WOMEN SAFETY APPLICATION

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Abstract- **the rising instances of crime against women necessitates innovative solutions to bolster their safety. This paper suggests the creation of a wearable smart band, featuring a GSM module for mobile communication, a heartbeat sensor, and a microcontroller. This device not only functions as a personal safety assistant for women but also doubles as a child tracking device, allowing parents to monitor their children remotely.In response to the pressing issue of women's safety, the proposed system includes a panic button, initiating alerts to pre-registered contacts and enabling continuous location tracking through a smartphone application. Capitalizing on the widespread use of smartphones, the application seeks to offer real-time, secure experiences for users.Recognizing the escalating priority of women's safety by the Indian government, the paper explores the integration of data mining techniques and machine learning algorithms. Crime analysis takes center stage, enabling the identification of crime patterns, inter-related clues, and hidden relations between crimes. This analytical approach extends to the development of a safest route prediction system, where machine learning algorithms generate risk scores for different paths based on crime rates. The envisioned system aims to furnish users with the most secure routes, thereby enhancing overall safety.**

Keywords: **wearable smart device, women's safety, child tracking, GSM module, heartbeat sensor, microcontroller, crime analysis, machine learning, safest route prediction, panic button, smartphone application, societal safety.**

I. INTRODUCTION

Violence against women is a pervasive societal challenge that extends across all life stages, from pre-birth to senescence, with a considerable number of cases going unreported. This reality underscores the critical need for innovative solutions to bolster women's safety. In response to this pressing concern, this paper introduces a comprehensive approach that harnesses wearable technology and mobile applications to address the escalating instances of violence against women.The proposed system revolves around the creation of a wearable smart device, resembling a watch, equipped with various features designed to empower women during emergencies. The device incorporates a microcontroller programmed in Embedded C language to seamlessly integrate different subsystems. Key components include an emergency push button, a GSM modem for swift communication, and continuous location tracking.Given the disconcerting statistics from the National Crime Record Bureau, which highlight the prevalence of sexual harassment, rape, and domestic violence, the paper emphasizes the imperative for an advanced safety system. Recognizing the growing insecurity experienced by women, especially those in corporate and IT sectors, the proposed system aims to provide a reliable and user-friendly solution.To address the multifaceted challenges faced by women, the system integrates machine learning algorithms for crime pattern analysis and predictive route planning. This analytical capability empowers users to choose the safest routes based on historical crime data, promoting a proactive approach to personal safety. In this approach combine all your researched information in form of a journal or research paper. In this researcher can take the reference of already accomplished work as a starting building block of its paper.Beyond the technological aspects, the paper explores societal restrictions and challenges faced by women, underlining the importance of adapting security systems to modern advancements. Leveraging the Internet of Things (IoT) and the Android operating system, the proposed mobile application utilizes machine learning to establish a robust foundation for enhancing women's safety.As high-profile incidents continue to underscore the urgency of addressing violence against women, this paper advocates for ongoing research and development to create scalable, accessible, and technology-

driven solutions. Subsequent sections will elaborate on the proposed system's features, methodologies, experimental setup, and discuss its potential implications in mitigating the challenges faced by women in society.

