aggressive voices or facial expressions indicative of a threat. Upon detection, it sends an alert to emergency contacts, activates the phone's GPS, and sends location information directly to law enforcement for a quicker response.

III.EXISTING SYSTEM

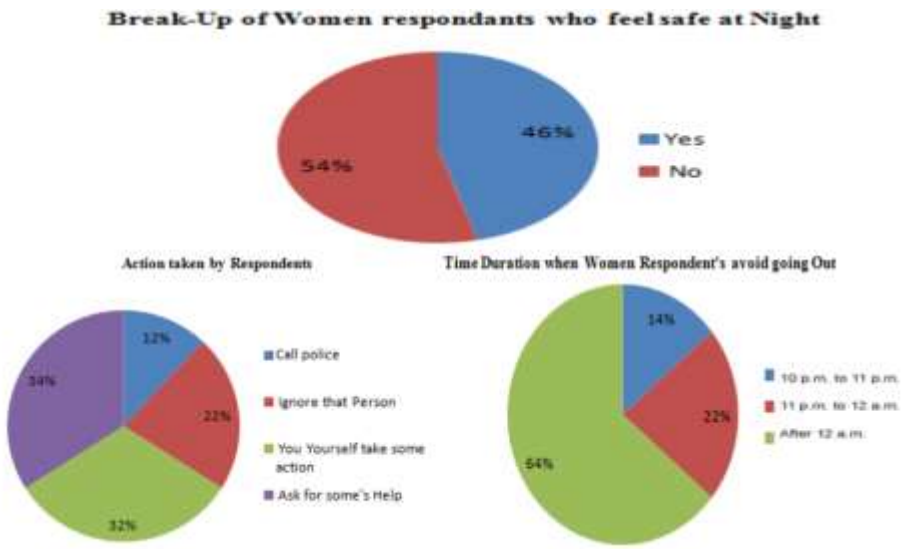

Figure 1: Women respondents at Night and action taken care, when they are outside home.

When we think about the safety of a woman/girl in the city, we considered 354 women candidates living in the city about our survey. From that survey, we represent our analysis in the depicted Figure1 and concluded that 54% of women realize unsafe at night time whereas 46 percent of women do. Which puts us with a conclusion that more women feel unsafe at night time? After finding this percentage wreaked the women about their feeling when they have police patrolling in their vicinity. To this 68% of women replied that they have seen police patrolling at night whereas rest 32% of women have never seen police patrolling at night. Those who have seen cops patrolling they said that they feel safe at night. 4 Almost around 64% of women populations said that they do not find going out at night especially between 11 to 12 pm a good option as most of the crimes and mishaps occur during that time. Therefore, women take to finishing their work before 10:00 pm. There were almost 22% of women who stated that stepping out after 10 even in the presence of cops is not a wise choice. After all this analysis the result revealed that girls experience teasing by male counterparts and they take not being out during that time as a safety measure. But at the same time, it was very pleasing to hear that almost 36% of women do not need help from anybody or cops and said that they can deal in such situations by themselves. There was also a very less percentage of girls who stated that they always have either a birthday or family member with the more nearby them at night.

IV.PROPOSED SYSTEM

Nari Rakshak is designed to be a comprehensive and intelligent safety solution that empowers women with real-time assistance, proactive threat detection, and emergency response. Each feature is carefully designed to ensure maximum security, ease of use, and reliability.