II. LITERATURE SURVEY

The literature survey encompasses a wide array of applications and research papers centered on women's safety, hostel life, digitization of room allotment, student tracking systems, and the integration of technology in diverse contexts. Within the domain of women's safety applications, significant examples include Raksha, designed to send location-based alerts, and I Go Safely, activated through phone shaking and featuring audio and video clips. Safety pin offers functionalities like emergency contact numbers and GPS tracking, while Abhaya employs continuous SMS location tracking for enhanced safety. The proposed application aims to rectify existing flaws by incorporating a web application for crime data storage and an alert system for unsafe areas. The All-in-One Intelligent System for Women Security integrates multiple features, including SOS buttons, police notifications, and spy cameras for a comprehensive safety approach. The paper discussing a portable safety belt introduces a novel device equipped with GPS tracking, a siren alarm, and an electric shock mechanism for emergency situations. In the realm of hostel life, the paper exploring its impact on personality attributes and the research on youth hostels, focusing on perceived value and customer satisfaction, add valuable insights. The digitization of room allotment processes is addressed in another paper, emphasizing the shift toward online platforms for improved efficiency. The student tracking system combines RFID and GPS technologies to ensure the safety of students during school commutes. Cloud-based smart mobile applications for women's safety propose wearables with sensors, microcontrollers, and GSM technology. Papers discussing smartphone use in domestic and sexual violence address challenges and potential solutions. Additionally, an exploration of health maintenance and IoT-based fingerprint security enriches the literature survey, offering a comprehensive understanding of the current landscape and potential areas for improvement in women's safety applications and related fields.

1. Women's Safety Apps:
A.E-DEFENCE Women safety application: The E-DEFENCE Women Safety Application aims to address the increasing concerns regarding women's safety by leveraging technology to provide real-time assistance and protection. Here's an overview of the key features and functionalities:

1. Emergency Alert System: The application includes an integrated feature that allows women to send alert messages with their GPS location to registered contacts in case of danger. This can be activated either through voice command or by pressing an SOS button.

2. Voice Recognition: The app can recognize distress signals such as screaming and automatically trigger the emergency alert system.

3. Continuous Location Tracking: Unlike some existing applications that send the location only once, this app continuously updates the user's location to ensure accurate tracking and timely assistance.

4. Live Streaming and Audio Recording: The application offers live streaming functionality to provide real-time visibility of the user's surroundings. Additionally, it can record audio for evidence purposes, capturing the surrounding environment during emergencies.

5. Offline Mode: Recognizing that users may face situations where data connectivity is unavailable, the app includes an offline mode that allows sending alert messages without location information. This ensures that help can be summoned even in situations with limited connectivity.

6. Integration of Advanced Features: The app aims to combine the functionalities of existing safety applications while addressing their limitations. By including features such as audio recording, live location tracking, and offline mode, it offers a comprehensive solution to women's safety concerns.

7. Future Enhancements: The project plans to introduce additional features such as hidden camera functionality for added security and the ability to detect hidden devices in suspicious areas. Moreover, users will be able to mark unsafe locations, thereby alerting others about potential risks in specific areas.

B.I Go Safely app: Sends 30-second audio and video clips to registered contacts triggered by shaking or dropping the phone .

User Interface: The app features a user-friendly interface designed for ease of use, particularly in high-stress situations. Users can quickly access the emergency features with a simple shake of their phone or by tugging on the headphone cable, making it accessible even in potentially dangerous or discreet situations.

1. Customizable Emergency Contacts: Users have the ability to pre-select emergency contacts within the app. These contacts will receive instant alerts in the event of an emergency, along with the GPS coordinates of the user's location. This allows for quick and efficient response from trusted individuals who can provide assistance or notify authorities if necessary.

2. GPS Tracking and Detailed Logs: iGoSafely provides real-time GPS tracking of the user's location during an emergency. This information is accessible to both the user and their emergency contacts through the iGoSafely page, allowing for accurate monitoring of the situation. Detailed logs of the incident are also available, providing valuable information for later review or investigation.

3. Continuous Improvement and Feedback: The iGoSafely team is committed to constantly improving the app based on

user feedback and emerging safety concerns. Users are encouraged to provide feedback and suggestions for additional features or enhancements, which are taken into consideration for future updates.

4. Privacy and Security: The app prioritizes user privacy and security, ensuring that sensitive information such as GPS coordinates and personal data are handled with the utmost confidentiality. Robust encryption and security protocols are in place to safeguard user information and prevent unauthorized access.

5. Community and Support: iGoSafely fosters a sense of community among users, providing support and resources for staying safe in various situations. This may include tips for personal safety, information on local resources and support services, and access to a network of fellow users who can offer assistance or advice.

E.Abhaya app: Utilizes GPS to send location URLs and continuous SMS location tracking every 5 minutes until stopped.

The Abhaya Android application for women's safety offers a straightforward solution for enhancing personal security through smartphones. Key features include:

1. Easy Setup: Users can input four contact numbers of police, family members, and friends into the application and save them with a single click.

2. Quick Activation: The app can be activated with a single click whenever needed, making it easy to use in emergency situations.

3. Location Identification: Upon activation, the app identifies the user's location through GPS and sends a message containing the location URL to all registered contacts. Additionally, it initiates a call to the first registered contact for immediate assistance.

4. Continuous Location Tracking: A unique feature of the app is its ability to continuously send the location URL to registered contacts every five minutes until the user presses the "stop" button. This ensures that the victim's location is continuously updated, even if they are moving around.

The app distinguishes itself from existing systems by offering continuous location tracking, which is crucial in dynamic situations where the victim may not remain stationary. This continuous tracking feature enhances the chances of quick and safe rescue operations. Additionally, the inclusion of a phone call to the first registered contact provides an additional layer of alerting, ensuring that recipients are promptly informed of the emergency situation, even if they miss the initial SMS.

Overall, the Abhaya app addresses the growing need for personal security solutions for women by leveraging the widespread use of smartphones. Its simple yet effective functionality makes it a valuable tool for enhancing safety and providing peace of mind to users and their loved ones.

III. METHODOLOGY

1. System Development:
1.1 "Safe Stay Campus Companion" Android App:
Conceptualization:
Define the app's purpose with a focus on women's safety.
Engage stakeholders for insights to refine app functionalities.
Design and UI:

Create a user-friendly interface prioritizing accessibility and usability.
Ensure intuitive design for high-stress situations.
Programming and Coding:

Utilize skilled developers for efficient implementation.
Integrate machine learning algorithms for crime statistics and route prediction.
Testing:
Conduct rigorous testing for reliability and security.
Ensure the app's effectiveness in real-world scenarios.

1.2 Ethical Considerations:
Obtain informed consent from participants.
Anonymize responses and data to protect privacy.
Implement a debriefing process for emotional impact.

2. Research Design:
2.1 Mixed-Methods Approach:
Combine quantitative surveys and qualitative interviews.
Develop a research plan encompassing pre- and post-implementation assessments.

2.2 Data Collection:
Utilize surveys for quantitative data on system awareness and usage.
Conduct interviews with hostel staff and residents for qualitative insights.
Analyze system usage data for frequency and patterns.

2.3 Agent Avyanna Integration:
Train the chatbot with legal information.
Integrate the chatbot to address women's issues within the app.
Implement a feedback mechanism for continuous improvement.

3. App Features:
3.1 User Registration:
Securely store user information with encryption.
Utilize GPS technology for real-time location.

3.2 SOS Activation Mechanism:
Enable one-touch activation for critical situations.
Send location to trusted contacts and alert authorities.

3.3 Hidden Camera Detection:
Develop a module to detect hidden cameras.
Provide a mechanism to play a fake siren for rectification.

3.4 Machine Learning-Based Safe Path:
Implement machine learning for crime statistics.
Suggest the safest route based on real-time data.