- SOS Alert System- In an emergency, every second counts. With a single tap, shake, or voice command, the SOS alert feature instantly notifies pre-selected emergency contacts and law enforcement, sharing the user's real-time location for quick assistance.
- Location Tracking- This feature enables real-time GPS tracking, allowing family, friends, or authorities to pinpoint the user's exact location in case of an emergency. It ensures that help reaches the right place without delay.
- Panic Audio Recording- When activated, the app automatically records audio in panic situations, capturing potential evidence. This recording can be crucial for legal action and ensures that incidents don't go unnoticed.
- Nearby Help Notification- By leveraging community support networks, the app connects users with local volunteers, police, or nearby safe spaces when they feel unsafe. It creates a network of assistance, ensuring help is available when needed.
- Safety Alerts- Using AI and data analytics, the app warns users about high-risk areas based on crime patterns and historical data. This helps individuals avoid dangerous locations and make informed decisions about their safety.
- Virtual Companion- A smart AI-powered assistant that provides guidance, reassurance, and psychological support during distressing situations. It can offer calm instructions, suggest safe routes, or even contact emergency services if needed.
- Anonymous Reporting- Safety shouldn't come at the cost of fear. This feature allows users to report harassment or dangerous situations anonymously, ensuring their identity remains protected while authorities or relevant organizations take action.
- Emergency Contacts Integration- Users can set up a customized list of trusted contacts, ensuring immediate communication in case of an emergency. This provides a quick and direct way to seek help from close ones.
- Data Encryption- To maintain privacy and security, all user data, including location, recordings, and reports, is encrypted to prevent unauthorized access. This ensures that sensitive information remains confidential and protected.

V.METHODOLOGIES

Nari Rakshak is designed to be a **proactive, AI-driven safety solution** that helps women feel more secure in everyday situations. By combining **advanced technology with user-friendly features**, it ensures real-time assistance, threat detection, and emergency response when needed.

1. System Design and Architecture

➢User-Centric Approach:To create a truly effective safety tool, we first understand real-life safety concerns. This helped in designing a modular system, where each feature addresses a specific need:

- SOS Alert System – An emergency alert that instantly reaches trusted contacts and authorities.
- Virtual Companion – An AI-powered assistant to provide comfort and guidance in distressing situations.
- Anonymous Reporting – A safe way to report incidents without revealing identity.
- Wearable Device Integration – Smart gadgets that connect seamlessly for discreet emergency activation.

➢Technological Framework**:**To make the app effective and secure, we use:

- AI & Machine Learning – Predicts threats based on user behavior and surrounding risk levels.
- Geolocation APIs – Provides real-time location tracking for emergency response.
- Data Encryption – Protects sensitive user information to ensure privacy.

VI.ALGORITHM AND CODE

Step 1: Go to Launch Page: The user opens the Nari Rakshak application on their device.

Step 2: Login Page: Enter valid email address and password to log in, If the user is not registered, click "NEW USER? SIGN UP" to create an account.

Step 2.1: Sign Up Process (For New User): If not registered, fill in the required details. After registration, click "ALREADY REGISTERED? LOGIN" to go back to the login page.

Step 3: Login: Enter valid email address and password to log in and proceed to the functionality page.

Step 4: Home Screen / Functionality Page: After login, the user is directed to the home screen or functionality page.

- Step 4.1: Access Emergency Features
  - The user can click "SEND SOS ALERT" to send an immediate emergency alert with location details.
- Step 4.2: Real-Time Location Fetching
  - Click "FETCH LOCATION" to send the current GPS location to pre-set emergency contacts and authorities.

Step 5: Personalized Safety Tips: After fetching location, the user can click "SAFETY TIPS" to view a list of personalized safety tips and recommendations based on the user's location and environment.

Step 6: Emergency Response Options: In case of distress, the user can:

- Click "CALL EMERGENCY" to directly call emergency services.
- Voice-Activated Assistance: Speak to the app for assistance. The app uses AI to detect distress in the user's voice and automatically send alerts.

Step 7: View Emergency History and Notifications: The user can access "HISTORY" to view past alerts, location logs, and safety tips sent by the application.

Step 8: Logout: When finished, click on the "LOG OUT" button located at the top-right corner to log out from the application.

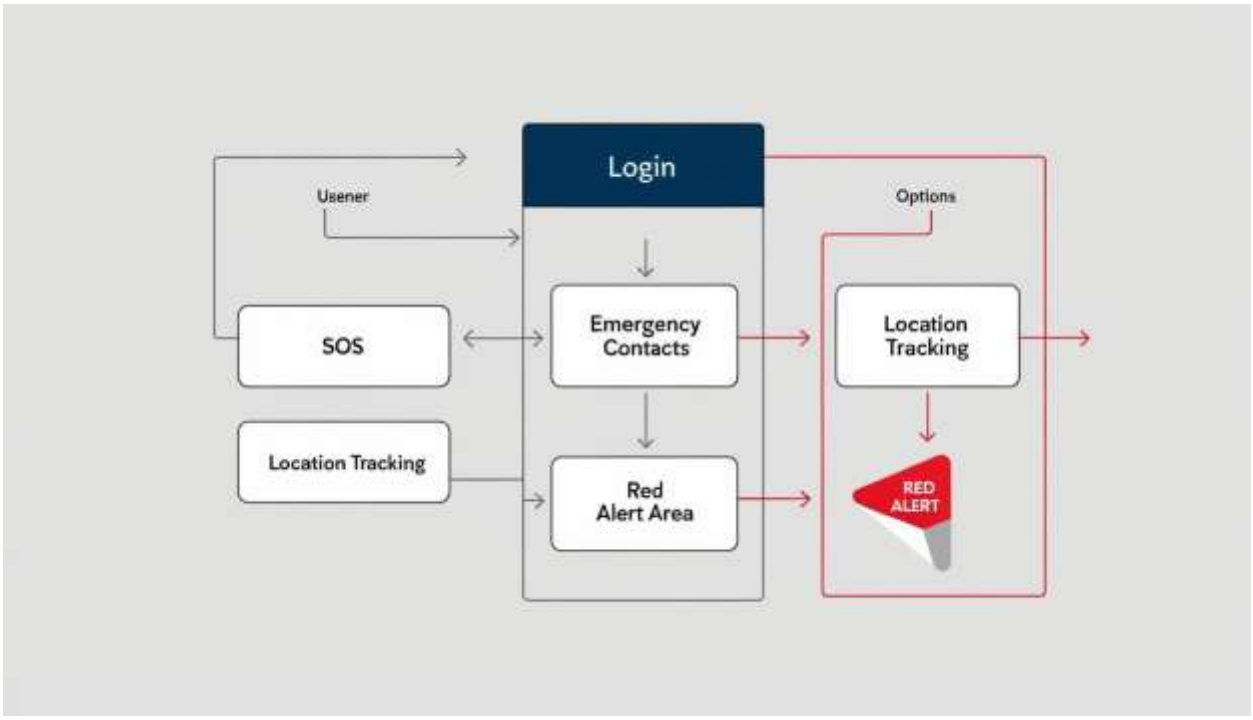

Figure 2: Sequence diagram 1

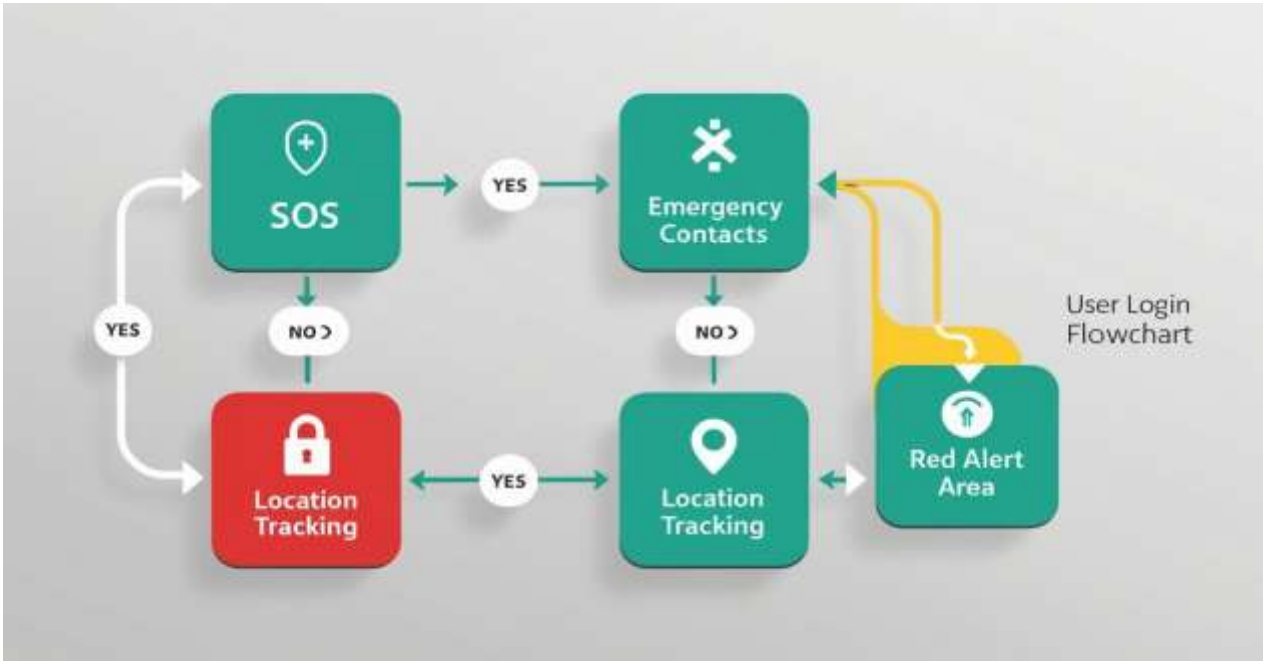

Figure 3: Sequence diagram 2

VII.SYSTEM ARCHITECTURE

A system design or systems design is the abstract model that defines the structure, behavior, and additional views of a system. Associate design description may be a formal description and illustration of a system, organized by a means that supports reasoning regarding the structures and behaviors of the system. The system architecture will include system parts, and therefore the subsystems developed that may work along to implement the general system.

VIII.CONCLUSION

Women's safety is still a major concern, with incidents of harassment, assault, and violence continuing to make headlines. Too many women live with the fear of not being safe, which can hold them back from living freely and confidently. Everyone deserves to feel secure, no matter where they are. *Nari Rakshak* is a step toward changing that.

By using AI-driven technology, it provides real-time protection, quick emergency response, and a sense of security that empowers women to navigate the world with confidence. But more than just a safety tool, it represents a vision—a future where women don't have to constantly worry about their security.

Real change, however, goes beyond technology. It requires continuous effort, awareness, and collective action. When communities, innovators, and policymakers work together, we can create lasting solutions and ensure that every woman feels safe, respected, and truly free.

While existing safety solutions provide basic emergency support, they often fall short in proactive threat detection, automation, and real-time intervention. *Nari Rakshak* aims to bridge these gaps by integrating AI, IoT, and biometric monitoring, creating a smarter and more reliable safety system for women.

IX.FUTURE SCOPE

Nari Rakshak has the potential to become much more than just a safety app—it can be a **trusted companion** that empowers women to feel safe and confident wherever they go. Looking ahead, some key advancements could include:

- **Smarter AI Protection** – AI that detects threats in real-time, predicts danger, and alerts emergency contacts instantly.
- **Wearable Safety Devices** – Panic buttons, smart bracelets, and voice-activated alerts for quick and discreet help.
- **Community Support Networks** – Volunteer-driven safety groups, real-time heat maps, and local resources for added security.
- **Greater Accessibility** – Multi-language support, offline functionality, and location-based assistance for women everywhere.
- **Proactive Crime Prevention** – AI-powered insights to identify high-risk areas and help prevent incidents before they happen.
- **Stronger Partnerships** – Collaborating with law enforcement, NGOs, and governments to create a more effective safety system.

By integrating these features, *Nari Rakshak* can move closer to its mission—**not just responding to danger, but actively preventing it**, making the world a safer place for women everywhere.

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