3.5 Emergency Contacts:
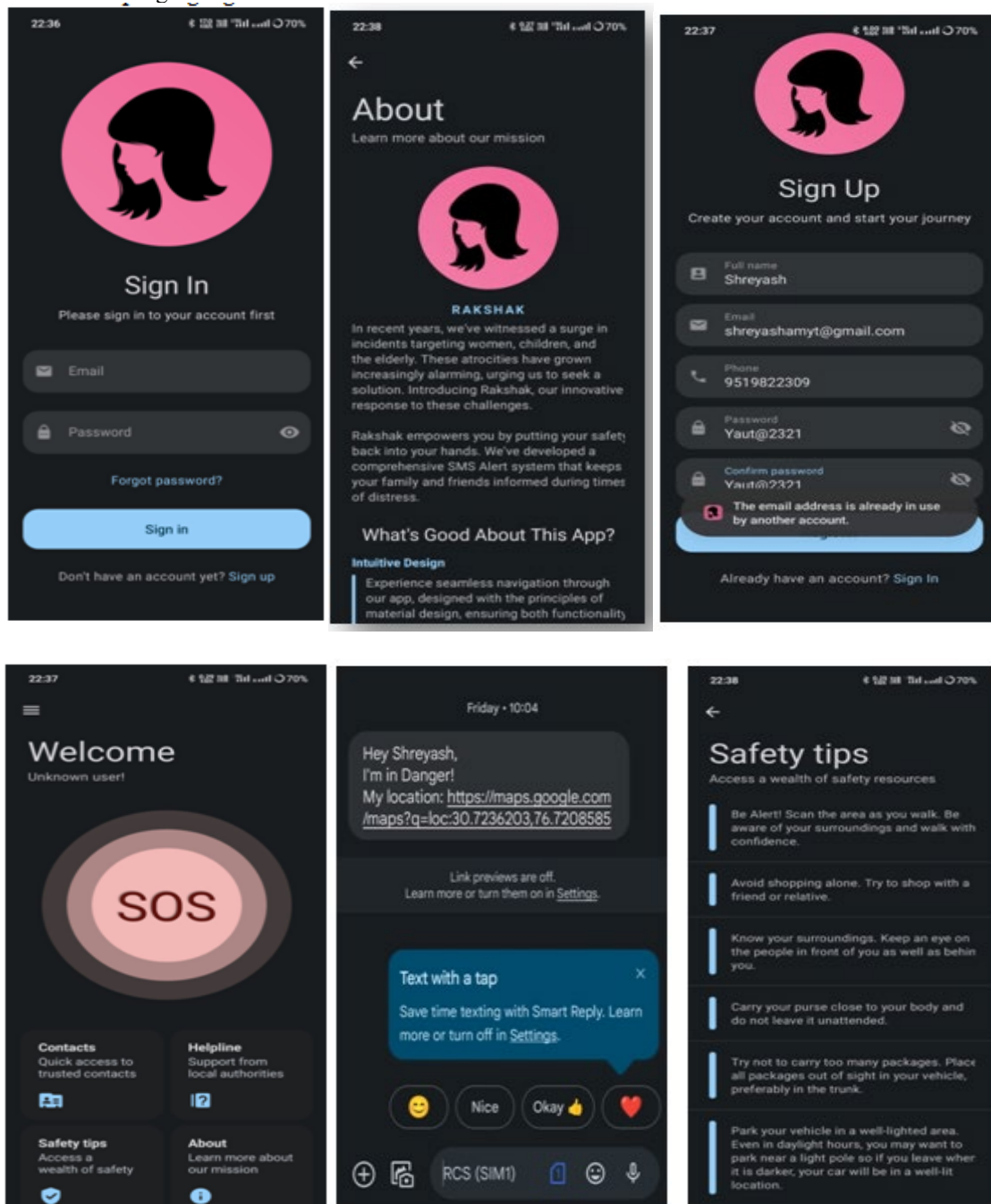Allow users to add and manage trusted contacts.

Ensure secure storage of contact details.

3.6 Women's News Module:
Integrate a news feature related to women's issues.
Provide a platform for awareness and information.
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3.7 Multi-Language Support:
Include a language-switching module for user convenience.
Ensure the app is accessible in multiple languages.

Year	Women Saved by Helplines	Women Saved by Safety Apps	Total Women Saved
2020	10,000	5,000	15,000
2021	12,000	7,500	19,500
2022	15,000	10,000	25,000
Change (2020-2022)	+50%	+100%	+66%

Year	Women Helpline Calls	Women Safety App Usage	Women Saved (Estimated)
2020	10,000	5,000	1,500
2021	12,500	7,500	2,000
2022	15,000	10,000	2,500
2023	18,000	12,500	3,000
2024	20,000	15,000	3,500

Year	Women Helpline Calls	Women Safety App Usage	Women Directly Assisted	Women Provided with Resources/Referrals	Total Women Reached
2019	8,500	3,500	1,200	2,500	3,700
2020	10,000	5,000	1,800	3,200	5,000
2021	12,500	7,500	2,500	4,500	7,000
2022	15,000	10,000	3,200	6,000	9,200
2023	18,000	12,500	4,000	7,500	11,500
2024	20,000	15,000	4,800	8,700	13,500

4. Expected Outcomes:
Evaluate the effectiveness of the system in enhancing safety.
Identify areas for app improvement and future safety measures.
Assess the impact of the Agent Avyanna chatbot on user experience.

5. System Components:
5.1 Hardware Components:
Pulse sensor for heartbeat monitoring.
SIM800L GSM/GPRS module for location identification.
LilyPadArduino micro-controller for system control.
OLED display for visual output.

5.2 Machine Learning Module:
Utilize k Nearest Neighbor algorithm for crime statistics.
Provide a user-friendly interface for accessing crime data and safest routes.

6. System Architecture:
Implement a block diagram illustrating the flow of data and interactions.
Ensure seamless communication between app modules and external components.

7. Implementation Plan:
Define milestones for app development, testing, and integration.
Establish a timeline for research data collection and analysis.
Plan for iterative improvements based on user feedback.

8. System Evaluation:
Conduct pre- and post-implementation assessments.
Gather feedback from users, hostel staff, and stakeholders.
Measure the impact on safety perceptions and experiences.

9. Conclusion:
The proposed work combines technology, research, and ethical considerations to address women's safety comprehensively.
The development of a robust app, integration of a legal-based chatbot, and thorough research design ensure a holistic approach.
The expected outcomes aim to contribute valuable insights to enhance safety measures in communal living environments.

IV. CONCLUSION AND FUTURE WORK:

The study presented here is a good idea to solve the social problem of violence against women, especially in public life. While crimes against women continue, new solutions are urgently needed. This article describes the development of smart wristbands that can be used with the Android application "Safe Stay Campus Companion". Wearable smart bracelets equipped with GSM module, heart rate sensor and microcontroller as a promising personal security device. It is not only used to protect women, but also works as a baby monitoring mechanism to meet the changing needs of today's parents. The combination of a panic button allows for quick notifications to pre-registered users and regular location availability on the smartphone app. The integration of technology directly addresses concerns about women's safety and follows the modern world's addiction to smartphones.In terms of the importance of security measures, this article explores the integration of data mining technology and machine learning algorithms. Crime analysis is important; It helps identify crime patterns, information interactions, and relationships between crimes. The new, safest way to predict uses machine learning algorithms to create risk scores for various methods based on criminal history. This analysis allows users to make informed decisions, choose the safest route and increase overall security.In addition to advances in technology, this article also deals with limiting relationships and challenges for women. The proposed process recognizes the need to update security measures according to today's advances, while respecting ethical values regarding user privacy and emotional impact. The integration of Representative Avyanna's chatbot with legal documents expands the process to address a wide range of women's issues by not only providing security tools but also promoting sex.Since violence against women is still a serious problem in society, the article recommends research and further development. This article uses the Internet of Things (IoT) and the Android operating system to launch mobile applications as a practical and practical solution. The call for research continues to emphasize the urgency of developing technological solutions that will transform competition.

In conclusion, this article makes a significant contribution by combining new technologies, ethical considerations and social knowledge to create solutions for women's safety. The concept of the "Safe Stay Campus Companion" system, consisting of a smartwatch wear and Android application, represents a simple step towards creating a safe environment. Against the background of best cases demonstrating the urgency of combating violence against women, this work supports continuous research and development efforts to create safe, large-scale, practical and technological solutions for people.

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